ARCADIS Design & Consultancy for natural and built assets

WHITE PAPER

Arcadis:

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Jeff Gillow

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October 29, 2018

HOMESTAKE MINING COMPANY OF CALIFORNIA

Grants Reclamation Project

HOMESTAKE

Evaluation of Water Quality in Regard to Site Background Standards at the Grants Reclamation Project

September 2018

90042405

Meeting Agenda

- Introductions, safety share
- Meeting Objectives
- Overview of White Paper

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Seasonal slips, trips, and falls

Wet leaves

- Reduce traction while walking, biking, and driving

Dry leaves

- Reduce traction
- Obscure walking/biking/ driving surface

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HMC Grants Mill site

San Mateo Creek Basin Geology

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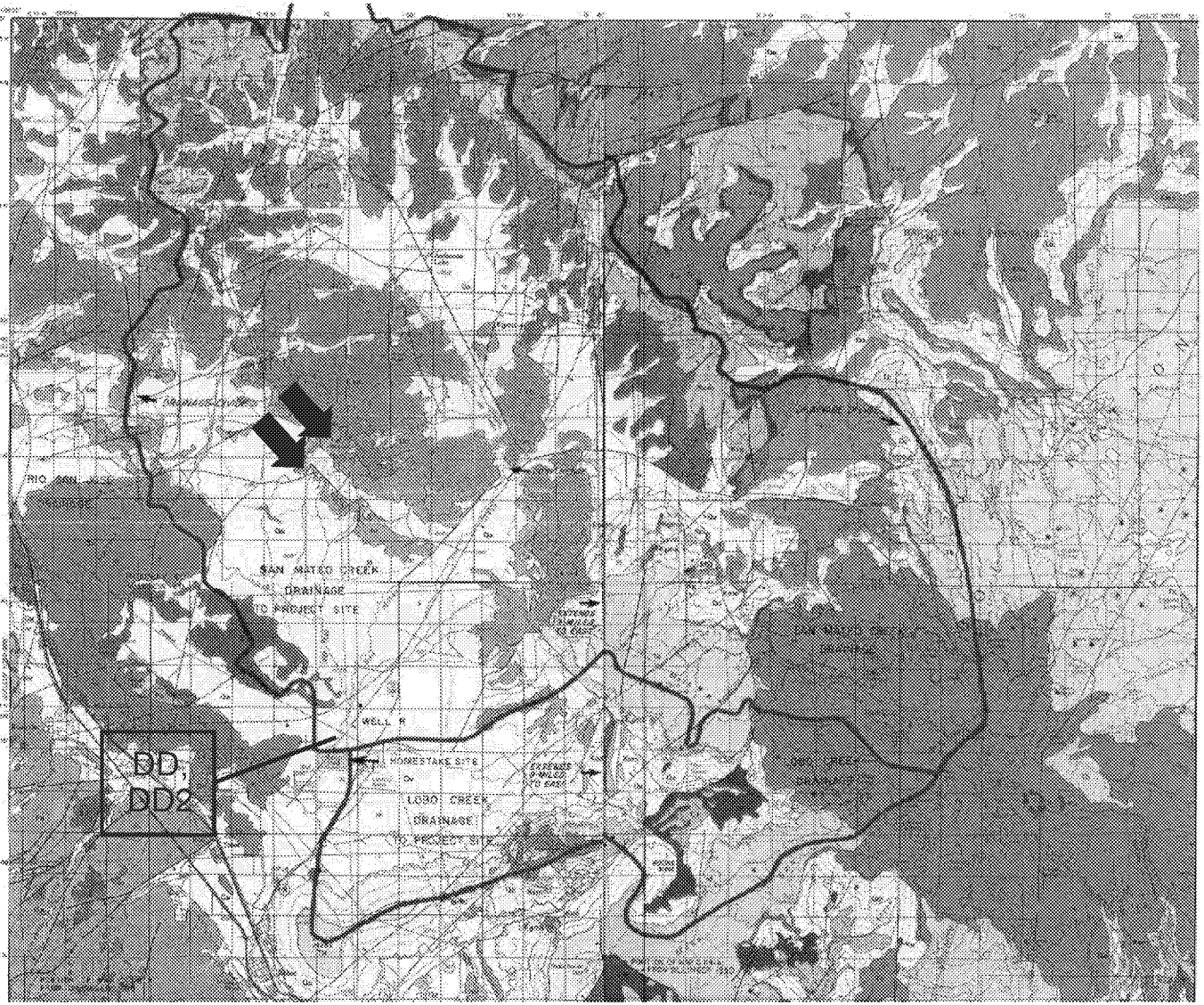
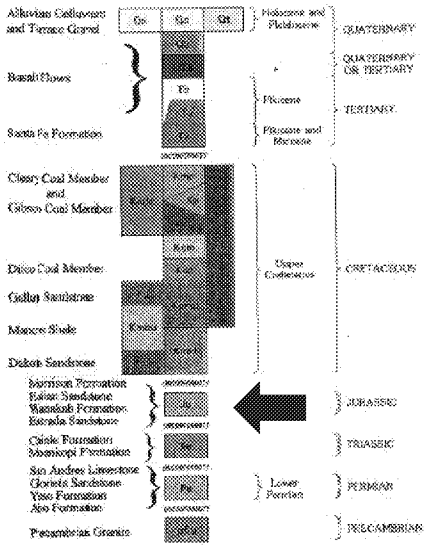


LEGENDS: Correlation of Map Units



Source:
Dillinger, J.K., 1990, Geologic map of the Grants 30' x 60' quadrangle, west-central New Mexico: U.S. Geological Survey, Coal Investigation Map C-118-A, scale 1:100,000.

GRANTS RECLAMATION PROJECT
Updated Corrective Action Program (CAP)

FIGURE 3.1-1
BEDROCK GEOLOGY

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San Mateo Creek Basin Geology

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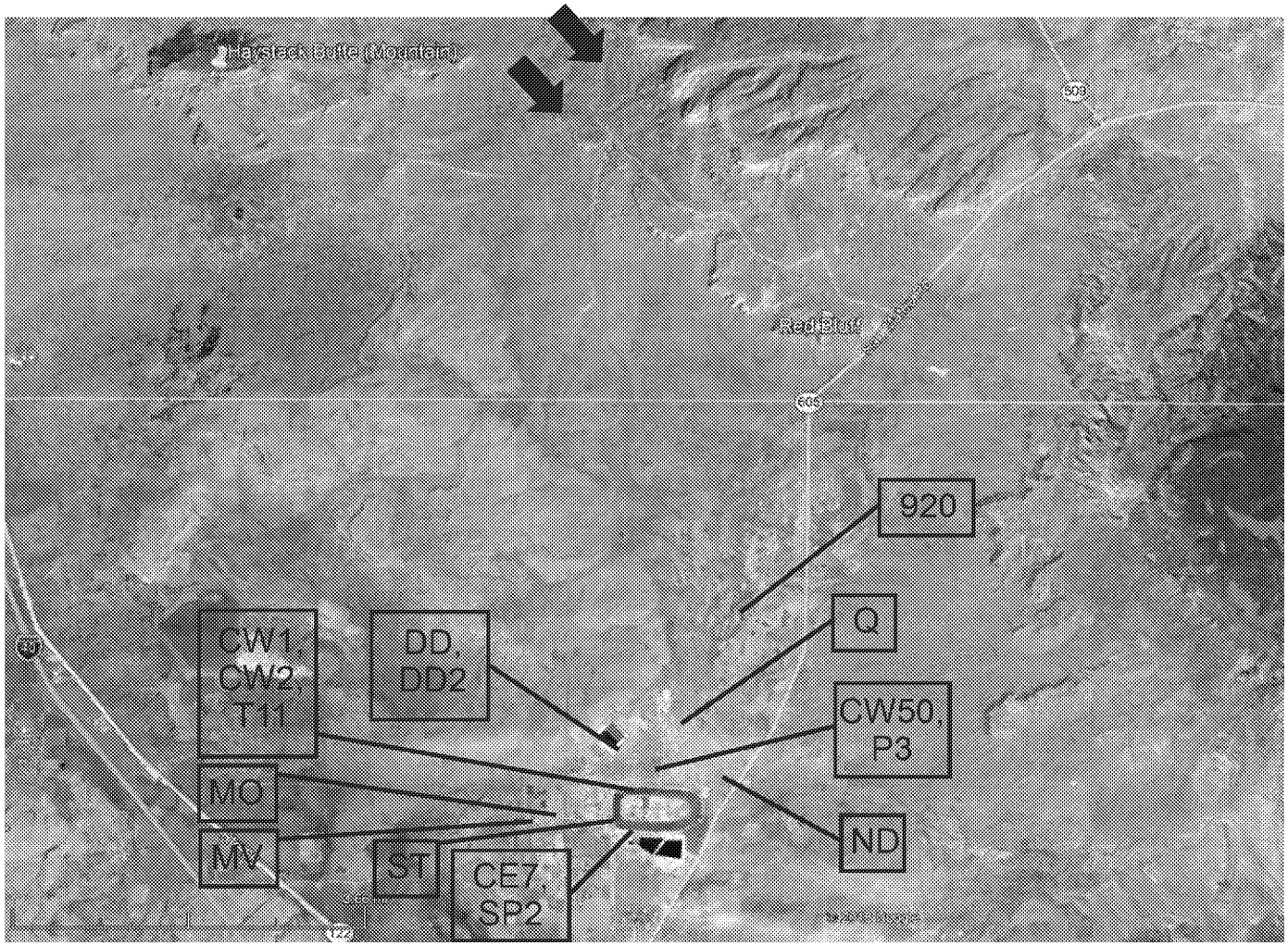
Alluvium is from eroded highlands

This rock contains ore-grade uranium

Results in disseminated uranium-containing particles in alluvium

Erosion/fluvial deposition is a heterogeneous process (visible)



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Split sampling event: Summer 2016

Sulfate S and O Isotopes

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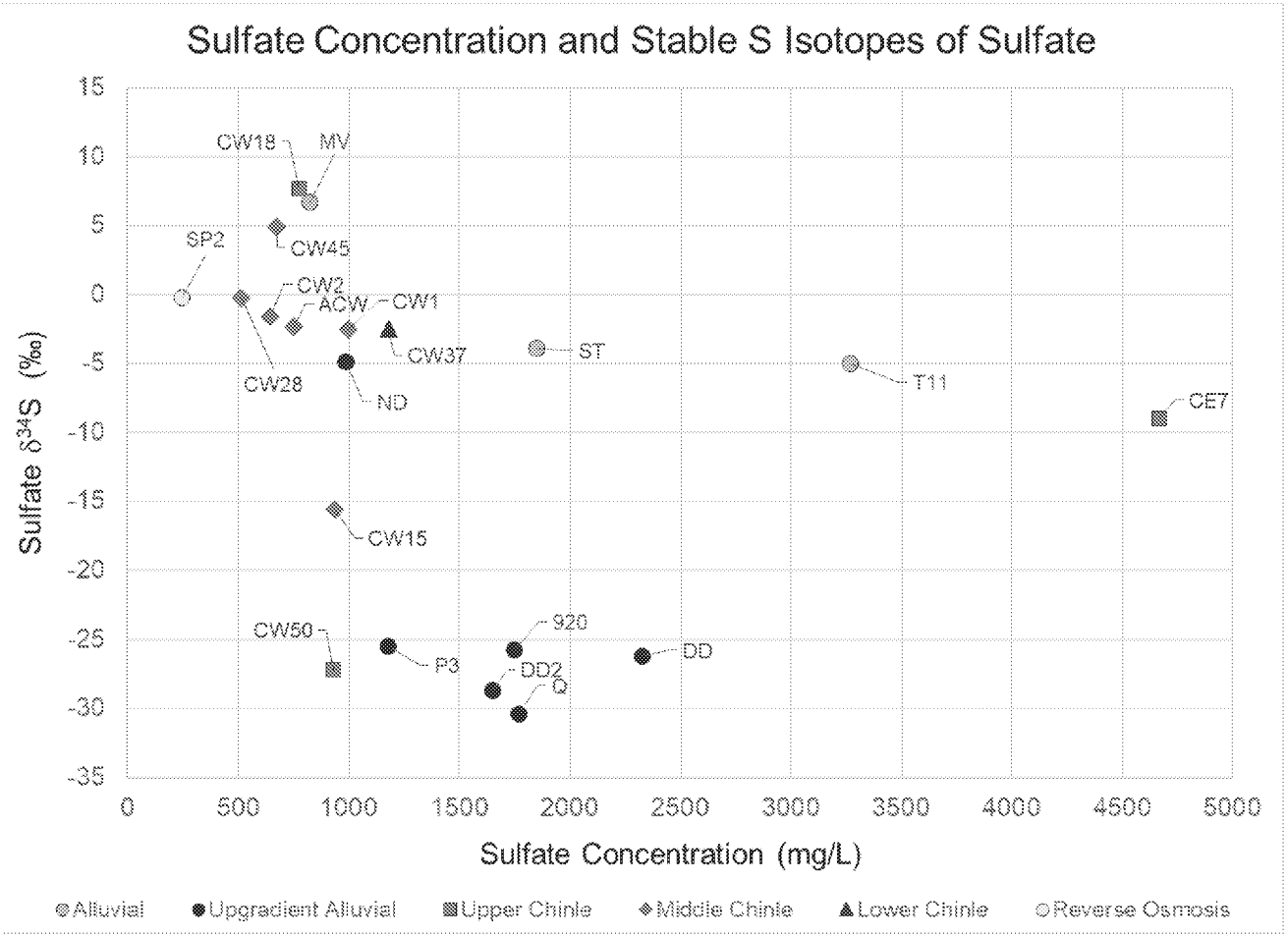
- Stable sulfur isotopes suggest pyrite oxidation is primary sulfate source.
- Samples with lower sulfate concentrations and more positive $\delta^{34}S$ values suggest sulfate derived from combination of pyrite oxidation and gypsum dissolution.
- Use of sulfuric acid in U ore processing ($\delta^{34}S$ ~ -8 to 32‰) may account for the higher sulfate concentration and heavier isotope signature from mills/tailings



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Sulfate S and O Isotopes

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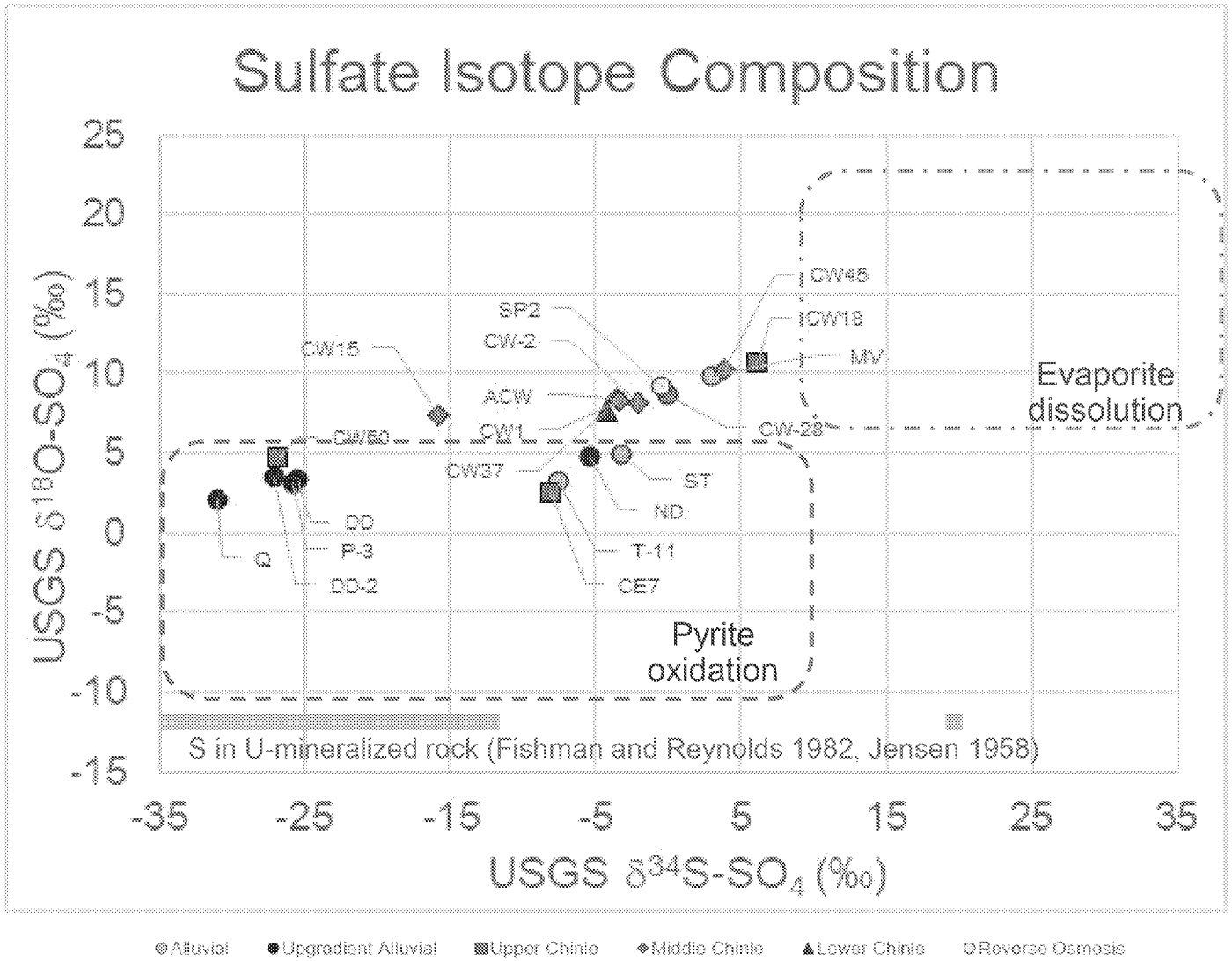
- Region contains naturally-occurring sulfide minerals (pyrite) in U-mineralized rocks and U-mineralized sediment present in alluvial aquifer
- Oxidation of S from sulfide minerals results in sulfate formation
- The greatest negative signatures come from areas that experience cycles of sulfide formation/oxidation



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Massive collection of iron oxide pseudomorphs of pyrite framboids

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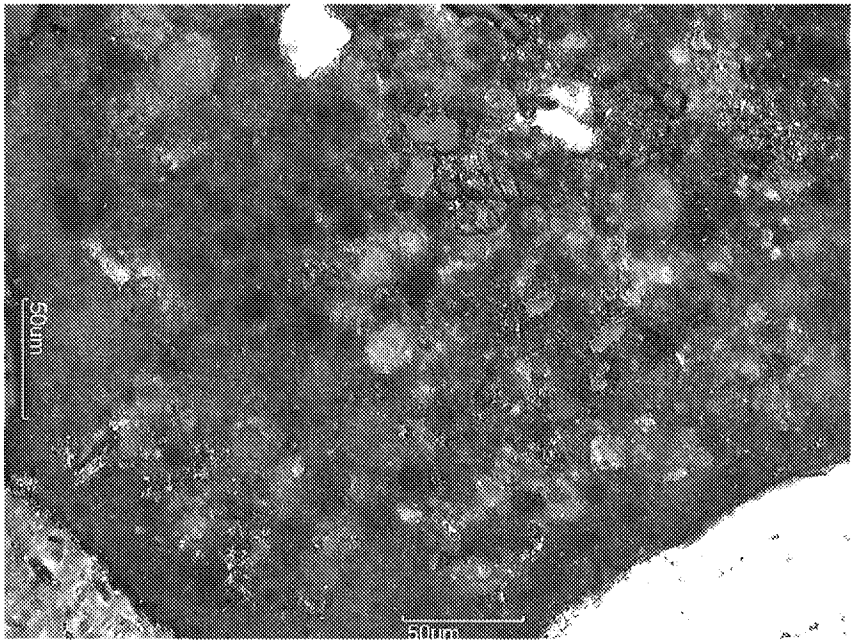
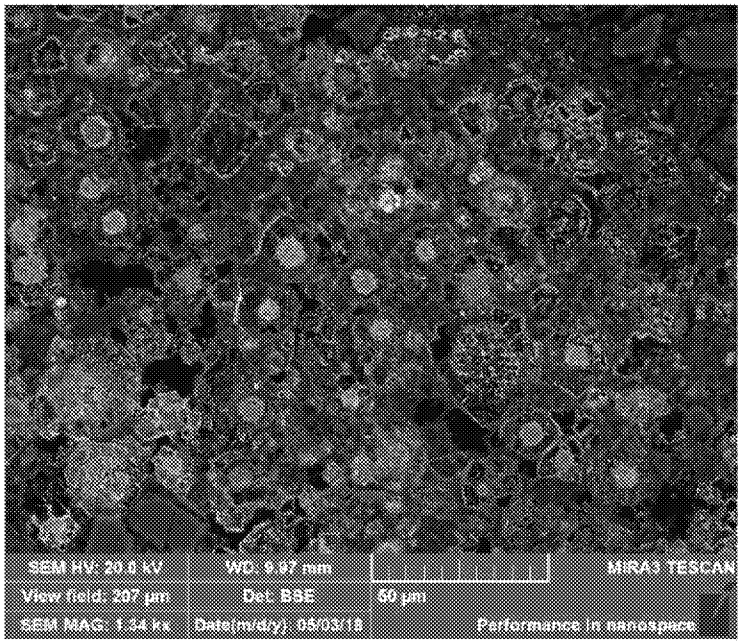


Client Sample No.: **DD2-BK-25-26-012218**

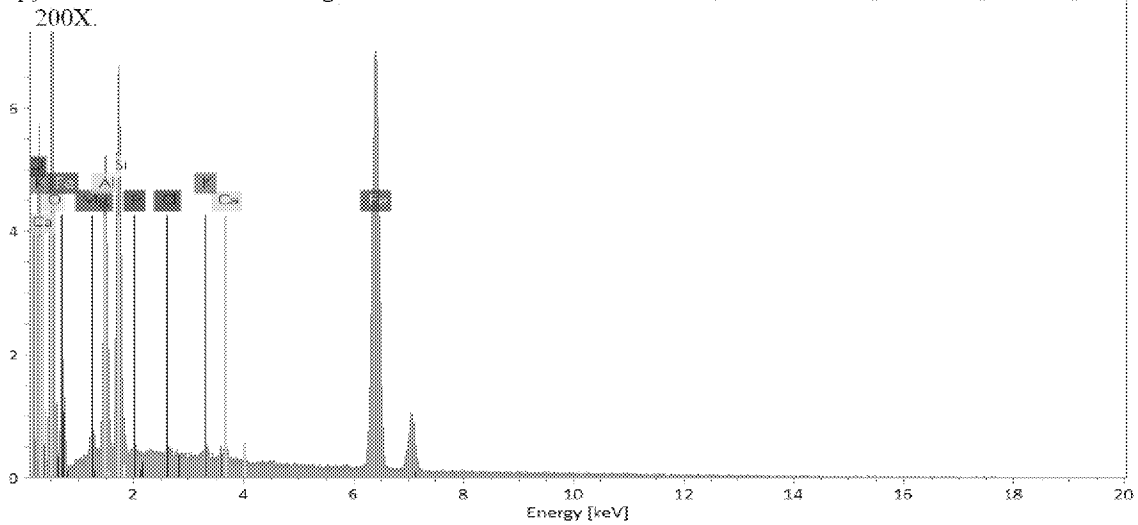
Iron oxide pseudomorphs after pyrite and pyrite framboids. Reflected light crossed Nichols – 200X.



Client Sample No.: **DD2-BK-25-26-012218**

Backscatter image of iron oxide pseudomorphs after pyrite cubes and framboids – 1,340X.

- Unsaturated zone
- Massive/ lithic



Notes
µm – microns
BSE – backscatter electron detector
cps/eV – count per second per electron volt
HV – high voltage
keV - kiloelectronvolt
kx – thousand times magnification
kV – kilovolts
m/d/y – month/day/year
mm – millimeters
WD – working distance
X – times magnified

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Soil chemistry, mineralogy, and geophysics at DD-BK and DD2-BK

Location of boreholes

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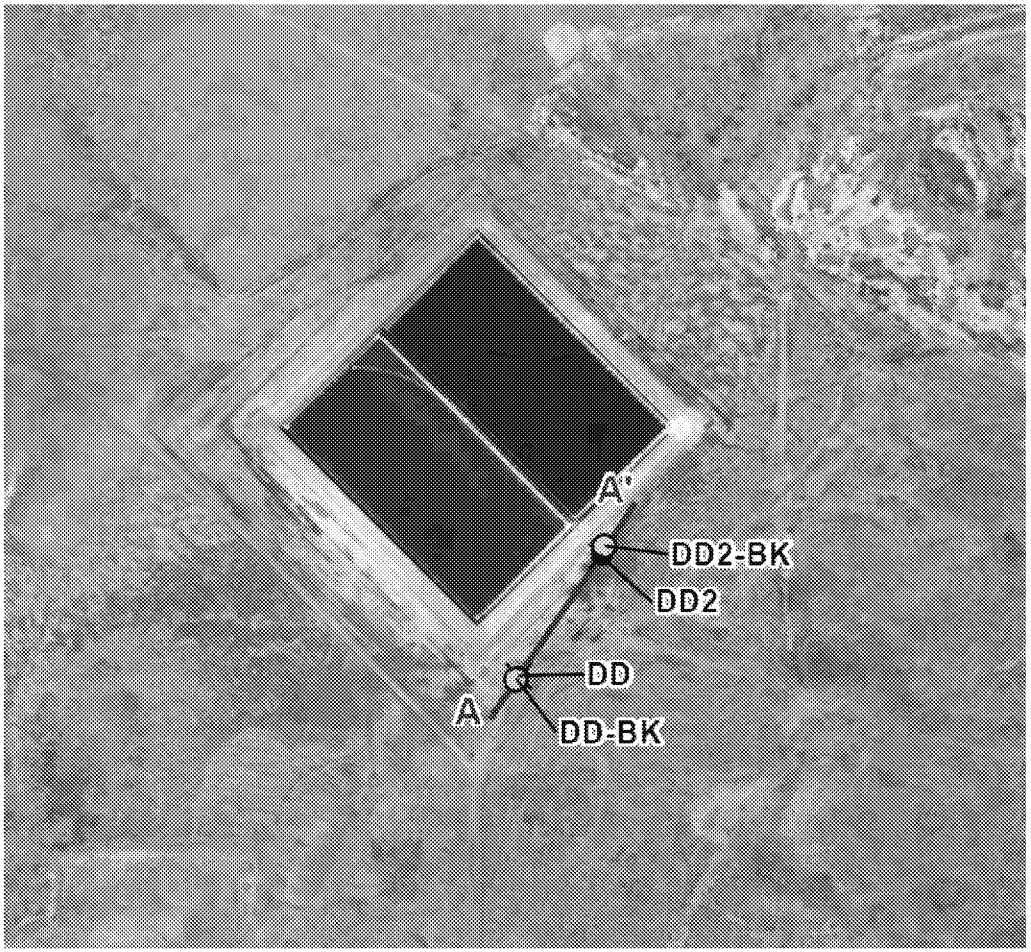

- Previous logging by driller, not geologist, with a mud rotary rig
  - Poor sample quality, very little sample visibility, low-resolution core-logging
- This event = high resolution logging, sonic rig
- Revised cross section for this area
- Alternating sands/silts/clays over shale
- Consistent with fluvial deposition of eroded grains from nearby source
- Sub-angular to sub-rounded grains: sediments transported, but not very far

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Samples with elevated uranium

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Sample ID	Alluvium zone	Total uranium concentration (mg/kg)	Alkaline SPLP leached uranium (mg/L)	Field-logged lithology	ACZ Particle Size Analysis Lithology	DCM analysis
DD2-BK-11-12-012218	unsaturated	10	0.179	CLAY	Clay	Yes
DD2-BK-71-72-012318	saturated	5	0.0305	Gravely SAND with silt	Sand	Yes
DD2-BK-51-52-012318	saturated	2	0.0086	Silty SAND	—	Yes
DD2-BK-60-61-012618	saturated	2	0.0086	CLAY with trace sand	—	Yes
DD2-BK-25-26-012218	unsaturated	1	0.0477	SAND with trace silt	Sand	Yes
DD2-BK-56-57-012318	saturated	1	0.0079	Silty SAND	—	No
DD2-BK-65-66-012318	saturated	1	0.0080	Sandy SILT	—	No
DD2-BK-67-68-012618	saturated	1	0.0180	CLAY	—	No
DD-BK-36-37-012518	unsaturated	1	0.0127	CLAY	Clay	Yes
DD-BK-58-59-012618	saturated	1	0.0032	CLAY	—	Yes
DD-BK-9-10-012518	unsaturated	1	0.0022	CLAY with trace sand	Clay	Yes

19 samples (excluding duplicate) were analyzed by ELI, only those with detectable total uranium concentrations are shown in the table

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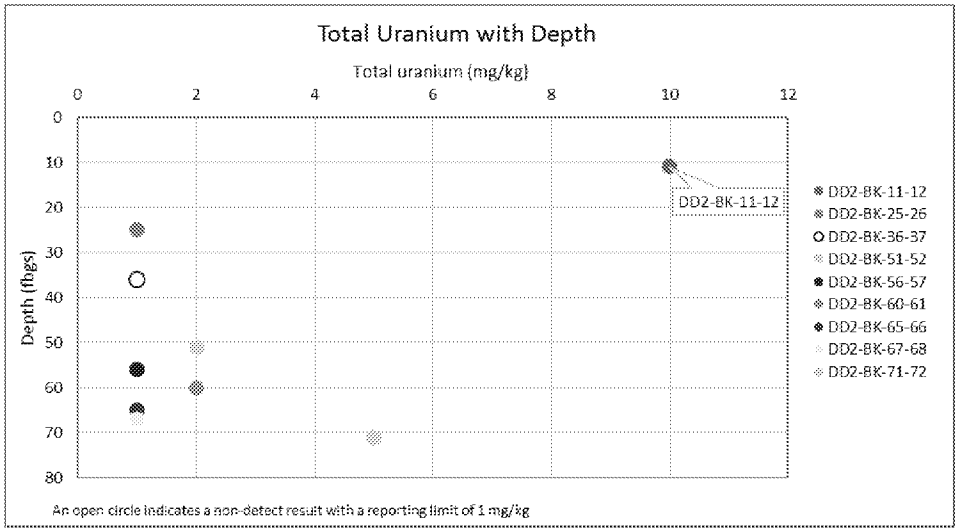
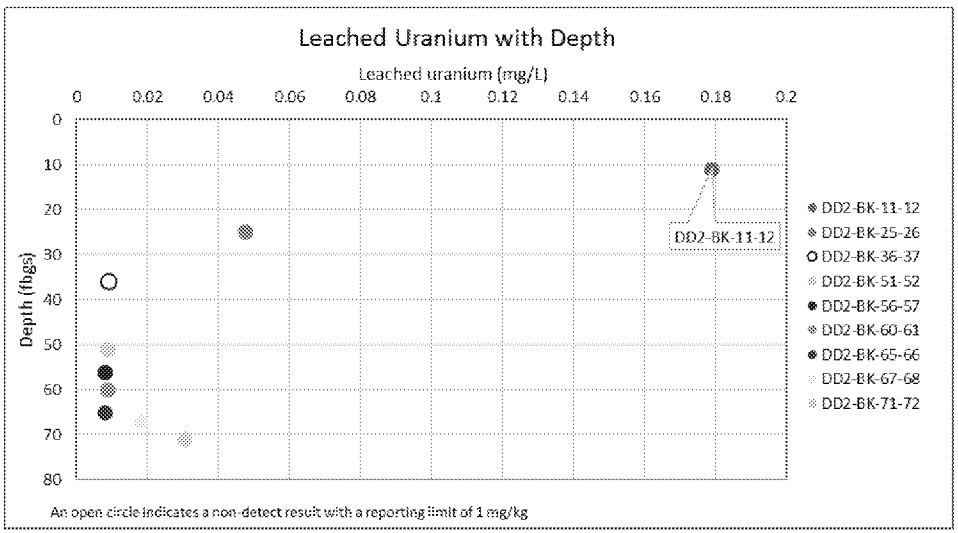
DD2-BK-11-12-012218

- Total uranium concentration: 10 mg/kg
- Alkaline SPLP leached uranium: 0.179 mg/L
- Lithology: Clay





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Soil chemistry – total metals

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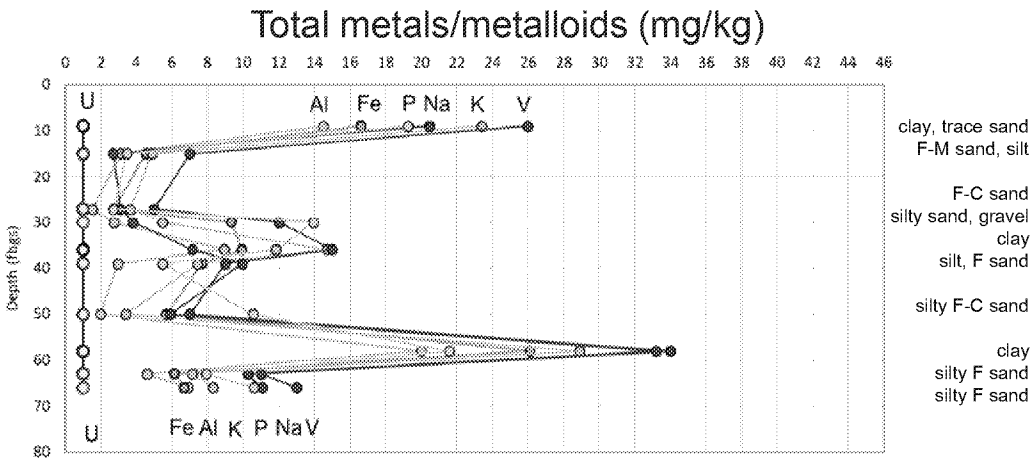
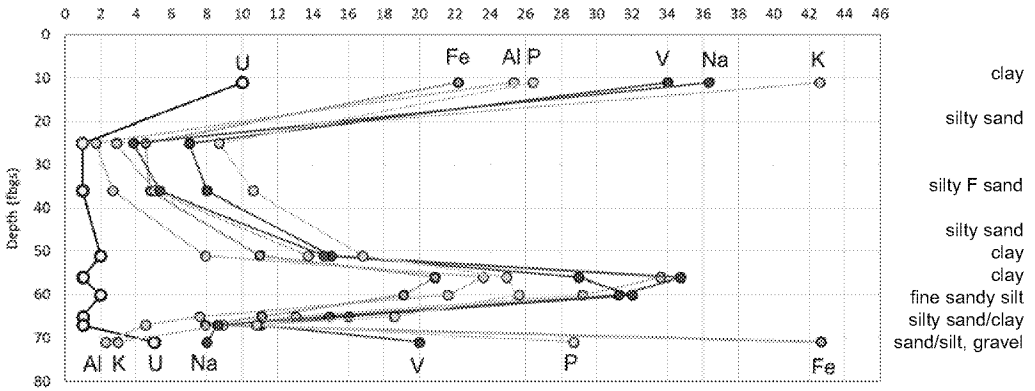
DD-BK



DD2-BK



Red circle = non-detect; reporting limit shown
Total Al and Fe/1000; K/100; Na, P/20

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Soil chemistry – total metals and leaching

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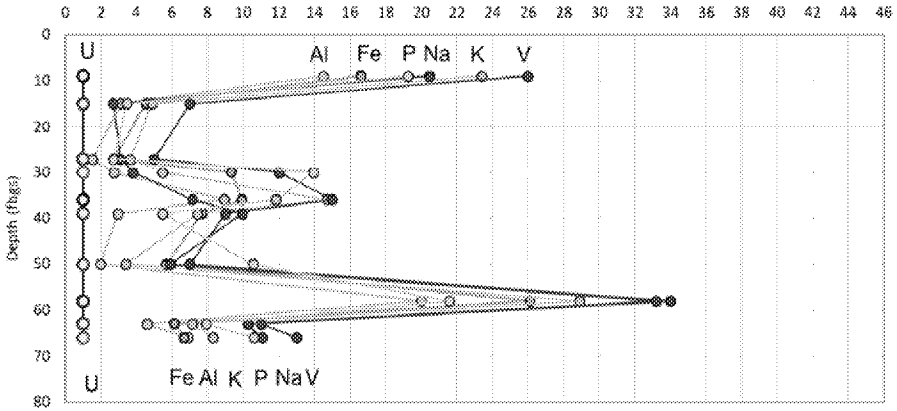
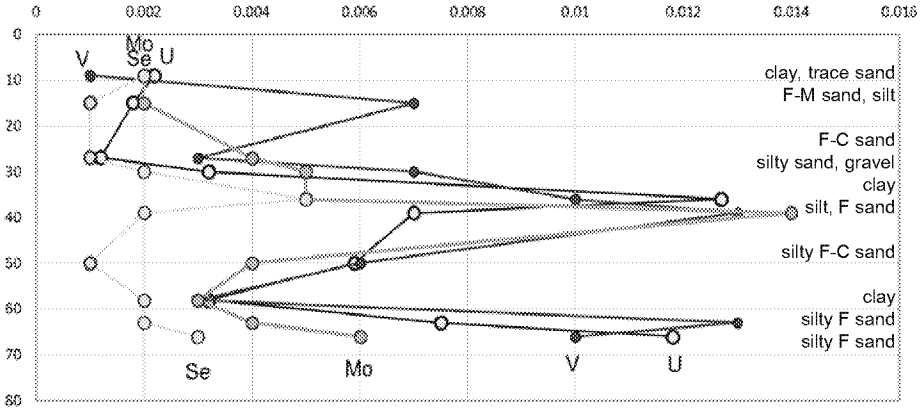
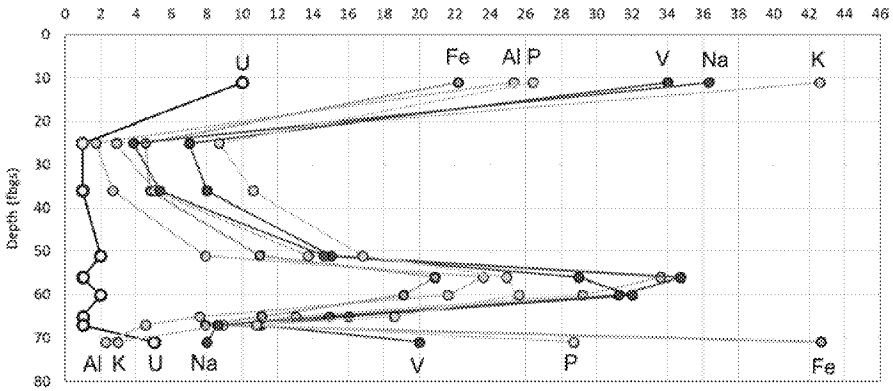
Leached in an alkaline (simulated groundwater) extraction

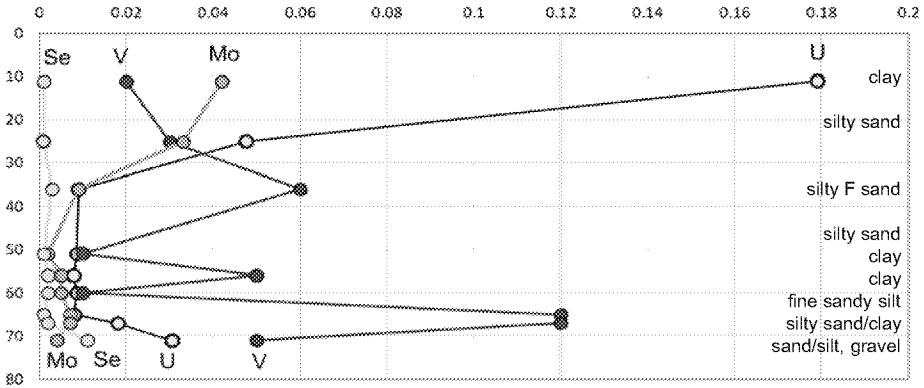
DD-BK





DD2-BK





Red circle = non-detect; reporting limit shown
Total Al and Fe/1000; K/100; Na, P/20

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Iron oxide pseudomorphs of pyrite framboids

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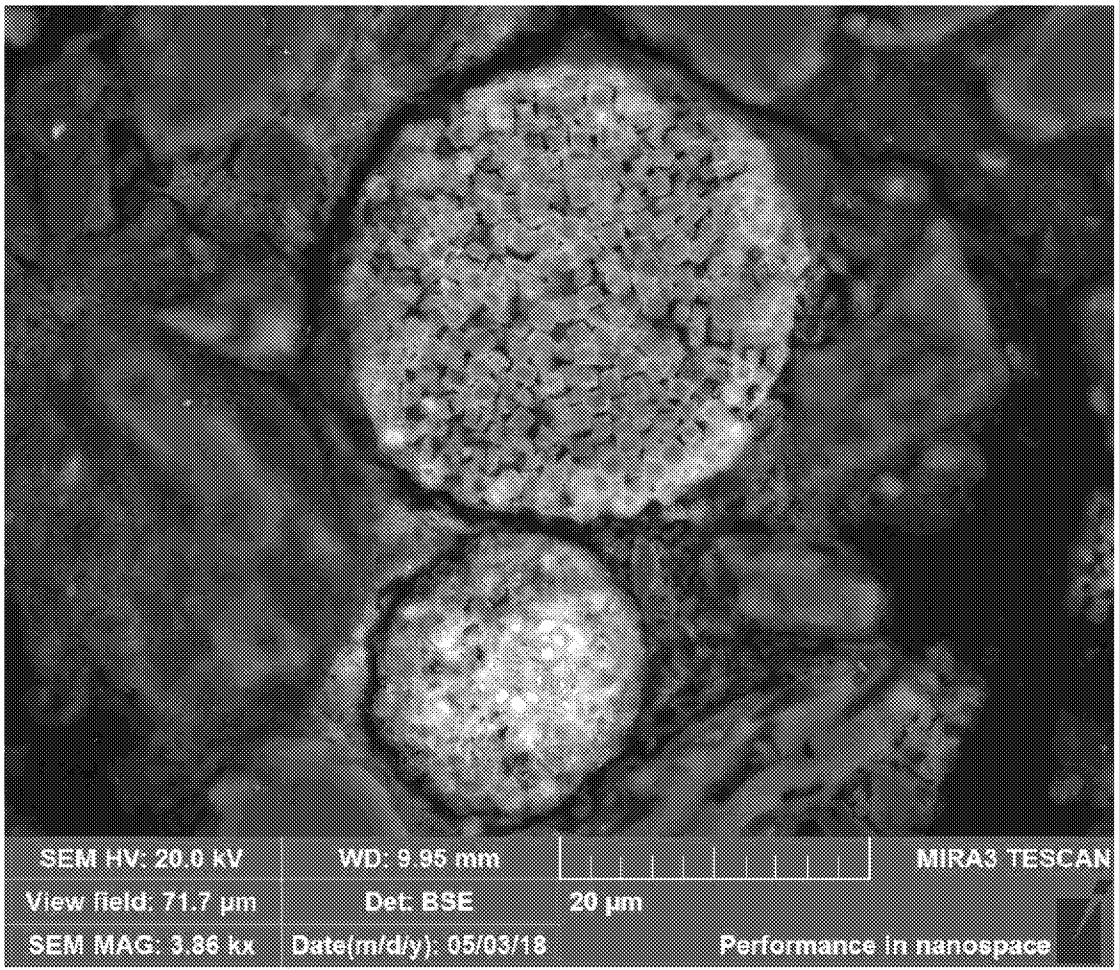

Notes
µm – microns
BSE – backscatter electron detector
HV – high voltage
kx – thousand times magnification
kV – kilovolts
m/d/y – month/day/year
mm – millimeters
WD – working distance
X – times magnified

Client Sample No.: **DD2-BK-51-52-012318**

Backscatter image of iron oxide pseudomorphs after pyrite framboids sit in a matrix of clay with quartz/feldspar grains. The smaller pseudomorph contains bright relict pyrite – 3,860X.

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Massive collection of iron oxide pseudomorphs of pyrite framboids

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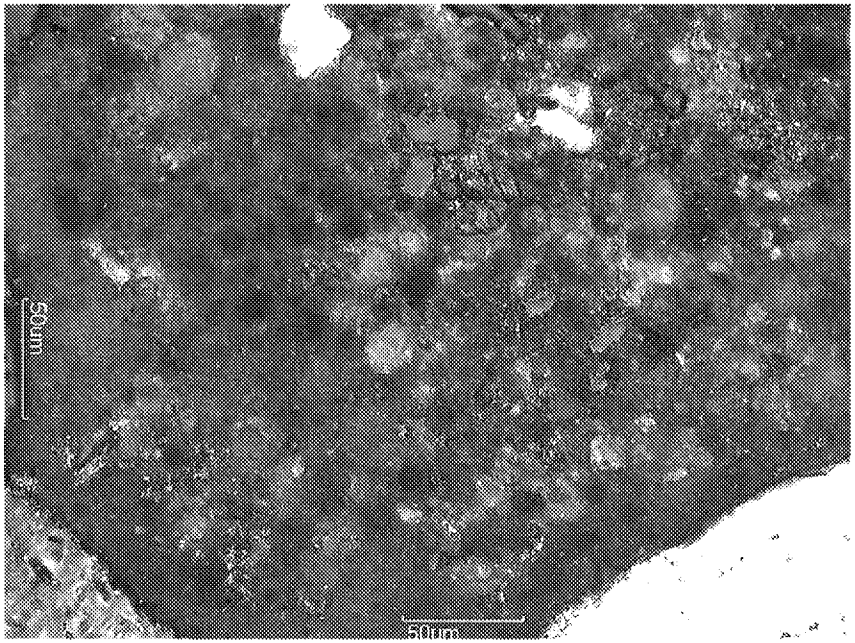

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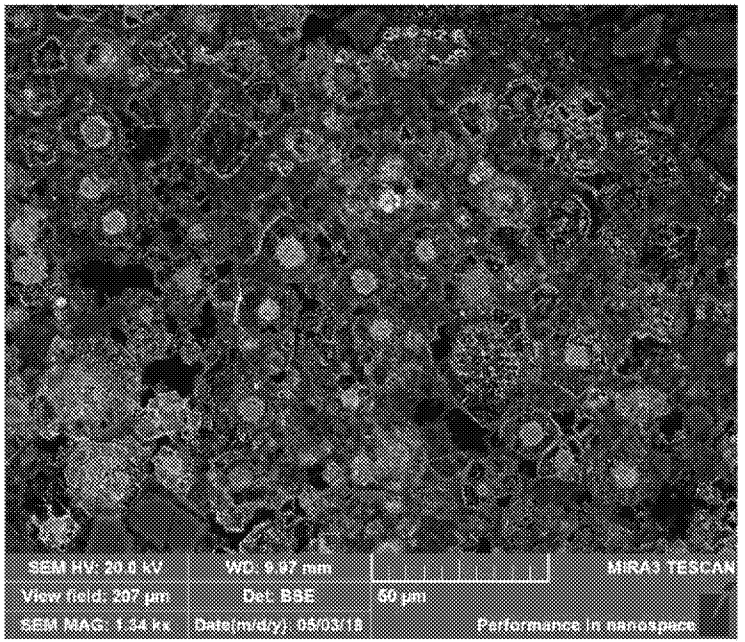
Iron oxide pseudomorphs after pyrite and pyrite framboids. Reflected light crossed Nichols – 200X.



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Backscatter image of iron oxide pseudomorphs after pyrite cubes and framboids – 1,340X.

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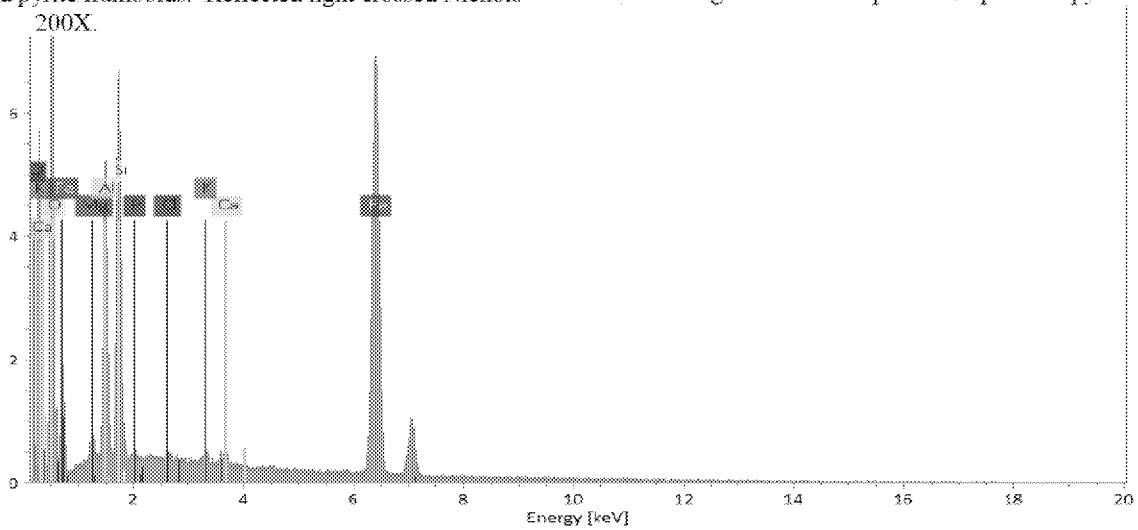

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m/d/y – month/day/year
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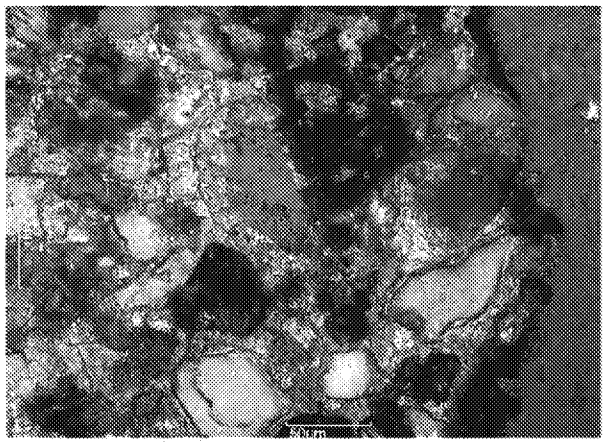
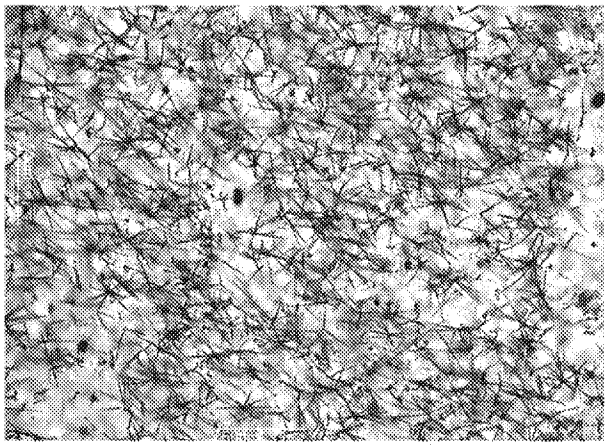
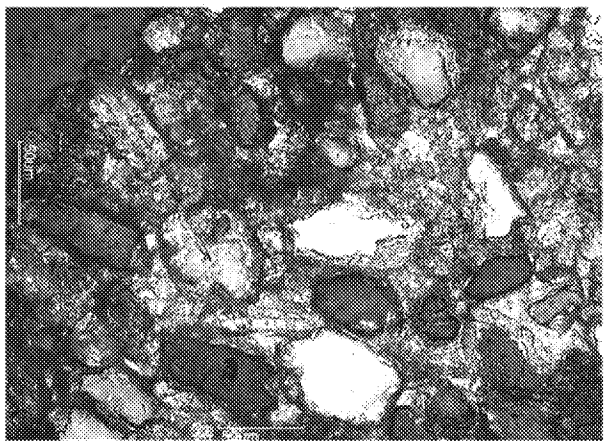
Mineralogical consortia showing quartz, feldspar, and other igneous mineralogy



Client Sample No.: **DD2-BK-25-26-012218**
Calcite and iron oxide cement quartz/feldspar grains. Reflected light crossed Nichols – 200X.



Client Sample No. **DD2-BK-25-26-012218**
otropic volcanic glass riddled with unknown opaque, acicular crystallites. Polarized light – 250X.



Client Sample No.: **DD2-BK-71-72-012318**
Calcite and iron oxide cement quartz/feldspar grains. Reflected light crossed Nichols – 200X.

Client Sample No.: **DD2-BK-71-72-012318**
Fragment of basalt showing lath shaped plagioclase. Polarized light – 200X

Notes

X – times magnified

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ED_004985_00011410-00019

Mineralogical conclusions

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- Geochemically reduced and oxidized minerals are present, indicating heterogeneity in the mineralogical environment, microenvironments, and transitions from reducing to oxidizing conditions, affecting uranium mobility.
  - Pyrite pseudomorphs have been oxidized to iron oxides
  - Pyrite/pyrite pseudomorphs appear in saturated and unsaturated zones
  - The transition from a reduced environ to an oxidized one could liberate uranium by direct oxidation or through dissolution of uranium associated with pyrite
- Clays here have abundant organic carbon and may serve as a reservoir for reduced uranium, with diffusion of water and oxygen resulting in leaching of uranium
  - The clays here contain pyrite (iron), chalcopyrite (copper), galena (lead), sphalerite (zinc), which is important due to relative stability of pyrite
- Minerals present in the Morrison Fm are evident in the alluvial soils near DD/DD2, and morphologies observed indicate water-borne transport and deposition large distances from their origin
- The highest uranium was encountered in the unsaturated zone, indicating that uranium in alluvial deposits is naturally occurring due to transport and deposition of naturally uranium-rich materials over hundreds to thousands of years, not from deposition from uranium-bearing groundwater.

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Cross section – Location

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Cross section

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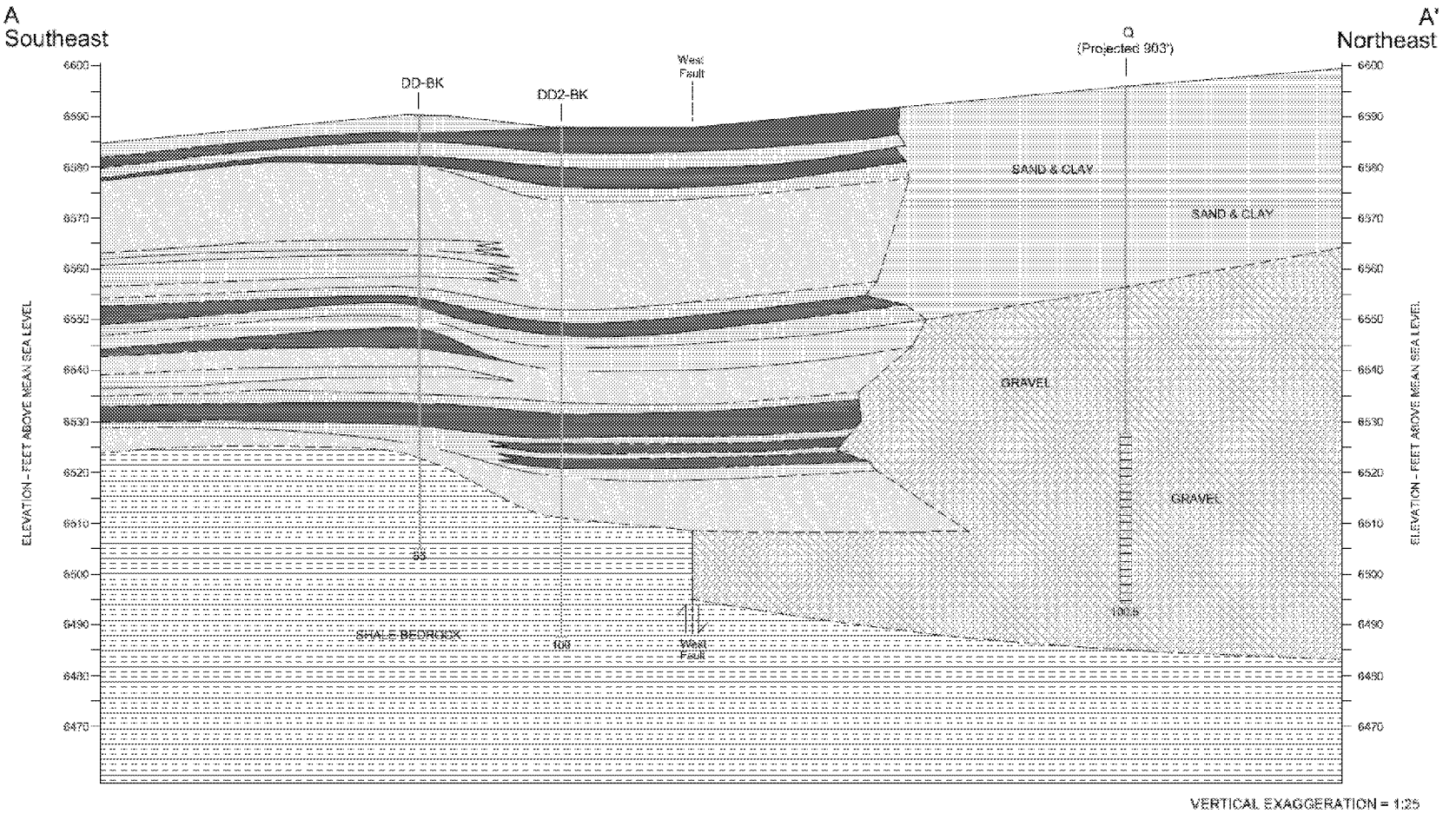
New information in this area! Changes the overall interpretation of the DD/DD-2 area and is more consistent with depositional environment as presented by many geologists over last 100+ years



DD-BK and DD2-BK comparison natural gamma logs

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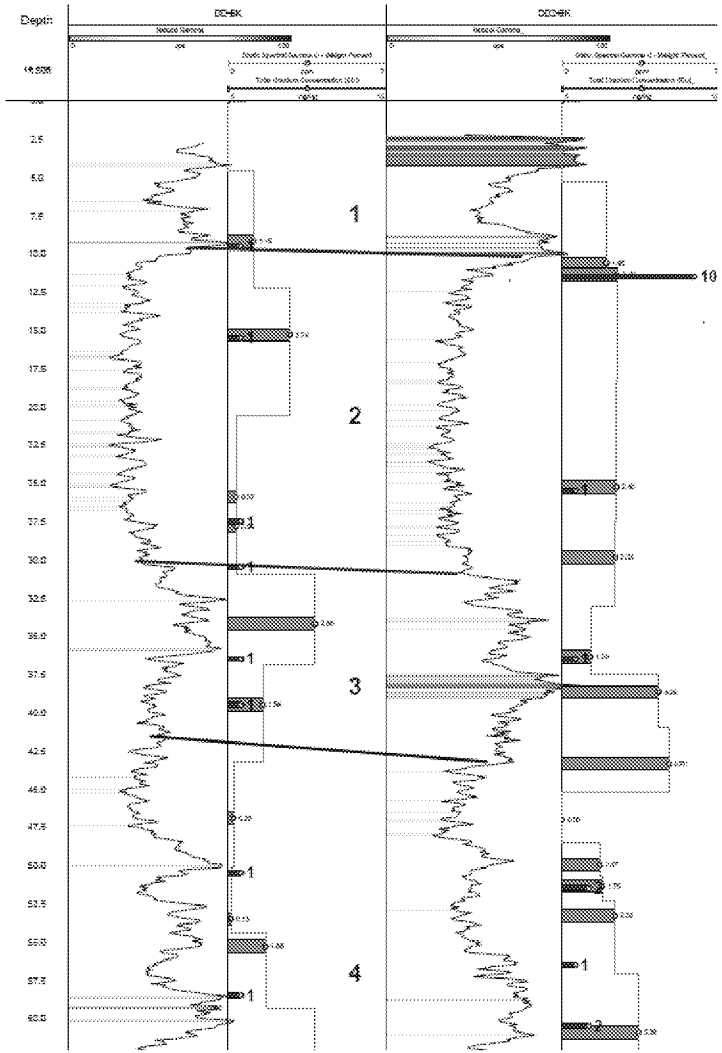

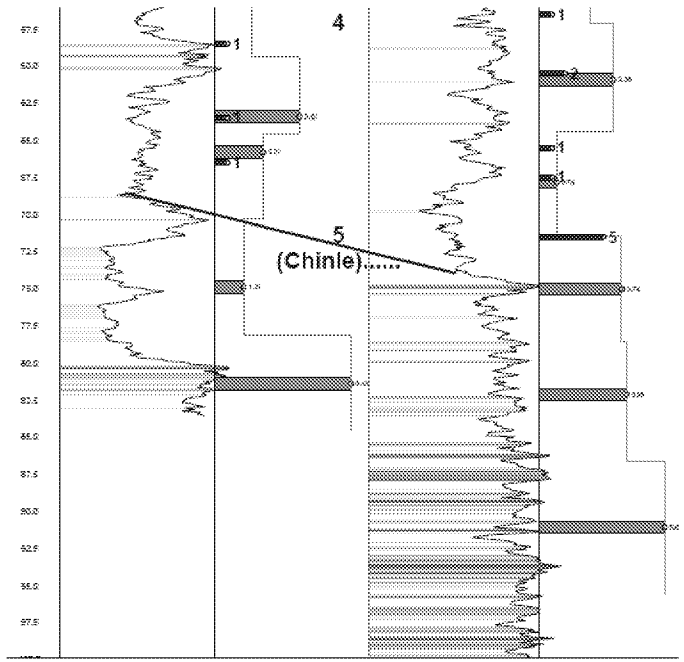

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Alluvial uranium and well construction

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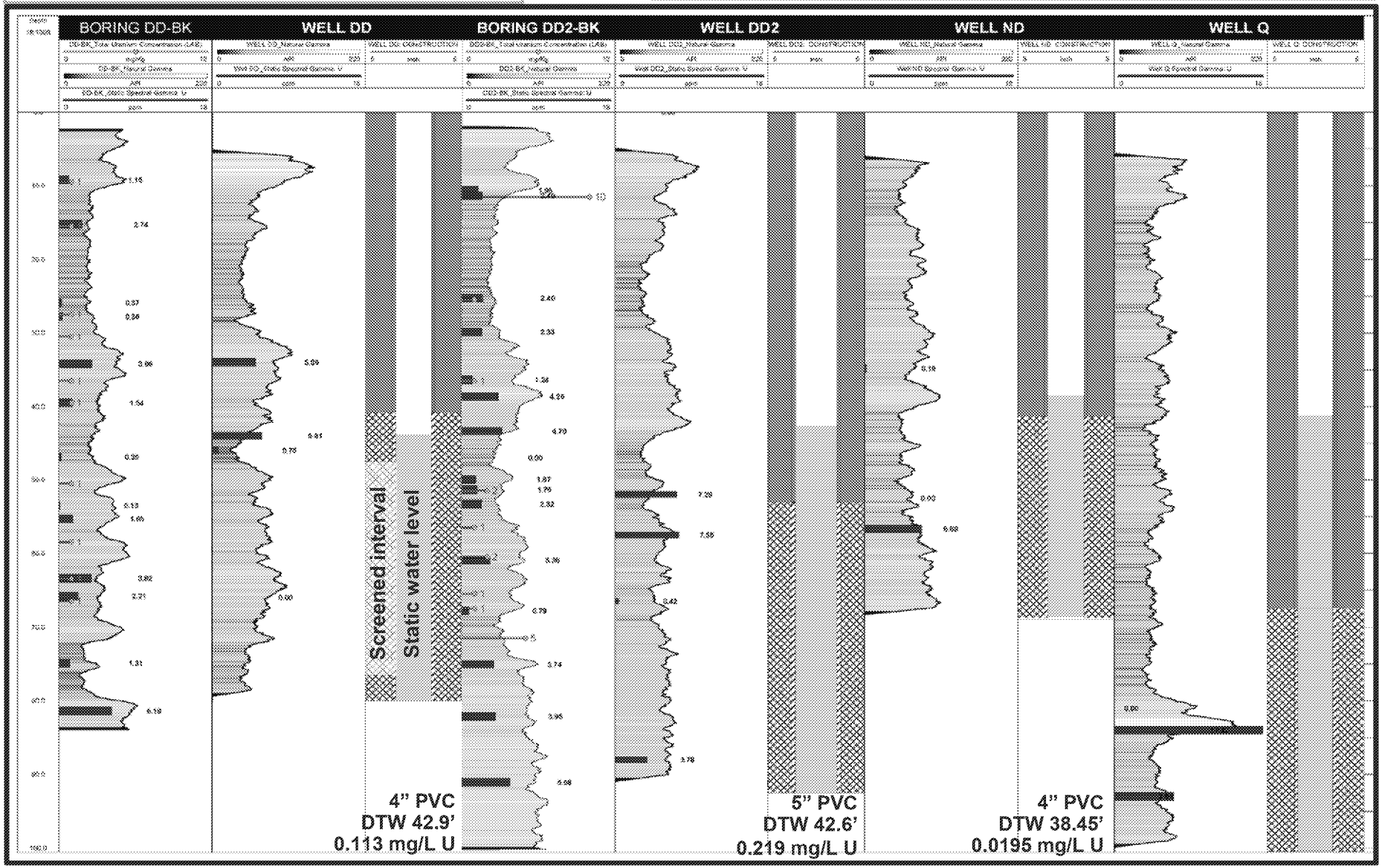
Natural gamma

6.18 Spectral gamma

1 Total uranium in soil borings (lab analysis)

Uranium in alluvium is preferentially in fine grained sediments and varies significantly by location



Note: further refinement of these plots is currently in progress and updated plots will be released in future presentations/publications.

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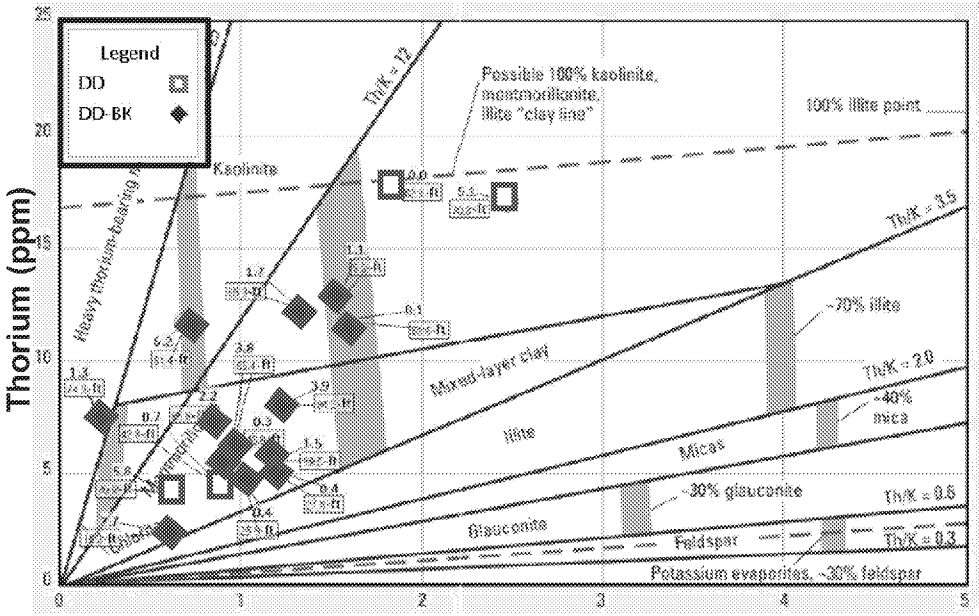

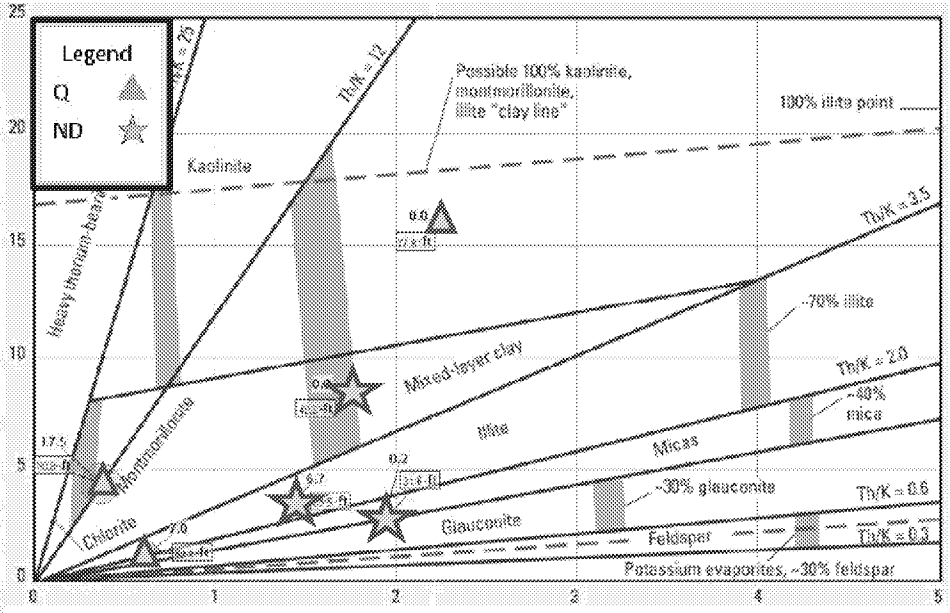

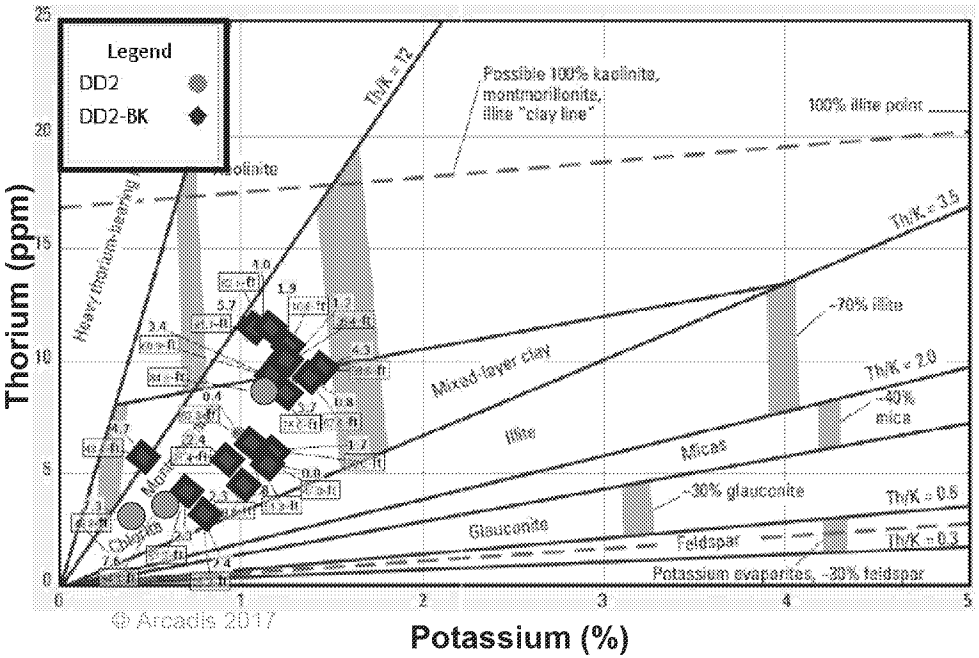

Uranium (ppm)

96.5 - Depth of Static Spectral Data in feet

12.0 - Uranium in ppm from static spectral data

Potassium-thorium plots support different alluvial sediment origin from east to west

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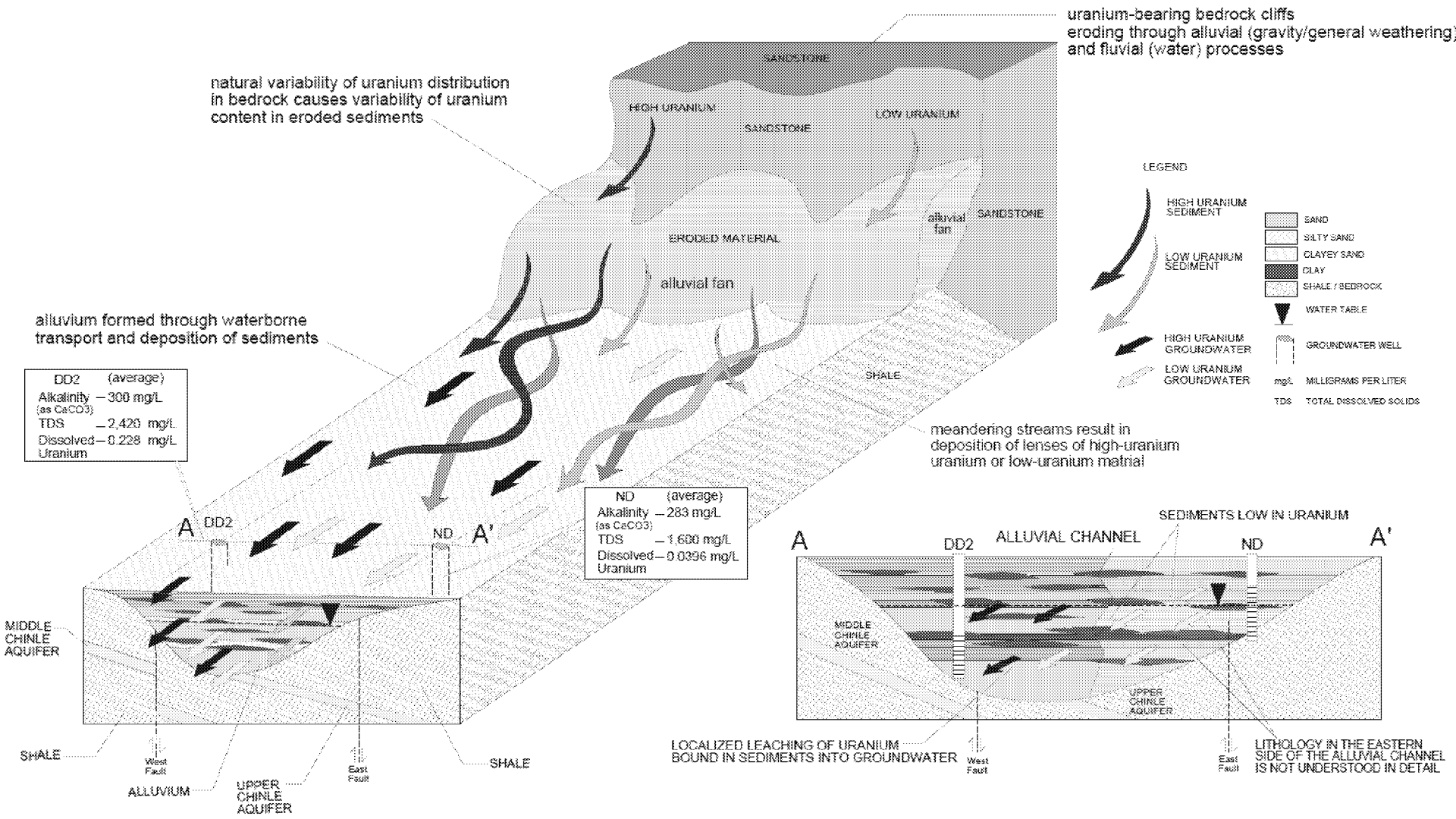

Potassium-thorium plots support different alluvial sediment origin from east to west

HOMESTAKE MINING COMPANY OF CALIFORNIA

Grants Reclamation Project

Evaluation of Water Quality in Regard to Site Background Standards at the Grants Reclamation Project

September 2018

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I. EXECUTIVE SUMMARY

The Homestake Mining Company of California (HMC) Grants Reclamation Project (the site) is a former uranium mill located in the San Mateo Creek Basin in Cibola County, New Mexico. The site operated from 1958 to 1990; milling residue produced two on-site tailing piles (the small tailing pile [STP] and the large tailing pile [LTP]). Both tailing piles have influenced groundwater quality in the alluvial aquifer and shallow bedrock aquifer units immediately below and downgradient from the site. The site was placed on the United States Environmental Protection Agency's (USEPA's) Superfund National Priorities List (NPL) in September 1983 at the request of the State of New Mexico due to elevated selenium concentrations in the alluvial aquifer near the site. As a result, the site's groundwater restoration activities are also being overseen under the USEPA's Superfund Program, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (HMC 2012). In 2016, the EPA began to investigate the Site Background Standards for the Grants Reclamation Project due to the anomalously high concentration (0.2 milligrams per liter [mg/L]) of dissolved uranium detected in site background well DD. Well DD is a key location used in the calculation of the Site Background Standards, and the natural occurrence of uranium here has been questioned by stakeholder groups and regulatory agencies. The USEPA and the United States Geologic Survey (USGS) conducted a groundwater and geophysics investigation in 2016, which was completed in parallel by HMC via split-sampling and resulted in the generation of two parallel groundwater quality datasets. In 2018, two soil borings were completed in the immediate vicinity of site wells DD and DD2. Subsurface soil samples were collected for laboratory analysis and detailed borehole geophysics were also performed.

The objective of this paper is to present the results from:

- The 2016 USGS groundwater split-sampling event (2016 SSE);
- Laboratory testing to validate passive sampling methods used in the 2016 SSE;
- An evaluation of the statistical methods used to calculate the existing Site Background Standards established to meet the requirements of the Nuclear Regulatory Commission (NRC) and USEPA;
- Soil investigations from boreholes installed upgradient of the LTP and mill site, near background groundwater monitoring well DD;
- The development of a conceptual site model (CSM) that describes local naturally occurring mineral sources of uranium to groundwater upgradient of the Grants Reclamation Project.

When taken in context of historical site data and from locations upgradient of the Grants site, the results of the 2016 SSE volumetric purging sampling support the inclusion of well DD in the calculation of the Site Background Standards. The laboratory passive diffusion sampler (PDS) testing showed that the PDSs used at the site were under-deployed, require at least double the amount of equilibration time, and yielded unreliable results. The soil investigations showed the presence of highly heterogeneous sands, silts, and clays, as would be expected from fluvial deposition of eroded sediments over geologic time (at least hundreds of years for shallow alluvial deposits (Leopold and Snyder 1951) and probably thousands for deeper alluvial deposits); detail on the fine-scale heterogeneity (e.g., inches to feet) of alluvial sediments here was previously unavailable. The highest soil uranium concentration of 10 milligrams per kilogram was encountered in the unsaturated zone at a depth of 11 to 12 feet below ground surface (bgs) (groundwater was encountered at 42 feet bgs), indicating that the uranium in sediments around wells DD and DD2 is naturally occurring and is present in sediments that have been deposited due to erosion of

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nearby uranium-bearing bedrock. The alluvial soils showed characteristics and mineralogy resembling units of the uranium-bearing Morrison Formation bedrock north of the site.

Groundwater upgradient of the site that contains elevated concentrations of constituents of concern (COCs) in the middle of the upper San Mateo Creek Basin and upper San Mateo Creek as reported by Gallaher and Cary (1986) has a distinctly different composition relative to alluvial groundwater near the site. Results from the 2016 SSE show that the groundwater restoration activities at the Grants Reclamation Project site did not affect water quality at the background groundwater monitoring wells used in the calculation of Site Background Standards. Additionally, the background wells were not affected by uranium contained in groundwater moving in from upgradient that contains elevated concentrations of COCs during the period that background data was collected. Signatures of this upgradient water include high molybdenum and low uranium activity ratios (UAR). Background wells and other wells upgradient of the site show a lack of molybdenum and high UARs that indicate that the uranium they contain was weathered from a natural mineral deposit and did not come from crushed/leached or milled materials, which would generate low UARs. This work demonstrates that the naturally occurring uranium in the sediments is a local source of uranium to groundwater, that the Site Background Standard for uranium of 0.16 milligrams per liter (mg/L) is valid, and that the groundwater concentration of uranium in the alluvial aquifer upgradient of the site naturally varies at individual locations and depth intervals within the aquifer due to the heterogeneous nature of the sediment's physical and mineralogical characteristics.

II. INTRODUCTION AND OBJECTIVES

The Grants Mill processed uranium ore largely for national defense purposes through a program administered by the Atomic Energy Commission (AEC) as authorized by the Atomic Energy Act of 1954 (Case 1955). The leached ore (or tailings) eventually impacted alluvial groundwater with dissolved constituents including uranium. The site has been listed on the USEPA Superfund NPL since 1983 (HMC 2012). Groundwater is currently undergoing active restoration, aiming to meet background water quality or relevant standards. The objective of this paper is to provide an overview of the site hydrogeology and geochemistry and to present the results of recent work conducted to evaluate the presence of uranium in groundwater at upgradient background monitoring well locations. This work included a comprehensive, multi-method groundwater sampling and analysis event in 2016 that included a geophysical investigation of select monitoring wells, followed by additional work to characterize aquifer sediment lithology, geology, and mineralogy. A conceptual site model (CSM) was developed based on this work and describes local naturally occurring mineral sources of uranium to groundwater hydraulically upgradient of the mill. Uranium concentrations at background locations vary widely across the alluvial basin due to significant variability in aquifer sediment lithology and the presence or absence of minerals that harbor uranium.

The objectives of the individual sections of this paper are provided as follows:

The site overview and hydrogeology are presented in Section II; Section III summarizes the basis for the water quality standards toward which groundwater restoration is directed; Section IV provides the details of the 2016 USGS SSE and geophysics; Section V describes work performed in 2018 to evaluate aquifer lithology and mineralogy; Section VI presents study results and a discussion of the findings; Section VII presents the CSM for naturally sourced uranium to groundwater upgradient of the mill; and conclusions are provided in Section VIII. A Supplementary Information section has been prepared including further

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detail on methods and results not included in the main text. Tables and figures in the Supplementary Information are denoted by the table or figure number preceded by the letter S (e.g., Table S1).

Site History

The site is a former uranium mill located in Cibola County, New Mexico that is owned and operated by HMC. The site occupies approximately 1,085 acres and is located 5.5 miles north of Milan, New Mexico. From 1958 to 1990, 22 million tons of ore were milled at the site. Tailings were deposited in two on-site tailing piles (the Small Tailings Pile and the Large Tailings Pile), along with a collection pond and three synthetic lined evaporation ponds (Figure 1). From 1993 to 1995, the mill was decommissioned and demolished (CH2M HILL 2001). During operation, the LTP received 21 million tons of tailings from the mill. The milling process used an alkaline reagent (sodium carbonate) and processed ore principally from Ambrosia Lake/Grants Mining District. At that time, naturally occurring COC concentrations contained in the uranium ore were elevated in the alkaline tailings pore water. The COCs include uranium, selenium, molybdenum, sulfate, chloride, total dissolved solids (TDS), nitrate, vanadium, thorium-230, and radium-226/228. Pore water seepage from the LTP has influenced shallow groundwater quality and is the primary source of impacts at the site, particularly in the alluvial aquifer directly beneath and downgradient of the LTP.

The seepage from the LTP has been the focus of restoration efforts to limit potential future impacts from the LTP and inhibit the expansion of the plume. HMC manages a groundwater restoration program to restore concentrations of the COCs to levels that meet the accepted groundwater site standards for each COC in impacted aquifers in the area. This restoration program began in 1977 under the direction of the New Mexico Environmental Improvement Board, and the NRC assumed direction of the program in 1986. The site was placed on the USEPA's Superfund NPL in September 1983 at the request of the State of New Mexico due to elevated selenium concentrations in the alluvial aquifer near the site. As a result, the site's groundwater restoration activities are also being overseen under the USEPA's Superfund Program, in accordance with CERCLA (HMC 2012). An updated and revised Corrective Action Plan (CAP) describing the current site restoration program was submitted to the NRC in March 2012 (HMC 2012). The updated CAP includes detailed information about current site conditions, recent modifications to the groundwater restoration program, and aspects of the proposed future components of the CAP, including the evaluation of alternative groundwater treatment technologies. The groundwater restoration program described in the CAP (HMC 2012) is implemented using an adaptive, ongoing strategy that includes five major operational components: (1) source control, (2) plume control, (3) reverse osmosis (RO) treatment, (4) evaporation, and (5) land treatment. Land treatment was discontinued in 2014. The groundwater restoration program is authorized and regulated under NRC License SUA-1471 and New Mexico Environment Department (NMED) Discharge Permit DP-200. The endpoint of the CAP and restoration program is the achievement of the site standards. Based on an evaluation of background water quality that included uranium data from 1995-2004 (HMC and Hydro-Engineering 2003), USEPA, NMED, and the NRC agreed to the Site Standards for each COC and aquifer in 2006. The standards were incorporated into the NRC license via License Amendment Number 39 as Ground Water Protection Standards.

Since approximately 2013, HMC and USEPA have worked cooperatively towards a CERCLA equivalency process for the site, including a review of the administrative record and existing studies and documents to assemble an equivalency Remedial Investigation/Feasibility Study (RI/FS). In 2014, USEPA initiated a

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study to determine if the approved uranium background standards and the subsequently NRC-approved cleanup levels for the site are appropriate (USGS 2016a; Weston Solutions 2016). The USEPA cited a need for multiple lines of evidence, given the complex nature of groundwater at the site, including variations in groundwater geochemistry, groundwater flow paths, and the stratigraphic and structural relationships between the alluvial aquifer and multiple Chinle bedrock aquifers at the site. This re-assessment study (the 2016 SSE) began in earnest with field activities in 2016 and included an initial well survey, geophysical investigation, PDS deployment and retrieval, and groundwater sampling activities. USEPA contracted with USGS to conduct the re-assessment, and HMC/Arcadis attended each aspect of the study, including the collection of split samples of groundwater and independently analyzing the geophysical data. Data from the split samples collected by HMC/Arcadis are referred to as the HMC dataset. Arcadis has since examined the HMC dataset, current as of March 1, 2017, both by comparing the split sampling data generated through USGS' samples and HMC's samples, and by comparing the results of the 2016 SSE to the body of data in the existing HMC historical data database. The generation of the two split sampling datasets creates a unique opportunity for internal comparison of data from independent analyses (excluding the PDSs, which as described below, were separate samples). Additionally, comparing the 2016 split sampling datasets to the historical data puts the 2016 SSE data in perspective regarding groundwater characteristics and variability over time and provides context for how representative the data from this single event are when compared to the existing historical body of data from these wells.

Additional work since the 2016 SSE included of advancement of two boreholes adjacent to wells DD and DD2 to investigate the occurrence of uranium in soils/sediments in the region. This work included detailed lithological logging; grain size, petrographic, and mineralogical analysis; and downhole geophysical evaluation using natural and spectral gamma ray and induction conductivity.

Summary of Regulatory Actions

The following timeline illustrates the major regulatory actions at the site:

Date(s)	Action
1958-1974	The AEC administered the original radioactive materials license when the State of New Mexico became an NRC agreement state, granting it the authority to regulate uranium milling activities.
1976	HMC entered into an agreement with the state to install a groundwater injection and collection system to contain seepage to the alluvium from the tailings pile.
1983	The site was placed on USEPA's Superfund NPL due to elevated selenium concentrations in the alluvial aquifer.
1986	The state relinquished authority to regulate uranium milling activities to NRC.
1990	The mill was closed and the groundwater containment program transitioned to a groundwater restoration program under NRC via License SUA-1471 and a memorandum of understanding between NRC and USEPA Region 6. The NRC required preparation and approval of a Corrective Action Program (CAP). The CAP provides details of the groundwater restoration program with respect to the 11 constituents identified as requiring restoration.
2012	The latest version of the CAP for the site was submitted to NRC in 2012 (HMC 2012).

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The state retains regulatory oversight responsibility through the issuance of discharge permit DP-200, which covers groundwater extraction and injection to accomplish restoration, and discharge to the evaporation ponds and collection ponds. The USEPA retains authority to ensure that reclamation activities will allow attainment of Applicable or Relevant and Appropriate Requirements under CERCLA. The CAP is currently undergoing revision to reflect changes in the groundwater restoration strategy. Once NRC approves completion of the reclamation and USEPA removes the site from the NPL, the license will be transferred to United States Department of Energy (DOE) for long-term custody and care of the site, pursuant to under the Uranium Mill Tailings Radiation Control Act Title II.

Geology and Geochemistry

Bedrock near the site is Cretaceous through Tertiary in age and is overlain by Quaternary alluvial deposits and volcanic flows (Figure 2). Bedrock units include the uranium-bearing Morrison Formation and Dakota Sandstone, with uranium emplacement by precipitation frequently associated with pyrite, organic materials, and/or clay minerals (Heinrich 1958; Brookins 1979). In general, progressively older units of bedrock outcrop from northeast to southwest as a result of regional deformation and subsequent erosion of the exposed units. Bedrock units near the site consist of the Glorietta Sandstone (Early Permian), San Andres Limestone (Early Permian), and Chinle Formation (Late Triassic). The Quaternary units consist of localized andesite and basalt flows and widespread alluvium, which is composed of eroded bedrock materials in the vicinity. The alluvium consists of alternating deposits of clays, silts, sands, and gravels, as riverine deposits from the outwash from the eroded mountains that include the Todilto Limestone, the Morrison Formation, and the Dakota Sandstone.

The site is located in the southeastern part of the Colorado Plateau physiographic province and is mostly on the south flank of the San Juan Basin. This region experienced regional folding and block uplift associated with formation of the Zuni Uplift (Cooley et al. 1969; Anderson et al. 2003; Lorenz and Cooper 2003). As a result of the Laramide deformation, the bedrock units in the vicinity of the site have a shallow northeastern dip direction of approximately 3 to 10 degrees (Kelley 1967).

The development of more recent northeast-trending, high-angle normal faulting associated with the Rio Grande Rift resulted in minor fault displacements in this part of New Mexico in the Miocene (Baldridge et al. 1980). The large northeast-striking San Mateo normal fault, located northeast of the site, has a vertical displacement of as much as 450 feet (Santos 1970). Two small-scale normal faults in the vicinity of the site (known at the site as the West Fault and East Fault) are shown on Figure 3.

Structural offset generally increases to the north along both faults (NRC 2004). In general, these two faults are approximately vertical, exhibit east-side-down shear, and restrict groundwater flow within the permeable units of the Chinle Formation near the site. Except for the southern terminus of the East Fault, structural offset within the Chinle Formation has resulted in the juxtaposition of permeable sandstones with low permeability shales across both faults. The relatively small offset of the underlying San Andres-Glorietta (SAG) regional aquifer does not appear to significantly affect groundwater flow in the SAG.

Uranium Occurrence in Minerals

Uranium occurs naturally in rock. During the formation of continental crust, it undergoes a series of complex fractionation events resulting in highly variable concentrations in different rock types. Uranium is

most concentrated in felsic igneous rocks including granites, rhyolites, and alkaline complexes (Plant et al. 1999). The uranium undergoes leaching to surface water and/or groundwater through a variety of processes, most commonly exposure to carbonate-rich waters due to carbonate mineral dissolution (Langmuir 1978). Redeposition of uranium occurs in sandstones in association with geochemically reducing or reduced materials such as organic detritus and/or pyrite (Plant et al. 1999). Unoxidized deposits consist of uraninite and coffinite, and uranium may be associated with vanadium or copper (Heinrich 1958). In the Grants Mineral Belt, tabular uranium sandstone deposits of late Triassic/Early Jurassic and Late Jurassic/Early Cretaceous origin are common. Silicic ash may be the source of uranium that was leached, mobilized, and then redeposited in the sandstone due to reductive precipitation with organics derived from plant matter, humates, and sulfides (Plant et al. 1999). The Todilto Limestone and Morrison Formation are the primary bedrock hosts of uranium in immediate vicinity of the site. Ore in the Jurassic Brushy Basin member of the Morrison Formation is composed of an average vanadium:uranium ratio of 0.5:1 and contains coffinite (uranium silicate), pyrite, galena, metatyuyamunite (calcium uranium vanadate), autunite (calcium uranium phosphate), gypsum, kaolinite, calcite, and asphaltite (a bituminous mineral that coats sand grains and contains coffinite) (Heinrich 1958). In addition, uranium is complexed and sorbed onto clay minerals in the ore materials within the mineral belt (Brookins 1979). The Morrison outcrops just north of the site; weathering of this sandstone over geologic time (hundreds to thousands of years), along with weathering of the Dakota Sandstone and possibly the Zuni Mountains, has deposited sediments in the alluvial basin upgradient and throughout the site (McLemore 2010).

Dissolution of Uranium from Naturally Occurring Minerals

Uranium is present in two principle chemical forms in the various minerals described above, defined by the number of electrons that are deficient in its outer electron shell, leading to differing reactivities of the two oxidation states. In the +4 oxidation state, uranium has very low solubility and is stable in environments where oxygen is mostly absent. The most common +4 mineral form is uraninite (UO_2). In groundwater environments where oxygen is present, uraninite will oxidize and release uranium into solution in the +6 oxidation state. This form of oxidized uranium is most common in groundwater as the uranyl cation (UO_2^{+2}) and readily combines with dissolved carbonate to form uranyl carbonate (e.g., UO_2CO_3). In this form, uranium is very soluble and stable in the aqueous phase – it is the predominant form of uranium in the alluvial groundwater system described previously. Alkaline minerals in the alluvial aquifer and within limestone formations in the region contribute alkalinity to the groundwater, and this is the primary means by which uranium leaches from uranium-bearing minerals. Numerous studies have demonstrated leaching of uranium minerals (such as uraninite) by carbonate solutions, dissolved oxygen, and ferric iron (Sani et al. 2005); however, the presence of iron minerals (both as ferrous and ferric iron) can limit uranium remobilization, and iron can serve as a sorptive phase for oxidized uranium (Zhong et al. 2005). Other components of groundwater, including natural organic matter, can enhance leaching of uranium from minerals as organic ligands form strong aqueous complexes with uranium (Francis et al. 1992; Luo and Gu 2011). Uranium is therefore sourced to groundwater from naturally occurring minerals through oxidation and leaching by oxidizing, carbonate-rich waters in the alluvial groundwater system.

Immobilization of Uranium from Groundwater

Processes that re-precipitate uranium are also active at interfaces between oxic and anoxic groundwater, within both high- and low-permeability sediments. Ferrous iron minerals, such as iron sulfides (e.g.,

mackinawite or pyrite), along with dissolved ferrous iron can transform soluble, oxidized uranium to low-solubility uranium +4 mineral phases (Hua and Deng 2008). Microorganisms present in aquifer sediments are also capable of facilitating the precipitation of uranium; sulfate-reducing bacteria have been shown to catalyze the precipitation of soluble uranium into UO_2 and iron sulfide phases (Lovley and Phillips 1992; Spear et al. 2000). As discussed above, uranium will co-precipitate with iron oxide minerals at the interface of anoxic and oxic environments, where ferrous iron may transition to ferric iron (Duff et al. 2002). Redox transition zones, and the mineral assemblages at these oxic/anoxic interfaces, are dynamic environments relative to uranium mobility. Uranium cycling can often occur, leading to variable uranium concentrations in groundwater systems depending on highly localized geochemical environments and sediment mineralogy. Understanding groundwater movement through these zones is critical.

Hydrogeology

The site is located within the San Mateo Creek, Lobo Creek, and Rio San Jose drainages (Figure 2). Lobo Creek (ephemeral) is a tributary to the San Mateo Creek (ephemeral one mile south of the town of San Mateo), which in turn is a tributary to the Rio San Jose drainage. The San Mateo Creek drainage basin occupies approximately 240 square miles and includes the Grants site. The Lobo Creek drainage area occupies approximately 56 square miles and borders the eastern side of the Grants site. Lobo Creek joins San Mateo Creek at the site, but neither of the ephemeral creeks has a well-defined channel near the site, and surface flow is infrequent. The Rio San Jose drainage borders the western side of the site.

The shallow, unconfined alluvial aquifer in the region includes the Quaternary alluvium and surficial volcanic flows. Deeper confined aquifers include three aquifers within the Chinle Formation and the SAG regional aquifer in the San Andres Limestone and the Glorietta Sandstone (Figure 4).

Surface Water and Groundwater Interactions

The regional climate of western New Mexico is an arid to semi-arid, temperate continental climate. Precipitation is limited, and most of the annual precipitation occurs during thunderstorms in the late summer to early autumn. Surface water in the vicinity is limited to small, ephemeral stream courses. Surface flow on and near the site occurs only after extreme precipitation events and is generally limited to reaches of the local San Mateo and Lobo Creeks (Hydro-Engineering 1993). Losing conditions exist along the ephemeral stretch of the San Mateo Creek near the site. Although no streams exist on the site, the site employs a variety of strategies to limit or manage groundwater interaction with both stormwater and water used in CAP operations (HMC 2012).

In the mid-1950s, uranium mining was conducted to the north of the Grants Reclamation Project centered within the Ambrosia Lake Mining Subdistrict of the Grants Mining District; operations associated with mining ceased in the mid-1980s. Levels of dissolved molybdenum, selenium, and uranium have been elevated in groundwater to the north of the site (Weston Solutions 2016). Discussion of the groundwater moving in from upgradient that contains elevated concentrations of COCs in the lower San Mateo Creek Basin is provided in the Results and Discussion section of this paper.

Alluvial Aquifer

The alluvial aquifer near the site consists of three distinct but connected alluvial systems: the San Mateo, Rio San Jose, and Lobo alluvial systems, which represent the uppermost aquifer in the groundwater system. This shallow, unconfined alluvial aquifer includes Quaternary alluvium and surficial volcanic flows. The Quaternary alluvial materials at the site area were partly derived from the erosion of uranium-bearing bedrock (Gallaher and Cary 1986) and were deposited unconformably on the eroded surface of the Chinle Formation. Quaternary andesite and basalt flows are distributed in all directions around the town of Grants and are interbedded with the alluvial deposits. The alluvial aquifer extends from 10 miles northeast of the site to the south and southwest, eventually joining with the more extensive Rio San Jose alluvial system. In the immediate vicinity of the site, the alluvial system follows the San Mateo drainage, which directly underlies the LTP. The average total thickness of the saturated and unsaturated portions of the alluvium near the site is approximately 95 feet, with a maximum thickness of approximately 120 feet (HMC 2012), with depths to bedrock increasing to the southeast. The alluvial aquifer is composed primarily of sand, gravelly sand, silty sand, and spatially heterogeneous deposits of clay. The extent of the saturated portion of the alluvial aquifer near the site varies from 0 (where bedrock highs are shallower than the groundwater table) to 80 feet thick (HMC 2012) (Figure 5) with an average thickness of approximately 35 feet near the site. HMC has drilled more than 900 wells at the site and nearby downgradient locations. The deepest portion of the alluvial aquifer is present below the western side of the LTP, while the shallowest portion of the saturated alluvial aquifer is present in an area extending from the eastern Murray Acres subdivision to the STP.

Alluvial Groundwater Flow Dynamics

Alluvial groundwater flow in the Grants Reclamation Project area is generally to the southwest. Numerous lines of evidence support the southwestern flow direction in the alluvial aquifer beneath and upgradient of the site with no reversal in the natural hydraulic gradient, even with minor water level increases beneath the LTP (HMC and Hydro-Engineering 2003, HMC 2015, HMC 2016). These results are consistent with major ion chemistry, showing that HMC Mill-influenced water has not migrated from the LTP into wells located to the north. Downgradient of the site, alluvial flow is divided by a bedrock high to the southwest, where most alluvial groundwater flows west and a small portion flows south (Figure 5).

Alluvial flow directions are most variable immediately to the south and west of the LTP, resulting from the hydraulic barrier established as a plume control strategy within the current site restoration program. The program includes water injections to reverse the hydraulic gradient within and downstream of the COC plume, limiting migration toward communities and redirecting water with high COC concentrations to extraction wells. Local flow directions are reversed between the injection and collection well networks, but the gradient reversal is limited to the immediate vicinity of the well network southwest of the LTP. Annual recharge to the alluvial aquifer in the form of direct infiltration from precipitation is limited.

Alluvial Groundwater Quality

Gradual seepage of pore water from the tailings in the LTP is influencing alluvial groundwater quality. Pore water in the LTP contains elevated concentrations of uranium and other COCs as a result of the alkaline leach milling process. Seepage water moves from the bottom of the LTP into the partially saturated zone above the alluvial aquifer and follows the groundwater gradient southwest of the LTP,

where it is currently managed by the plume control program. Based on data from 1976 through 2017, areas immediately to the south and southwest of the LTP exhibit the highest dissolved uranium concentrations (Hydro-Engineering 2018).

Chinle Formation Aquifers

The Chinle Formation is the shallowest bedrock unit near the Grants site. It is approximately 850 feet thick and consists of low-permeability, massive shale that greatly restricts vertical groundwater flow (HMC and Hydro-Engineering 2010). Within the Chinle Formation are three hydraulically isolated and uniformly distributed sandstone aquifer units (Upper Chinle, Middle Chinle, and Lower Chinle aquifers), each bounded by overlying and underlying low-permeability shale (Figure 4). Each aquifer unit subcrops at the base of the alluvium (Figure 6), where hydraulic connection occurs in areas of alluvium saturation (mixing zones). The West and East Faults act as impermeable barriers to groundwater flow within the Chinle Formation aquifers near the Grants site. The shale also serves as a competent aquitard between the surficial alluvial aquifer and underlying San Andres-Glorietta regional aquifer in this area (HMC and Hydro-Engineering 2010).

The Upper Chinle aquifer is a northeast-dipping, confined aquifer composed of a laterally continuous sandstone unit. The Upper Chinle aquifer subcrops at the base of the alluvium on both sides of the East Fault, most notably at the base of the western side of the LTP (Figure 6). Due to the structural separation across the faults, the aquifer can be viewed as two hydraulically isolated aquifer systems across the West Fault. Though differences in hydraulic head between the alluvial aquifer and underlying Upper Chinle aquifer along the length of the subcrop are often indistinguishable, the alluvial aquifer discharges to the Upper Chinle east of the East Fault and in the vicinity near and north of the LTP. As a result of this direct hydraulic communication, the water quality of the Upper Chinle aquifer is influenced by the water quality of the alluvial aquifer, particularly beneath the western side of the LTP, an area known as the Chinle Mixing Zone.

Similar to the Upper Chinle aquifer, the Middle Chinle aquifer is an east-to-northeast-dipping, confined aquifer composed of laterally continuous sandstone. Due to groundwater pumping and fresh water injection across the site and flow barrier boundaries associated with local faulting, flow directions in the Middle Chinle aquifer vary spatially. The Middle Chinle aquifer subcrops at the base of the alluvium (Figure 6). Upward flow from the Middle Chinle discharges to the alluvial aquifer on the west side of the West Fault, and downward flow from the alluvial aquifer to the Middle Chinle occurs at the subcrop between the faults (HMC and Hydro-Engineering 2010b).

The confined Lower Chinle aquifer is the deepest permeable zone within the Chinle Formation and is located approximately 200 feet above the geologic contact with the San Andres Limestone. The Lower Chinle aquifer is composed of shale with enough developed secondary permeability to behave as a limited aquifer (HMC and Hydro-Engineering 2010b). The Lower Chinle aquifer subcrops at the base of the alluvium on either side of the West Fault with an offset of ~3,000 feet (Figure 6). The head differential near the subcrop indicates that the alluvial aquifer most likely recharges the Lower Chinle aquifer on both sides of the West Fault.

San Andres-Glorietta Regional Aquifer

The SAG is the most significant regional aquifer in the Grants area. The aquifer consists of the northeasterly dipping San Andres Limestone and Glorietta Sandstone, with a total thickness that exceeds 200 feet (HMC and Hydro-Engineering 2010b). The aquifer has been used as the source for unimpacted water injection into the alluvial aquifer and Chinle Formation aquifers at the Grants Reclamation Project.

The alluvial aquifer and the SAG are separated by a very thick (~800 feet) Chinle Shale aquitard at the Grants Reclamation Project. The SAG is in direct hydraulic communication with the overlying alluvial aquifer at the subcrop location near Highway 122, approximately 6.5 miles west of the Grants Reclamation Project (HMC and Hydro-Engineering 2010b). Direct hydraulic communication also exists with the Rio San Jose alluvial system on the west side of Milan (Dillinger 1990). Flow directions are nearly uniformly directed to the east-southeast. The difference in hydraulic head between the alluvial aquifer and the SAG ranges from approximately 80 to 100 feet, which confirms that the flow between the two aquifer systems is restricted by the Chinle Formation (HMC 2009). Based on the observed depression of the alluvial water table surface near the SAG subcrop, the alluvial aquifer likely recharges the SAG in the Bluewater Mill area to the west of the Grants Reclamation Project (DOE 2014).

III. CONSTITUENT BACKGROUND CONCENTRATIONS AT THE GRANTS RECLAMATION PROJECT

The NRC established Site Background Standards for the site based on concentrations measured in one alluvial well (well P; NRC 1989) between December 1988 and February 1989 (HMC 1989). Due to the small spatial and temporal sample size of this original background evaluation, a re-evaluation of the Site Background Standards ensued from 2001 to 2006. Initially, groundwater quality data collected from 1976 to 1998 for alluvial wells DD, ND, P, P1, P2, P3, P4, Q, and R (near upgradient wells) were used to characterize upgradient alluvial groundwater to set the background concentrations for COCs at the site (ERG 2001). Comments provided by NMED in 2005 requested that background concentrations be set based upon the last 10 years of data (HMC 2005b). Data from the nine wells in the alluvial aquifer were evaluated for the period 1995 – 2004 (124 individual data points) and used to establish the Site Background Standards. In addition, data from 13 wells in the Chinle Mixing Zone (96 data points), five wells for the Upper Chinle aquifer (166 data points), six wells for the Middle Chinle aquifer (190 data points), and six wells for the Lower Chinle aquifer (58 data points) were used to establish the Site Background Standards in the mixing zone and bedrock aquifers.

Final agreement among NRC, USEPA, and NMED on Site Background Standards was reached in 2005, as documented in NRC Materials License SUA-1471 Amendment 39 (NRC 2006), the USEPA Second Five-Year Review Report (USEPA 2006a), and a letter from NMED to USEPA (NMED 2005). The Site Background Standards were a component of the Ground Water Protection Standards for those constituents for which site-specific standards were developed. Ground Water Protection Standards for molybdenum and chloride are based on established values (40 CFR Part 192, Subpart A, Table 1 for molybdenum and the EPA secondary MCL for chloride). The Site Background Standards were developed using statistical methods applied to the groundwater data; specifically: 1) non-detects were handled by using the detection limit divided by 2, 2) outliers were removed using an a priori screening test (outliers were defined as maximum values greater than three times the next highest value), 3) data distribution tests (to determine a parametric or non-parametric distribution), and 4) calculation of the 95th percentile of the dataset. Current Ground Water Protection Standards are shown in Table 1. In 2016, in concert with the 2016 SSE driven by USEPA, Arcadis reviewed the statistical basis for the calculation of the Site Background Standards for uranium, molybdenum, sulfate, chloride, TDS, nitrate, and vanadium. The purpose of the review was to assess if statistical analyses used to establish background concentrations in five groundwater zones (Alluvium; Chinle Mixing Zone; and the Lower, Middle, and Upper Chinle aquifers) were appropriate and consistent with up-to-date software tools, methods, and guidance.

Arcadis reviewed the statistical methods used in the HMC (2006) background assessment and re-calculated based on current recommended tools and methodology using USEPA's ProUCL 5.1 Software (USEPA 2015). Arcadis concluded that the work performed to determine Site Background Standards based upon a statistical evaluation of the 10 years of data was valid and correct. In an effort to perform the most up-to-date evaluation, Arcadis calculated upper tolerance limits (UTLs) considering the following items based on current (updated) methodologies and tools for calculating background values:

- Use of Kaplan-Meier methods for non-detects instead of detection limit divided by 2
- Influence of potential outliers identified using the interquartile range test, based on the USEPA-recommended boxplot screening methodology (USEPA 2006b)

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- Use of Shapiro-Wilk and Lilliefors test statistics for all datasets to test normality/lognormality
- Use of Kolmogorov Smirnov test statistic to identify gamma distributed datasets
- Calculation of gamma UTL for gamma distributed datasets.

The review resulted in several key findings.

- The dataset used to establish statistically based Site Background Standards values is considerably robust, with often more than 100 samples used in calculations across more than 10 years of sample collection.
- Data distributions were confirmed to be the same as previously reported (primarily non-detect) except for four cases (molybdenum, TDS, sulfate, and nitrate in the mixing zone).
- Recalculated UTLs were consistent with the current Site Background Standards for the alluvial groundwater system as established in 2006.

The evaluation of the background dataset confirmed that uranium concentrations in DD were substantially higher than those in the other alluvial aquifer wells, prompting further investigation. The information included in this white paper supports the inclusion of well DD in the background dataset and shows that the uranium in well DD is a function of the natural variability of uranium in alluvial sediments and groundwater north of the site.

In summary, the previous statistical background assessments completed on behalf of HMC for establishing Site Background Standards appear to be robust. In the few cases where the modern UTLs do not agree with previous values, most of the original calculations provided a conservative (lower) value for the Site Background Standards than has been calculated using the most current USEPA methods. Therefore, if the Site Background Standards were adjusted based on current tools and guidance, this would result in slightly increased concentrations in all but two cases.

Additional concerns have been raised surrounding the validity of the 2006 Background Study due to the presence of groundwater moving in from upgradient that contains elevated concentrations of COCs moving toward the Grants Reclamation Project from the northwest and due to the installation of the hydraulic barrier on the north side of the LTP that resulted in increased water levels north of the site. While constituents similar to those of the Grants Reclamation Project are present within the this upgradient groundwater, evidence that these COCs have reached the wells used in the 2006 Background Study has only recently (within the last two to five years) been observed (e.g., selenium at background well R; Hydro-Engineering 2018). The wells sampled in the Background Study showed no evidence of uranium impacts from this upgradient groundwater during the time period over which groundwater samples were collected for the Background Study (1995-2004). In addition, increases in water levels north of the LTP due to application of the hydraulic barrier were seen starting around 2004. Neither the hydraulic barrier nor the resulting damming effect of the groundwater moving in from the north affected the results of the 2006 Background Study. Thus, the period for sampling during which the background wells, spanning 1995 through 2004, provided the most representative data for the calculation of UTLs on which the Site Background Standards are based.

It should be acknowledged that, while the site background standards were calculated using groundwater samples that were unaffected by anthropogenic water quality impacts, the site itself should only be

required to address groundwater impacts related to historical operations at the site. The site standards, set during the period during which groundwater moving in from upgradient with elevated concentrations of COCs was not present near the site, will likely need to be adjusted in order to ensure that the Grants Reclamation Project is only responsible for remediating groundwater contamination resulting from historical activities at the site.

IV. DATA COLLECTION: 2016 GROUNDWATER SPLIT SAMPLE COLLECTION AND GEOPHYSICS

Groundwater Sample Locations

As discussed in the Introduction, in 2016, USEPA initiated a study to determine if the approved uranium background standards and the subsequently NRC-approved cleanup levels for the site are appropriate. Groundwater sampling conducted by Arcadis for HMC during the study was performed in accordance with the Supplemental Groundwater Quality Background Assessment Sampling and Analysis Plan (SAP; Arcadis 2016a). Groundwater samples were collected from a total of 20 sample locations (19 groundwater wells and the RO treatment plant product water SP2) as illustrated on Figure 1. Of the 20 sample locations, six alluvial monitoring wells were subjected to geophysical logging, passive diffusion sampling, micropurge (MP), and volumetric purge (VP) sampling, including:

Well	Location Relative to LTP
DD	northwest
DD2	northwest; just upgradient of well DD
MV	southwest
ND	northeast
Q	north
T-11	on top of and in the northwestern portion of the LTP

Well n-17, listed in the SAP, was initially proposed for sampling by USEPA; however, due to time constraints and unfavorable field conditions, it was excluded from the study. Samples from well CW-26 were also excluded from this work. Well and borehole construction details, including screened intervals, where available, are listed in Table 2.

Volumetric Purge, Micropurge, and Passive Diffusion Samplers

Static water level measurements were collected before groundwater sampling. Field parameters (temperature, pH, specific conductance, dissolved oxygen [DO], turbidity, and oxidation-reduction potential [ORP]) were measured using an in-line flow-through cell connected to a tee so that USEPA/USGS and Arcadis/HMC could measure field parameters simultaneously. Field parameters were recorded during purging and immediately before sample collection for VP samples. DO and ferrous iron were measured using a Hach DR1900 Portable Spectrophotometer with Hach Methods 8166 and 8146, respectively.

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Passive Groundwater Sampling and Analysis

The goal of a PDS is to collect a sample from the aquifer that is not subject to artifacts caused by pumping. Ideally, the water captured in a PDS will be representative of a time-weighted average of the water in the well at the deployment depth over the deployment period. Groundwater samples were collected using nylon screen PDSs per Vroblesky et al. 2002 and Vroblesky et al. 2003, as summarized in USGS 2016a and a teleconference with USEPA and USGS on June 17, 2016. USGS increased the PDS size from 30-milliliter (mL) to 250 mL (USGS 2016b).

USEPA/USGS and HMC PDSs were deployed on August 30 and 31, 2016. PDSs were grouped in sleeves of flexible low-density polyethylene mesh (Industrial Netting Item #NG2040) to form a "stack" of PDSs, with the nylon screen facing downward. Arcadis deployed equivalent PDSs for HMC within the same PDS stack to assess the reproducibility/variability of USEPA/USGS results. Each stack was attached to a weighted rope and lowered into the well to the desired depth. Additional details are presented in the Summary of USGS/USEPA Geophysical Logging and PDS Deployment Field Events Memorandum presented in Appendix A.

PDSs were collected 34 to 37 days after deployment during the groundwater sampling field event (October 4 through 7, 2016), when they were retrieved, preserved with lab-supplied preservative, capped, and shipped on ice to the analytical lab. Samples were filtered by the lab and analyzed for dissolved selenium and uranium using USEPA method 200.8. Additional total and dissolved sodium and potassium (USEPA method 200.8) data were requested for all samples (MP, VP, PDS) to help with interpretation of the results.

Micropurge Groundwater Sampling

After PDSs were retrieved, a pump was placed in the well at the desired depth, and an MP sample was collected under low-flow conditions. Approximately two pump plus tubing volumes were purged to make sure that residual water in the pump or tubing was not incorporated into the sample. Approximately 1 liter of groundwater was collected, split between two bottles, preserved with lab-supplied preservative, capped, and shipped on ice to the analytical lab. Each MP sample was analyzed for total selenium and uranium through USEPA method 200.8.

Volumetric Purge Groundwater Sampling

Split samples were collected after three well casing volumes were purged from non-pumping wells. Pumping wells CE-7 and ST and the RO plant product water outlet (SP2) were sampled directly. Field parameters were collected after each well volume was purged (Table S1). Only well CW-2 reached parameter stability according to Arcadis' Groundwater Sampling SOP before sampling. The SOP requires that the following conditions be met when averaging the final three measurements during the purge: pH is within 0.1 units, conductivity is within 3%, dissolved oxygen is within 10%, ORP is within 10%, and turbidity is within 10% unless the turbidity is measured at 10 Nephelometric Turbidity Units or less. Stable conductivity was not achieved in wells ND and ST before sampling. If turbidity is ignored, parameter stability was achieved in wells CE7, CW1, CW-2, CW-18, CW28, CW-37, CW45, DD, DD2, MV, P-3, Q, and T-11 before sampling. The VP groundwater samples were submitted to the applicable laboratories for the analyses and methods listed in Table 3.

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Quality Assurance/Quality Control

Groundwater samples were collected, handled, and preserved in accordance with the Quality Assurance Project Plan (QAPP), which was an Appendix to the SAP (Arcadis 2016a). In addition to proper equipment calibration, decontamination, and care by field workers to adhere to SOPs and field protocols, field duplicates, equipment blank samples, field blank samples, and matrix spike (MS)/matrix spike duplicate (MSD) analyses were performed. Field duplicates and equipment blanks were collected at a rate of one per 20 samples in accordance with the Contract Laboratory Program National Functional Guidelines for Inorganic Review (USEPA 2017). Field blank samples were prepared from clean water sources and prepared by pouring analyte-free reagent-grade water (e.g., ASTM Type II) into clean sampling bottles and preserving as needed. Field blank samples may be used to assess the potential for cross-contamination during field sampling. To identify blank contamination, one field blank sample was collected per clean water source used during field activities. Laboratory quality assurance/quality control (QA/QC) measures are detailed in the SAP.

Geophysics

USEPA/USGS conducted a geophysical logging event from August 8-13, 2016. Arcadis staff were in attendance to document these activities. The USEPA/USGS objective was to collect borehole geophysical data logs from seven monitoring wells completed in the alluvial aquifer (DD, DD2, MV, ND, Q, T-11, and n-17). Due to weather delays and well construction/access issues, well n-17 was not logged. The suite of geophysical data collected by USEPA/USGS included measurements using a caliper, natural gamma (run on a gamma/resistivity probe), induction, spectral gamma, optical televiewer, and electromagnetic (EM) flowmeter, as well as fluid temperature and conductivity.

USGS performed pumped flow meter testing in three of the six wells (ND, DD, and Q). The visual appearance of the screen in Well ND appeared relatively clear on the optical televiewer data, and the vertical flow was nearly constant, indicating uniform output from the entire screen length. In contrast, the visual appearance of the screens in Wells Q and DD appeared fouled, to the point where the screen slots are not visible, and in both cases the flow was highest at the top of the well screen and decreased with depth; this decline in vertical flow with depth is interpreted as being related to the clogging of the screen slots and possibly pores in the sand pack. From this, we suggest that well condition may have an influence on the relative vertical contribution of groundwater during well sampling activities, which could affect PDS results. In comparing two wells near one another (Wells DD and DD2), Well DD was fouled in the appearance of the well screen and was 21 years old during geophysical logging, whereas Well DD2, which was 8 years old, was relatively clear.

Note that, in logging existing monitoring wells, the USGS did not have access to physical samples of the alluvium and had to rely on existing descriptive logs for lithologic interpretations. Geophysical information obtained in monitoring wells can be limited by and in some cases affected deleteriously by well materials such as riser and screen, centralizers, protective casings, sand pack, bentonite seals, and grout. For example, because annular fill materials exist between the logging probes and the formation, the presence of clays and potassium-bearing minerals in the well seals, sand pack, and grout can create anomalies unrelated to the formation. Bentonite, in particular, can produce a significant amount of natural gamma signal associated with potassium as well as an electrically conductive response. Bentonite (Wyoming bentonite) has a mean potassium concentration of 0.55 percent (Karnland 2010), with naturally

radioactive potassium-40 as the main source of gamma radiation associated with potassium. Because it is possible that clay minerals such as montmorillonite (the main constituent in bentonite) can be the locus of uranium sorption under proper geochemical conditions, it is also possible that spectral gamma analysis may exhibit uranium concentrations that are influenced by the properties of the annular well materials rather than or in addition to the formation. The limitations associated with the interpretation of the data obtained from the geophysical assessment performed by USGS on the six existing wells was the impetus for separate work performed by HMC/Arcadis on two new boreholes installed adjacent to existing wells DD and DD2. The geophysical data obtained on uncased boreholes eliminated the potential interference of the casing and annular well materials and resultant uncertainty in the interpretation of these data.

Passive Diffusion Sampler Testing

Due to wide variability and inconsistencies in the PDS data collected during the 2016 SSE, Arcadis conducted additional testing at the Arcadis Treatability Laboratory (Treatability Lab) in Durham, North Carolina. This testing was designed to evaluate the equilibration of dissolved sodium, potassium, selenium, and uranium achieved over 8 weeks. Sodium and potassium were chosen as test analytes due to their unreactive nature; their diffusion into the PDS is not likely to be affected by minor changes in pH or redox potential, and they act as reference ions for the maximum amount of diffusion possible over the test period. Details on the methods employed during the PDS laboratory testing, including photographs of the testing setup (Figure S1), plots of the results (Figures S2-S5), and tables showing incubation solution chemistry and analytical results (Tables S2-S4) are included in the Supplementary Information.

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V. DATA COLLECTION: 2018 BOREHOLE INSTALLATION, SAMPLING, AND GEOPHYSICS

In January 2018, HMC installed two boreholes next to wells DD and DD2 to investigate soil geology, geochemistry, and mineralogy using a variety of analytical techniques and geophysical methods. The goal was to further investigate whether uranium concentrations in groundwater near groundwater monitoring wells DD and DD2 are naturally derived or from mining, milling, or other anthropogenic sources. An additional objective of this work was to calibrate the geophysical results (gamma logs) with direct laboratory analysis of soil samples.

The two boreholes were advanced using rotosonic drilling methods, and detailed lithological logging was conducted per the Unified Soil Classification System by a geologist. Each borehole location was positioned as close to the associated groundwater monitoring well as feasible (Figure 7). Borehole DD-BK was located approximately 10 feet southeast of well DD with a total depth (TD) of 85 feet, and borehole DD2-BK was located approximately 40 feet northeast of well DD2 with a TD of 100 feet (Table 2).

Soil samples were collected and submitted for laboratory analysis of geochemical and mineralogical parameters including uranium content. The boreholes were installed as blank wells with solid polyvinyl chloride (PVC) risers (no screen), and downhole geophysical logging was performed. The data obtained from lithological logging, uranium content, geochemical and mineralogical parameters, and geophysics were correlated and have been used to refine the interpretation of the geophysical data collected by the USGS in 2016 at wells DD, DD2, Q, ND, MV, and T-11. The borehole and geophysical data were evaluated, comparing lithological and geophysical variations and uranium concentrations with depth.

Soil Sampling and Laboratory Analysis

A Ludlum 2241 ratemeter with a 44-9 pancake detector was used to record soil radioactivity in the field. Soil samples were selected based on lithology, geophysical data, and radiation detector results. Samples were collected from a variety of lithologies from the unsaturated and saturated zones, above and below the groundwater table.

The geochemical and mineralogical analyses are summarized in Table 4. The samples collected are summarized in Table 5; ten samples were collected from borehole DD-BK, and nine samples plus a duplicate were collected from borehole DD2-BK. All samples were submitted to Energy Laboratories, Inc (ELI) for analysis of uranium and metals content and leachability by an alkaline extraction per Kohler et al. 2004. This alkaline extraction was conducted as a Synthetic Precipitation Leaching Procedure (SPLP) via USEPA Method 1312 (USEPA 1994) with a solid sample to extraction fluid ratio of 1:20 where the combined sample and fluid are rotated at 30 rotations per minute for 18 hours. The extraction fluid used here consisted of a modified alkaline sodium bicarbonate extraction fluid (Kohler et al. 2004) instead of the standard acidic extraction SPLP fluid. A Level II data validation was performed for 100 percent of the analytical data, and a Level IV data validation was performed for 10 percent of the analytical data.

Nine samples were analyzed by ACZ Laboratories in Steamboat Springs, Colorado for grain size distribution. Based on the results of the geochemical analyses, Arcadis selected eight samples for optical mineralogy, x-ray diffraction (XRD), and scanning electron microscopy with energy-dispersive x-ray spectroscopy (SEM-EDS) to be completed by DCM Science Laboratory (DCM) in Lakewood, Colorado.

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Geophysical Assessment

Borehole geophysical logging was included to: a) quantitatively and graphically contextualize the soil descriptions and geochemical results; b) provide insight into the stratigraphy and allow an objective means of correlating between boreholes including the wells that the USGS logged in 2016, particularly important due to the inconsistent and undetailed descriptive information obtained during the drilling of existing wells; c) yield direct, in-situ estimation of the concentration of total uranium in the formation; d) guide decision-making about mineralogical analysis of samples. The geophysical assessment activities consisted of collection of geophysical parameters through the operation of borehole geophysical probes and post-fieldwork data processing of the raw field data. The types of data obtained included natural gamma ray, spectral gamma ray (static and dynamic), and induction conductivity. Additional details can be found in the Supplementary Information.

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VI. RESULTS AND DISCUSSION

Water Quality and Comparison of Results between HMC and USGS

Major Cations and Anions

Major cations (calcium, magnesium, sodium, potassium) and anions (carbonate/bicarbonate alkalinity, chloride, and sulfate) were analyzed in all VP samples, and results are presented in Table 6. Major cations and anions provide the basis for understanding the geochemical regime of a groundwater system and can be used to correlate water types and to trace the origins of groundwater. Piper and Stiff diagrams were developed to display major cation and anion data.

Piper Diagram

As shown on Figure 8, data from the 2016 SSE show that far upgradient alluvial well 920 plots in the same region as near upgradient alluvial wells DD, DD2, P-3, and Q in the upper diamond portion of the diagram. This region is characterized by high calcium, sodium, and sulfate water. Well ND, which is the only other near upgradient alluvial well sampled, is located on the east side of the East Fault and shows a geochemical signature that is distinct from all other alluvial wells sampled in this event, likely due to its proximity on the east side of the channel; this position makes it likely to receive more groundwater recharge from low-solute snow melt from neighboring Mount Taylor. Water in this area is characterized by moderate sodium, magnesium, and sulfate and low calcium.

Alluvial wells within the immediate vicinity of the site show highly variable geochemical signatures. Alluvial well T-11 is located directly within the LTP and exhibits the highest TDS and some of the highest sodium concentrations of the wells sampled this event. T-11 plots in the region of the Piper diagram characterized by low calcium and high sodium, bicarbonate, and sulfate. Well MV (located west of the LTP and near the Pleasant Valley Estates) exhibits high calcium, sodium, and sulfate water. Alluvial well ST is physically located between T-11 and MV and plots directly between them with low-moderate calcium and moderate-high sodium.

Upper Chinle wells CE7, CW18, and CW50, and wells screened in the Middle Chinle (ACW, CW1, CW15, CW2, and CW28) plot within a similar geochemical regime to near upgradient well ND and are characterized by high sodium, magnesium, and sulfate and low calcium. Middle Chinle well CW45 plots near Lower Chinle well CW37 (but is separate from the other the Middle Chinle wells) and is characterized by moderate calcium and high sodium and sulfate.

Waters present farther upgradient from the mill in the San Mateo Creek Basin, containing elevated levels of COCs, have been characterized for their major ion chemistry (Gallaher and Cary 1986). Surface water in San Mateo Creek (a natural perennial stream only in its upper reaches, and which becomes ephemeral approximately one mile downstream of the town of San Mateo [Gallaher and Cary 1986]) was dominated by calcium and bicarbonate due to flow through a limestone terrain, with much lower sulfate than that present in the alluvium near the site. Other surface water known to be unaffected by local mining impacts (Rio Moquino) was closer in major ion chemistry to the alluvium near the Grants Reclamation Project. In contrast, mine-affected surface water had a very different calcium/sulfate signature than the alluvium near the Grants Reclamation Project. The major ion signature of the groundwater to the north within the Arroyo del Puerto (in the middle of the upper San Mateo Creek Basin) and upper San Mateo Creek, have a

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distinctly different major ion composition relative to the groundwater in alluvium near the site (Gallaher and Cary 1986).

Stiff Diagrams

Stiff diagrams are a method of plotting anions and cations such that the magnitudes of each constituent form a polygon. The shape of the Stiff diagram can be used for visual comparison of the water chemistry. Stiff diagrams plotted on a map show geographic variability in groundwater geochemistry.

Three dominant geochemical composition groups are identified from the 2016 SSE data (Figure 9). The first group exhibits a predominance of sulfate, moderate calcium, and low chloride and alkalinity. This calcium-sulfate group is consistent throughout near and far upgradient alluvial wells (920, DD, DD2, P-3, Q) except for ND. Upper Chinle well CW50 also falls within this group. The second group is characterized by predominance of sodium/potassium and sulfate and low calcium, magnesium, chloride, and alkalinity. This sodium, potassium-sulfate composition is associated primarily with the Middle Chinle wells ACW, CW1, CW15, CW2, CW28, and CW45; near upgradient well ND; and Lower Chinle well CW37. The final geochemical composition group includes wells located in or immediately downgradient of the LTP (T-11, ST, CE7). This group consists of a classic "anvil" shape with a predominance of sodium/potassium and sulfate. Calcium, magnesium, chloride, and alkalinity are moderate.

Upgradient alluvial wells 920, P-3, Q, DD, and DD2 have similar Stiff diagrams and group closely on the Piper diagram, indicating that are similar in water chemistry. These upgradient alluvial wells plot separately from other alluvial wells (Figure 9).

Stiff diagrams prepared for groundwater samples from the upper San Mateo Creek Basin (NMED 2010) show the predominance of calcium, sodium, and sulfate ions, and a distinct difference between alluvial and bedrock wells in this area. SMC-13 (well 920) and SMC-8 (ND) were evaluated in this earlier work and were shown to have a major ion composition similar to those generated from the 2016 SSE (Figure 9). As discussed above, the major ion composition in the alluvium near the Grants Reclamation Project is a result of the alluvial sediment mineralogy and hydrogeological conditions, with general similarity across the lower San Mateo Creek Basin at well 920 and southward; therefore, the groundwater moving in from upgradient that contains elevated concentrations of COCs is better evaluated by the presence of key trace elements such as molybdenum and selenium.

Other work in the upper San Mateo Creek Basin was performed by the USEPA as part of the Expanded Site Assessment (Weston Solutions 2016). The scope of work for this investigation was to locate and characterize natural background quality of alluvial groundwater upgradient of former mines in the Ambrosia Lake area. This Expanded Site Assessment (Weston Solutions 2016) was unable to develop relevant water quality data for locations upgradient of the former mines due to absence of alluvial groundwater. Three wells were established in the northeasterly area of the basin where the alluvium is recharged by runoff from Mount Taylor. The three wells (BG-03, BG-04, BG-05) had very low sulfate (13 to 76 mg/L), TDS (310 to 620 mg/L), uranium (0.003 [estimated value] to 0.016 mg/L), and selenium (<0.021 to 0.023 mg/L [estimated value]). While the alluvial groundwater here was evaluated in an attempt to characterize natural background for all areas downgradient, these three background wells are not relevant to the alluvial groundwater system at the Grants Reclamation Project due to their distance and the very different depositional environment and hydrogeological conditions. Areas around Mount Taylor have not been shown to contain much mineralized uranium (hence the lack of mines in these

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areas); as a result, uranium concentrations are low on the eastern side of the basin and are not representative of conditions throughout the rest of the basin that are dominated by eroded materials and water that has been in contact with mineralized uranium deposits (Dillinger et al. 1990, Weston Solutions, Inc. 2016). Accordingly, the Weston Solutions (2016) work stated that the natural background quality of the alluvial aquifer would vary across the basin as the mineralogical composition of the alluvium varied, with detritus from local bedrock outcrops deposited in the drainage basin and influencing water quality.

Other wells evaluated as part of this work were wells downgradient of the former uranium mines, and included C-3, a well screened from 80 to 90 feet adjacent to San Mateo Creek. At C-3, uranium was measured at 0.11 mg/L, selenium was 0.29 mg/L, TDS was 2200 mg/L, and sulfate was 1,200 mg/L (estimated). The water quality at this location is very different than the groundwater in the upgradient Grants Reclamation Project background wells, providing support for the fact that water quality in the Grants Reclamation Project background wells is dominated by the mineralogical and geochemical characteristics closer to the Grants Reclamation Project.

Regional Trace Elements and Radionuclides

To evaluate the spatial distribution of three primary constituents (molybdenum, selenium, and uranium), magnitude plots were constructed from the 2016 SSE data. These plots show the total (unfiltered) concentrations from VP samples in terms of scaled circles representing the set ranges of concentrations.

Molybdenum concentrations in samples collected during the 2016 SSE varied from <0.001 mg/L at well 920 to 24.9 mg/L at CE7. Total molybdenum concentrations in groundwater were greatest near the LTP with wells ST, T-11, and CE7, exhibiting concentrations ranging from 6.21 mg/L to 24.9 mg/L (Figure 10). Other wells sampled during the 2016 SSE generally exhibited concentrations of less than 0.1 mg/L molybdenum; notably, molybdenum was present at a very low concentration (<0.001 mg/L) at far upgradient alluvial well 920. In addition to a marker for groundwater moving in from upgradient that contains elevated concentrations of COCs, molybdenum can be used as a marker for leachate from the LTP. Molybdenum concentrations in groundwater drop to almost non-detect levels north of the LTP, indicating that LTP leachate has not affected near upgradient alluvial wells P-3, ND, Q, DD, or DD2, or far upgradient well 920.

Characterization of water in mines in the north of the San Mateo Creek Basin shows that molybdenum was present at high concentrations (average of 0.8 mg/L) (Gallaher and Cary 1986). Elevated concentrations of molybdenum are associated with groundwater in contact with mined uranium ore. The concentration of molybdenum in groundwater in the alluvium upgradient of the Grants Reclamation Project was very low in 2016 indicating that water associated with mined uranium ore is not present close to the site. Molybdenum, present as the molybdate anion (MoO_4^{-2}) in groundwater, sorbs poorly to aquifer soil. Its movement down the valley would be expected to be rapid under oxidizing to slightly reducing conditions. Should molybdenum move though a reducing zone, the potential for molybdenum to become retarded within the aquifer would increase due to its attenuation and/or precipitation at low oxidation-reduction potentials.

Selenium in samples collected during the 2016 SSE varied from <0.001 mg/L at well DD2 to 0.87 at well CE7. Total selenium concentrations in groundwater are greatest near the LTP in wells ST and CE7 and north of the LTP in wells 920, P-3, and Q (Figure 11). Selenium concentrations in the alluvial aquifer vary from non-detect at <0.001 mg/L at near upgradient alluvial well DD2 to 0.4 mg/L in near upgradient alluvial well Q. Selenium is known to be present within the uranium ores of the Grants Mineral Belt and

can substitute for sulfide in many of the reduced minerals (USGS 2017). Its presence at 0.27 mg/L in well 920 may be a marker of groundwater moving in from upgradient that contains elevated concentrations of COCs migrating down the alluvial channel (discussed below); however, it is highly variable throughout the basin, particularly on the west side of the channel with non-detect concentrations (<0.001 mg/L) at well DD2 and 0.11 mg/L at downgradient well DD. If the selenium were coming solely from groundwater flowing down the basin, DD and DD2 would be expected to have similar concentrations or upgradient well DD2 would be expected to have higher concentrations than downgradient well DD. This indicates that there may be local contribution to selenium in groundwater from selenium-bearing minerals and/or a variable groundwater flow path from the north. The remaining possibility is that selenium is naturally high in the basin due to leaching from naturally mineralized materials such as the selenium-rich deposits in Poison Canyon, upgradient of the Grants Reclamation Project.

Uranium concentrations in samples collected during the 2016 SSE varied from 0.0089 mg/L in the RO treated and blended water (SP2) to 16.5 mg/L in well CE7. Total uranium in groundwater is greatest near the LTP in wells CE7, T-11, and ST, ranging from 4.82 mg/L to 16.5 mg/L (Figure 12). Far upgradient alluvial well 920 exhibited the next highest uranium concentration, followed by wells DD2 and MV, north and west of the LTP, respectively. Uranium in the alluvial aquifer varied from 0.0188 mg/L in near upgradient alluvial well ND to 0.226 mg/L in far upgradient alluvial well 920. At well DD, uranium was 0.0869 mg/L, and at DD2 it was 0.221 mg/L, demonstrating the local variability in uranium concentrations on the west side of the alluvial channel.

Selenium concentrations are highest immediately surrounding the LTP but are also high in wells far to the north. The uranium concentration seen in well 920 is consistent with concentrations in ore-bearing regions to the north, where groundwater is in contact with the uranium-bearing Morrison Formation. As uranium is more reactive than selenium, uranium movement tends to be retarded due to interactions with aquifer soil. This was also reflected in the laboratory testing of the PDSs (results discussed below), where uranium accumulated on the plastic mesh through adsorption, but selenium was never detected on the mesh. As has been shown by Hydro-Engineering, selenium- and uranium-bearing water may be approaching the site from the north, but it has not yet reached the Grants Reclamation Project (Hydro-Engineering 2018). As of 2016, far and near upgradient alluvial wells 920 and R were affected by this upgradient water, as represented by the concentrations of labile selenium; however, the front had not yet reached wells DD, DD2, or P-3. This shows that wells DD and DD2 are unaffected by groundwater moving in from upgradient that contains elevated concentrations of COCs and are representative of the regional natural background conditions.

Comparison of Data from Each Sampling Method

Data from the VP, MP, and PDSs generally do not agree (Figure 13). While the PDSs were consistently lower in concentration than either the VP or MP samples, the MP and VP varied unsystematically with respect to each other between samples. To examine these differences, line plots and box and whisker plots (box plots) were constructed. Two box plots were constructed for each well. The first includes the results of all PDSs (all depths) from the given well as one box plot; results from the MP sample and VP sample are overlain on the PDS box plot so that variability between sampling methods can be evaluated. The second box plot puts the results of the 2016 SSE in context of all available historical data from each well that, in most cases, spans decades. Figure 14 shows box plots for total uranium and selenium for well DD; box plots for the other locations where PSDs were employed (DD2, MV, ND, Q, T-11) are provided on Figures S7 through S11. In all cases where PDSs were deployed, and where the constituents

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were detected, MP and VP samples returned higher concentrations of uranium and selenium (often by an order of magnitude or more) than the PDSs at all depths. The variability in data resulting from the use of three different sampling methods stresses the importance of understanding the mechanics of a sampling technique, how each is biased, and what part of the well or aquifer each technique actually samples.

Due to their very nature as boreholes connecting the land surface and atmosphere to the subsurface environment, wells create artificial microenvironments within the aquifer (Puls and Barcelona 1996). Geochemically, this can have major effects on the state of metals and other constituents, especially constituents that are pH or redox sensitive. Exposure to gases such as oxygen and carbon dioxide at atmospheric concentrations which may be greater or less than that which is already dissolved in the aquifer water can raise or lower the pH (due to carbon dioxide off-gassing or absorption) or raise or lower the ORP (due to oxygen off-gassing or absorption). For redox-sensitive and pH/alkalinity-sensitive metals such as selenium and uranium, this can result in an artificially inflated or depressed concentration within the well. This phenomenon has been well-documented (Appelo and Postma 2006), and as a result, the standard VP method has become the preferred practice for many because it removes the water within the well that may be artificially influenced.

The MP technique is designed to directly sample the water inside of a well at a discrete depth and a discrete point in time with minimal purging. The MP technique is applicable primarily in environments where well recharge is low. The MP technique is not subject to biases due to "pulling" water from low-transmissivity zones in the aquifer as can happen when using the VP method described below. However, because the MP collects a direct sample of undisturbed water in a well, it is subject to biases due to the geochemical microenvironment inside wells. In theory, the MP sample at a discrete depth should be sampling essentially the same water as a PDS deployed at that same depth, acknowledging that the PDS could be slightly different because it contains water from its entire deployment period. The MP, in this sense, is considered a verification sample for the PDS to indicate if complete equilibration has occurred.

PDSs are designed to directly sample the water inside of a well without purging. This method eliminates concerns surrounding "pulling." PDSs are theoretically capable of mapping the vertical variation in dissolved constituents in the water column; these variations are due either to leaching and diffusion of constituents in heterogeneous lithologies and mineralogy immediately surrounding the well screen or to differential groundwater flow through the heterogeneous lithologies and differing hydraulic conductivities.

PDSs are also subject to biases due to the geochemical microenvironment that exists inside wells. The data that PDSs collect constitute a time-weighted average of the conditions and concentrations that occurred in the well over the entire deployment, so they are not directly comparable to discrete samples from one single point in time. The data from the 2016 SSE show that the PDSs collected many times lower concentrations of constituents when compared to either the MP or VP samples. In fact, PDS results (excluding non-detect values) for selenium were generally 1.5 to more than 11 times lower than the VP, and results for uranium were generally 3 to 19 times lower than the VP collected at the same depth. When the MP sample data are compared to PDS data, PDS results (excluding non-detect values) for selenium were 1.5 to almost 24 times lower, and results for uranium were approximately 3 to 7 times lower than MP samples collected at the same depth, signaling that equilibration of PDSs did not occur..

The standard VP is designed to remove all water from the well and from the three-dimensional area of the aquifer immediately surrounding the well that might be affected by the presence of the well itself. The act of pumping is suspected to introduce artificial "pulling" effects within the surrounding aquifer, which can

ultimately affect constituent concentrations. Pumping induces flow gradients that may not normally exist in the subsurface, which can lead to artificially high transmissivity and movement of water from low-permeability zones such as clay deposits. Clays have the potential to accumulate and store high concentrations of metals, and pore water stored in and surrounding clays can harbor higher constituent concentrations than can be found on average in an aquifer. Pumping can pull high-concentration water from these zones, ultimately leading to higher constituent concentrations in volumetrically purged groundwater samples than in groundwater sampled by no-purge methods such as MP or PDSs. While this may seem to be misrepresentative of the conditions of the aquifer, it is important to acknowledge that the vast majority of the water used from groundwater systems is accessed through pumping, whether for irrigation, industrial use, or drinking water. Groundwater quality should be evaluated based on a sampling method that is representative of the dominant technique used to provide water such as pumping.

Comparison of Key Constituents with Historical Data

Box plots were constructed to compare the 2016 SSE data with historical site data (discussed above, Figure 14 and Figures S7–S11). When compared to the historical data, which spans as far back as 1997 for all wells evaluated here except DD2 (begins in 2008) and T-11 (begins in 2004), the PDS data are very low and fall far below the range of the historical data for both uranium and selenium in all wells except for selenium in well DD. In well DD, the range of selenium measured in the PDSs was higher than the historical range of data. The 2016 SSE MP and VP sample data generally fall within the range of the historical data. One notable exception is well DD, which yielded MP and VP uranium data approximately 50 percent lower and selenium data approximately 75 percent higher (MP) and 65 percent higher (VP) than the mean of the historical body of data for well DD. The 2016 USGS sample from well DD represents atypical and arguably unrepresentative results for uranium and selenium. Well Q MP and VP data for selenium fell above the range of historical data. The MP results represent a total metals measurement (a sample of dissolved metals was not collected), while the historical data and VP data represent dissolved metals data (total metals data are not available in the historical data); generally, the MP results (total metals) would be higher than the dissolved results from the historical data or the VP data, but this is not always the case. The discrepancies between the results from this study and the historical data imply that the 2016 SSE may have employed sampling techniques that varied from the standard techniques used to sample wells at the Grants Reclamation Project, though how they varied is not known.

Comparison of HMC Data with USGS Data

Data generated from HMC split samples and USGS split samples were compared and in general, showed little variability. Details of this data comparison can be found in the Supplementary Information.

Isotopes, Dissolved Gases, and Dating

As part of the 2016 SSE, groundwater samples and one RO system sample were collected for analysis of environmental tracers. Environmental tracers analyzed included:

- Stable oxygen and hydrogen isotopes of water
- Stable sulfur isotopes of sulfate
- Stable oxygen and nitrogen isotopes of nitrate

- Stable carbon isotopes of dissolved inorganic carbon (DIC)
- Radioactive carbon-14 (^{14}C) activity of DIC
- Radioactive tritium (^{3}H) in water (Figure S16; detailed in Supplementary Information)
- Chlorofluorocarbons (CFCs) (detailed in Supplementary Information)

These environmental tracers were evaluated to gain additional insight into the source of water and solutes in groundwater and to estimate the "age" of groundwater. Results of these evaluations are summarized below. Background information on isotope analysis, more detailed discussions of results, and references and figures associated with the text below are provided in the Supplementary Information.

Stable Oxygen and Hydrogen Isotopes of Water

The stable isotopic composition of oxygen and hydrogen in water can be used to identify primary recharge source(s) for groundwater and surface water (e.g., snowmelt versus rainfall) and potential secondary effects due to evaporation or water-rock interactions. The primary goal of measuring stable isotopes of water for site groundwater samples was to assess recharge conditions and to identify water that may have been affected by evaporation of tailing water from the LTP.

Most site groundwater samples plotted along a local meteoric water line (LMWL) with a slope of approximately 7.1 (Figure S12). The slope of 7.1 for the LMWL is typical for arid environments (Ingraham 1998). Samples T11 (Alluvial Aquifer), CE7 (Upper Chinle Aquifer), and SP2 (1:1 blended RO system permeate and SAG water) plot away from the LMWL with a slope of approximately 4.2, suggesting that water at these locations has undergone substantial evaporation from the LTP. Lower Chinle Aquifer sample CW37 also plotted away from the LMWL, suggesting that water in the Lower Chinle Aquifer at this location has undergone evaporation before recharging the Lower Chinle aquifer.

Groundwater samples collected at locations upgradient from the LTP, including alluvial aquifer wells DD, DD2, P3, and Q, Upper Chinle aquifer well CW50, and Middle Chinle aquifer wells CW1 and CW2 had water stable isotope compositions that fell along the LMWL and did not indicate influence of evaporated water from the LTP. There was substantial variation in the stable isotopic composition of upgradient alluvial aquifer groundwater samples. For example, the well 920 sample plotted within the range of Middle Chinle samples, while ND plotted separately from other upgradient alluvial groundwater locations DD, DD2, Q, and P3 (Figure S12). These results indicate that multiple sources of recharge contribute groundwater to the alluvial system, and that groundwater in the alluvium is not uniform in composition.

Sulfate

Groundwater samples were analyzed for sulfate concentrations and sulfur $\delta^{34}S$ values to gain insight into possible sources of sulfate in groundwater. Oxidation of pyrite present in uranium-containing minerals may release sulfur (in the form of sulfate) and may increase mobility of uranium associated with the pyrite. Dissolution of gypsum, or other by-products of sulfide oxidation, may also release sulfate to groundwater. In addition, sulfuric acid was used during the uranium milling process (HMC 2012) and may be a source of sulfate to groundwater.

Values of $\delta^{34}S$ range from about +10 per mille (‰) to 30‰ in ocean water and evaporite minerals such as gypsum, while negative $\delta^{34}S$ values of -50‰ to +5‰ are typical of diagenetic environments where

reduced sulfur compounds are formed (Clark and Fritz 1997). Jensen (1958) demonstrated that sulfur associated with uranium ores had $\delta^{34}S$ values ranging from -48‰ to 12‰; however, most values were strongly negative. Fishman and Reynolds (1982) reported $\delta^{34}S$ values ranging from -41.6‰ to -29.4‰ for pyrite associated with uranium ore samples collected from the Mariano Lake New Mexico uranium ore deposit. Robertson et al. (2016) state that sulfuric acid was used during ore processing at most uranium mills and may have $\delta^{34}S$ values ranging from -8‰ to 32‰.

Sulfate $\delta^{34}S$ values for site groundwater samples ranged from -30.4‰ to 7.7‰ and sulfate concentrations ranged from 244 to 4,670 mg/L (Figure 15). Groundwater samples collected from upgradient of the LTP (CW-50, DD, DD2, P-3, Q, and 920) had $\delta^{34}S$ values ranging from -30.4‰ to -25.5‰ and sulfate concentrations ranging from 931 to 2,330 mg/L. The $\delta^{34}S$ values less than -25‰ for these upgradient groundwater samples suggest that sulfate was derived from oxidation of a reduced sulfur form such as pyrite. Pyrite is present in alluvial aquifer sediments, most likely derived from mineralized bedrock (discussed below). The San Mateo Creek system intersects a mineralized zone of the Morrison Formation upgradient from well 920.

Nitrate

Groundwater samples were analyzed for the stable nitrogen (^{15}N) and oxygen (^{18}O) composition of nitrate to identify potential controls of nitrate on uranium mobilization. The interaction of oxidants such as nitrate can result in the oxidation and mobilization of reduced uranium species (Paradis et al. 2016). Potential sources of nitrogen compounds, either including nitrate or having the potential to generate nitrate, in site groundwater include ammonia used during the uranium milling process (HMC 2012), animal waste, local septic systems, and naturally occurring nitrate from atmospheric deposition and soil.

In arid environments, naturally produced nitrate may accumulate in shallow soil due to evaporation of infiltrating precipitation water before reaching groundwater. Leaching of this nitrate source can result in groundwater nitrate concentrations as high as 2 mg/L (Nishikawa et al. 2003). Nitrate (as N) concentrations greater than 10 mg/L commonly occur in groundwater beneath and downgradient from septic systems (e.g., Nishikawa et al. 2003, Verstraeten et al. 2004, McQuillan 2004, Esser et al. 2010).

Groundwater sample $\delta^{15}N$ values ranged from 7.0‰ to 23.3‰ and $\delta^{18}O$ values ranged from 3.2‰ to 8.9‰. These nitrate $\delta^{15}N$ and $\delta^{18}O$ values fall within the expected range for natural soil nitrate and for sewage and manure (Figure S13). Groundwater nitrate concentrations ranged from below the laboratory detection limit of 0.1 mg/L at CW50 and DD2 to 16 mg/L at DD and Q. These results suggest that nitrate in site groundwater is derived primarily from manure or septic sources because many locations had nitrate concentrations greater than 2 mg/L, which is higher than expected for natural soil source. Based on nitrate $\delta^{18}O$ values less than 10‰, nitrate from nitrate-based fertilizer or from industrial processes that use nitrate-based reagents (e.g., nitric acid or nitrate-based explosives) is not indicated.

Groundwater in a well far north of the site called SMC-24, drilled to a depth of 170 feet bgs and screened within the Morrison Formation, had 20.2 mg/L nitrate in 2009 (NMED 2010). This nitrate was likely due to the presence of residual nitrate from the use of explosives during underground mining (Revy 1996). Nitrate in oxic waters can be fairly conservative (with limited sorption and biological degradation, especially when oxygen is present). While nitrate is a marker of mine water, the nitrate at wells DD and DD2 is demonstrated through isotopic analysis not to be derived from explosives, indicating that the nitrate there is not related to mine water.

Alkalinity and Dissolved Inorganic Carbon

Groundwater samples were analyzed for the stable carbon isotope composition (^{13}C) of DIC and alkalinity concentrations to gain insight into groundwater inorganic carbon geochemistry. Sodium carbonate and sodium bicarbonate were used during the uranium milling process (HMC 2012), and uranium can form complexes with carbonate in oxygenated groundwater with high carbonate content (ATSDR 1999). The DIC $\delta^{13}C$ composition and alkalinity concentrations were also used to support interpretation of groundwater DIC carbon-14 (^{14}C) age dating results, as described below.

Freshwater carbonates typically have $\delta^{13}C$ values that range from approximately -18‰ to 5‰, although the entire range of $\delta^{13}C$ values is from about -30‰ to 18‰ (Clark and Fritz 1997). Fishman and Reynolds (1982) reported $\delta^{13}C$ values of -18.8‰ to -7.4‰ for carbonates associated with uranium ore samples collected from the Mariano Lake, New Mexico uranium ore deposit, with most samples having $\delta^{13}C$ values greater than -12.5‰. Groundwater DIC $\delta^{13}C$ values have been measured between about -20‰ to 0‰, with values as high as 15‰ reported (Clark and Fritz 1997).

The $\delta^{13}C$ values of DIC in site groundwater samples ranged from -21.7‰ to -3.2‰. Most groundwater samples had DIC $\delta^{13}C$ values greater than -10‰ and alkalinity concentrations between 173 and 592 mg/L as calcium carbonate (Figure S14). The higher alkalinity concentrations and more negative DIC $\delta^{13}C$ values for samples ST, CE7, and T11 indicate that the LTP is a likely source of DIC to groundwater near the LTP, and this DIC source has a DIC $\delta^{13}C$ value that is equal to or more negative than -21.7‰. Groundwater samples collected from upgradient alluvial aquifer wells DD, DD2, ND, P-3, Q, and 920 have distinctly different DIC $\delta^{13}C$ values and alkalinity concentrations compared with the three wells influenced by the LTP; ST, CE7, and T11 (Figure S14). These results indicate that the LTP likely does not contribute DIC and alkalinity to upgradient alluvial aquifer groundwater.

Carbon-14

Groundwater samples were analyzed for the activity of carbon-14 (^{14}C) in DIC as a potential groundwater age dating tool. The ^{14}C age dating technique is an indirect method for age dating of water that is typically used to date groundwater recharged more than 60 years ago and relies on the presence of inorganic and organic carbon in the water. ^{14}C, or radiocarbon, is a radioactive isotope with a half-life of approximately 5,730 years (Clark and Fritz 1997). Measured ^{14}C activities are normalized to the international standard known as "modern carbon" (mC) and are reported as percent modern carbon (pmC).

Site groundwater samples had ^{14}C activities ranging from 14.39 to 85.17 pmC, indicating presence of groundwater that is thousands of years old (Figure S15). Alluvial aquifer groundwater wells upgradient from the LTP (ND, P3, Q, DD, and DD2) and Lower Chinle well CW37 had higher ^{14}C activities (greater than 40 pmC) compared with wells downgradient from the LTP. Upper Chinle wells CW50 and CE7 also had higher ^{14}C activities compared with downgradient wells. These results suggest that groundwater in wells upgradient from the LTP and Lower Chinle groundwater in the vicinity of CW37 have a greater modern component of groundwater compared with other monitoring locations.

Isotopic Uranium Analysis

Uranium isotopes, including U-234, U-235, and U-238, were measured in groundwater during the 2016 SSE. Naturally occurring uranium is composed of 99.28 percent U-238, 0.0058 percent U-234, and 0.71 percent U-235 (Eisenbud 1987). The activity ratio of U-234 to U-238 in groundwater is a useful

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measurement to determine the source of uranium to groundwater. The UAR in rock material or in water resulting from acidic or alkaline milling has an isotopic ratio of 1 or very near 1. This is due to secular equilibrium achieved between U-238 and its high specific activity daughter radionuclide U-234. In acidic or alkaline milling processes, all of the isotopes of uranium are leached at the same rate. This is in contrast to uranium that enters groundwater due to natural weathering of uranium-bearing minerals, which undergo preferential leaching of U-234 and have a UAR greater than 1 (and can be as high as 2 and above). It has been documented in the literature that because U-234 is very radioactive (6.2 milliCuries per gram [mCi/g], orders of magnitude more radioactive than U-238), it is chemically unstable and more prone to dissolve into groundwater relative to U-238 (Dosseto et al. 2008). This results in more U-234 than U-238 in the groundwater and generates UARs greater than 1.

Figure 16 provides the results of the UAR plotted against the dissolved uranium concentration. The tailing water has a UAR of 1.2 or lower (generally close to 1) as demonstrated by ST, T11, and CE7. This is consistent with other work at a uranium tailing in Cañon City, Colorado, where the UAR of raffinate was measured at 1.0 to 1.1, and background groundwater was 1.3 and higher (Zielinski et al. 1997). Groundwater from wells DD and DD2 had a UAR of approximately 1.5, and other upgradient wells were greater than 1.2. The majority of the Chinle Formation wells all had UARs greater than 2.0, demonstrating that the source of uranium there is the slow weathering of uranium minerals in the Chinle aquifer. The alluvial well MV (which is downgradient of the LTP) and Chinle wells CW45, and CE7 also showed a UAR less than 1.2, indicating that the tailing water is the likely source of uranium to these locations. The uranium in the Upper Chinle well CW50 is likely from the tailing, however the UAR here does not clearly indicate the source of uranium.

Isotopes, Dissolved Gases, and Dating Conclusions

Multiple lines of evidence, including stable isotopes of water, stable isotopes of nitrate, sulfate concentrations and stable sulfur isotopes, ^{14}C activity of DIC, and tritium results (included in Supplementary Information), demonstrate compositions of upgradient alluvial aquifer groundwater which is distinctly different from groundwater affected by the LTP. These results demonstrate that the upgradient alluvial aquifer groundwater is not affected by the LTP. In addition, nitrate isotope and UAR data strongly support that key wells, including DD and DD2, have not been affected by groundwater moving in from upgradient that contains elevated concentrations of COCs. Heterogeneity of environmental tracer composition within the alluvial aquifer groundwater upgradient from the LTP indicates multiple sources of recharge, including meteoric water infiltration and low-solute snowmelt runoff from the Mount Taylor area to the east, and non-uniform flow through the alluvial aquifer system.

Passive Diffusion Sampler Laboratory Testing Results

The PDS laboratory testing showed that the constituents equilibrated at different rates (Table S3, Figure S4). By week 4 (the deployment period most similar to that of the field event), equilibration of all four analytes was firmly within the exponential phase of equilibration, and none had begun to reach steady state; dissolved potassium, sodium, selenium, and uranium reached 105, 94, 57, and 72 percent diffusion versus the fully mixed simulated groundwater solution. By week 8, all analytes had surpassed 100 percent diffusion except for dissolved selenium at 84 percent. Values higher than 100 percent diffusion are due to the lack of equilibration achieved by the earliest samplers, which were removed from solution

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and ultimately resulted in higher simulated groundwater solution solute content than would have been achieved if full equilibration occurred before the samplers were removed.

Electrical conductivity, a proportional proxy for rate of equilibration, increased gradually from 24 hours to week 1 (with an average of 235 microSiemens per centimeter per week [µS/cm-week]), steeply from week 1 to week 4 (659 µS/cm-week), again gradually between weeks 4-6 (361 µS/cm-week), and plateauing between weeks 6 and 8 to 260 µS/cm-week (Table S4, Figure S5).

Analytes bound to the nylon mesh generally increased in concentration over the sampling period (Table S5, Figure S6). Bound analyte concentrations were normalized by subtracting the amount of each analyte present in the unused mesh from the amounts measured in/on the test mesh. Bound potassium concentrations varied from 125 milligrams per kilogram of mesh (mg/kg) at week 1 to 232 mg/kg (week 4). Sodium concentrations varied from 0 mg/kg (week 1; actual calculated value was -13 mg/kg, likely because sodium content of the mesh is variable) to 762 mg/kg (week 4). Selenium was not detected above 1 mg/kg. Uranium concentrations varied from 2 mg/kg (24 hours, and weeks 1 and 8) to 5 mg/kg (week 4). The mesh's ability to bind metals decreases these samplers' fidelity as a truly passive sampling method and calls into question their ability to faithfully represent aquifer geochemistry.

Time Required for Equilibration

By week 4, between 70 and 86 percent of the target concentrations of total metals were achieved through diffusion for the four analytes; full equilibration was not obtained. Due to the mixing effects described above, these percentages are likely slightly higher than the actual values. The PDSs modified from the ones designed and developed by Vroblesky et al. (2002) and selected for use by the USEPA and USGS during the 2016 SSE did not collect samples that were representative of the water they were designed to sample. It is possible that changing the dimensions of the sampler bottle from 30 mL to 250 mL could affect the time required for complete equilibration. The original design described in Vroblesky et al. (2002, 2003) used 30 mL bottles whose screened opening was roughly equivalent to the sampler's height; this allowed for a high screen surface area to volume ratio. The samplers modified by USGS and used in the 2016 SSE had a much lower screen surface area to volume ratio, and the height of the 250 mL bottles was much larger than the diameter of the screened opening. Because diffusion can be thought of as molecular movement over distance with an average molecular diffusion coefficient of 10^{-5} square centimeters/second in water (Hemond and Fechner-Levy 2000), increasing the distance from the screen to the opposite end of the bottle increases the time required for complete diffusion.

Complete or almost complete equilibration occurred in the laboratory tests after eight weeks of incubation. This appears to be the minimum amount of time required for deployment to obtain a sample that is potentially representative of the surrounding water.

Comparison to Vroblesky et al. (2002, 2003) on which the Samplers Were Modeled

The PDSs used in this work were a reproduction of the nylon-screen samplers tested by Vroblesky et al. (2002) and Vroblesky et al. (2003). Vroblesky et al. (2002) noted that the nylon-screen PDSs showed substantially lower calcium, sulfate, and certain redox-sensitive constituents like iron than seen in either low-flow or MP samples. Vroblesky et al. (2002) suggest that these discrepancies could be: a) "attributable to well-specific factors and not related to sampler efficiency."; b) due to different lithologies at

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the immediate depths of the deployed samplers (where water surrounded by a low hydraulic conductivity zone like a silt lens is accurately sampled by a PDS, but not by a pumped sample because the water for the pumped sample will come from higher hydraulic conductivity zones above and below the silt and will not be representative of the water normally present at the target depth); c) might be due to infiltration of meteoric water from the surface; or d) is possibly an effect caused by the fact that well water could be oxygenated even if aquifer water is not. Factor a) indicates that the authors have no evidence to suggest that the samplers would be at fault for the inaccurate data; however, they have no evidence that the discrepancy in the data is not due to the PDSs themselves. Factor b) is the strongest argument in favor of using discrete-depth PDSs: they help us understand the heterogeneities that exist in an aquifer system. However, virtually all water removed from an aquifer system for use above ground is done so via pumping, so while the subsurface heterogeneity is informative from an academic standpoint, it is not useful in terms of understanding the potential exposure that humans, animals, plants, or open land would experience due to use of water from a particular aquifer. Factors c) and d) exemplify the reason that the standard VP method exists: to take a representative sample of aquifer water that is neither dominated by artifacts or geochemical microenvironments specific to the well.

In further work by Vroblesky et al. (2003), the nylon-screen samplers were able to document stratification in the well's water column; however, the samplers did not replicate results from other sampling methods. Nylon-screen samplers showed lower chloride concentrations than either dialysis bag or pumped samples at chloride concentrations greater than 35 mg/L. A subsequent laboratory test indicated that this might be due to too small of a mesh size; a 47-micron (µm) mesh was used (Vroblesky et al. 2003) versus the 125 and 250 µm mesh used in previous work (Vroblesky et al. 2002). This work showed that results from the PDSs were unreliable, even to geochemically inert constituents such as chloride.

Additional review of the samplers used in Vroblesky et al. (2002, 2003) indicates that PDS orientation could play a role in the speed of equilibration, with some work suggesting that samplers oriented with the opening toward the side of the well casing equilibrate more quickly than samplers oriented with the opening upward or downward (ITRC 2005). Samplers deployed in the 2016 SSE were configured with their opening downward and fixed in place using the flexible netting that held the samplers in a vertical column.

In both of their papers (Vroblesky et al. 2002, 2003), it is stressed that PDSs should not be used to quantify constituents that are redox sensitive because redox effects within the well can affect constituent solubility; this effect results in PDS samples and data that are not representative of the aquifer geochemistry. Of the constituents measured during the 2016 SSE, arguably the two most important constituents are selenium and uranium, both of which are redox sensitive, and their solubilities and sorption capacity are dependent on their redox state.

Geophysics at Wells and Boreholes

Geophysics at 2016 SSE Wells

The USGS collected borehole geophysical data from six monitoring wells completed in the alluvial aquifer. Arcadis performed an independent evaluation of the USGS geophysical data. Because a workplan or written narrative was not released by the USGS regarding the objectives, assumptions, field procedures, data analysis, and interpretation of the geophysical data, Arcadis has made assumptions

pertaining to the geophysical data and interpretations of the data. Additional information on the collection, processing, and interpretation of this data is included in the Supplementary Information and Appendix A.

The USGS geophysical data were collected at the following monitoring wells: DD, DD2, MV, ND, Q, and T-11. Two forms of information were provided by the USGS: 1) PDF graphic plots of the data and 2) raw data in LAS format. LAS format is a logging industry standard data exchange format. LAS data were not provided for the follow types of logging data: 1) optical televiewer, 2) static spectral gamma, and 3) flow meter. The types of data collected include in each well except where noted:

Natural Radioactivity Log	Electromagnetic Logs	Hydrogeologic Logs	Well Construction Logs
Natural Gamma	Induction Conductivity	Ambient Flow Meter*	Hole Deviation (Tilt, Azimuth)
Dynamic Spectral Gamma	Induction Resistivity***	Pumped Flow Meter**	Caliper
Static Stacked Spectral Gamma		Fluid Temperature, Conductivity, Density, Salinity and Pressure	Casing Collar Locator (CCL)
			Optical Televiewer (OTV)

* Ambient flow was not collected in DD2 and MV

** Pumped flow was not collected in DD2, MV, and T-11

*** Resistivity is calculated from the conductivity values, which are the recorded logging parameter. Resistivity (ohm-m) = 1000/Conductivity (mmhos/m)

Geologic Interpretation of Natural Radioactivity and Induction Logs

Arcadis processed and portrayed the LAS data relevant to geologic conditions outside the well for the six wells that the USGS logged (DD, DD2, MV, ND, Q, and T-11). The results of the analysis are included in Attachment A. Arcadis analyzed the data using WellCAD Version 5.2 (Advanced Logic Technology). All USGS data were either directly included in the creation of the logs or were consulted for possible relevance, although not all are portrayed in the final output because Arcadis' primary objective was geologic interpretation.

Referring to the logs in Attachment A, the data are presented in traditional geophysical log format with depth in the vertical direction and plots of various parameters shown in groupings, or tracks. The Arcadis logs contain the following tracks, from left to right:

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Track	1	2	3	4	5
Content	Natural Gamma Ray Induction Conductivity	Dynamic Spectral Gamma: K, U, and Th in pCi/g. Static Spectral Gamma: K in %, U and Th in parts per million (ppm).	Depth in feet	Lithology	Well Construction
Data Used to Create Log	Natural Gamma Ray Induction Conductivity	Dynamic data plotted as provided by USGS. Static data converted to mass-based units.	Depth data gathered from each logging run	Natural Gamma, Induction Conductivity, Th/K Ratio, U concentration, Fluid Conductivity, Flowmeter Logs, Descriptive Logs	Optical Televiewer, Caliper, Fluid Temperature, Fluid Conductivity, Well construction documentation
Processing	Minimally processed data provided by USGS	K, U, and Th values recalculated to % or ppm; recalculated performed based on Stromswold 1994.	None	Th vs. K cross-plots to estimate mineralogy using Schlumberger plot. Experience based interpretations.	Compilation of historical data and in-well observations from geophysical logging
Comments	Primary logs used to interpret gross lithology outside the borehole – See Track 4	Uranium plotted as ppm, reflective of presumably U content in matrix primarily. Could provide insight into uranium concentrations in groundwater.	Common depth reference (ground surface) used for all logging probes, essential for properly aligning various data tracks.		Data mainly provided the condition of the interior of the wells, and historical data used for annular space.

Track 1 – Natural Gamma and Induction Resistivity Logs

Track 1 contains two types of logs: natural gamma ray (GAM[NAT] in American Petroleum Institute [API] units) and electrical conductivity calculated from the electromagnetic induction conductivity data in mmhos/meter.

The natural gamma log is a commonly used to interpret lithology in clastic sediments and rocks. It indicates the gross count of natural gamma rays emitted from radioisotopes in the formation, the most common of which is potassium-40 (^{40}K). Orthoclase, biotite, muscovite, glauconite, illite, smectite, montmorillonite, and mixed layer clays are common potassium minerals that contribute gamma rays. In mature sedimentary environments, coarse materials tend to be depleted of potassium minerals, and potassium clay minerals tend to dominate the natural gamma signal. In coarse sediments, natural gamma ray can also be created by uranium- and thorium-bearing heavy minerals.

The natural gamma, which ranges from 0 to 200 API units, is presented as a color-fill that ranges from red at the lowest gamma emission rate to dark blue at the highest emission rate. The spectrum of colors is intended to act as a visual guide with coarse to fine materials corresponding from red to blue. Specifically, the natural gamma data were compared to descriptive logs, and it was determined that 1) coarse clastics (sands and gravels) are indicated by red to yellow colors; 2) transitional mixtures (such as clayey sands and sandy clays) are generally in the light green to light blue range; and 3) clay and silt dominated fine-grained materials are in the light to navy blue range. The fine grain alluvial materials tend to have values similar to those of the Chinle Shale, while the coarse grain alluvium has values similar to those of the Chinle Aquifers.

The electrical conductivity log, shown as a black curve, provides additional insight regarding the lithology. Unlike natural gamma, the resistivity log is sensitive to water saturation and water chemistry (total dissolved solids). For example, in each well, the electrical conductivity shifts to a lower range of values at the water table. Therefore, it is difficult to make absolute statements about the resistivity values. In relative context, however, generally the more resistive materials tend to be “clean” mixtures of coarse materials. Well graded/poorly sorted coarse materials tend to be more resistive than well sorted coarse materials, which reflects the contrast in porosity (porosity being inversely proportional to resistivity). The relatively conductive materials tend to be mixtures of fine-grained materials. Note that clay minerals have a strong effect on conductivity, and a generalization can often be made that relatively high natural gamma corresponds to relatively high electrical conductivity. This relationship is useful in identifying materials where the source of natural gamma rays is other than ^{40}K; for example, the natural gamma log for well T-11 is strongly influenced by uranium content in the uranium-impacted sediments beneath the fill materials (roughly 75 to 120 feet), where conductivity and natural gamma are directly proportional.

Track 2 – Spectral Gamma Data

Track 2 contains parameters derived from the dynamic and static spectral gamma ray data. Dynamic spectral gamma ray data are collected as the logging tool is in motion in the borehole and is inherently noisy due to the random variability of radioactive decays. Static spectral gamma ray data are obtained by keeping the logging probe at a fixed location for a set amount of time, generally at least 15 to 20 minutes. In so doing, the population of individual instantaneously gathered data traces can be stacked together to create a more representative sample of the gamma ray spectrum. In its raw form, the spectral gamma ray data are an energy spectrum of gamma rays, spanning 0 to 3 million electron volts (Mev) of gamma

energy. Gamma ray energy is directly proportional to frequency and is related by Plank's Constant. In the typical naturally occurring radioisotope scenario, there is a dominant set of peaks as follows: a) Potassium-40: 1.46 Mev, b) Uranium-238: 1.76 Mev, c) Thorium-232: 2.62 Mev.

A modeling process is used to estimate the concentrations of each of the three elements based on the height of the peak at the given gamma ray energy levels in raw counts per second (cps). The modeled data provided by the USGS was reported in units of picoCuries per gram (pCi/g). For the static spectral data, Arcadis recalculated the values from activity-based units to mass-based units using the following equations from Appendix A of Stromswold (1994): a) 1% K = 8.371 pCi/g of K, b) 1 ppm U = 0.3337 pCi/g of U, c) 1 ppm Th = 0.110 pCi/g of Th.

These converted data are plotted on the logs in two types of plots: dynamic spectral gamma data for potassium, uranium, and thorium as a continuous plot in pCi/g and spectral gamma data as discrete bar plots in mass-based concentration units.

Track 3 – Depth

Track 3 is the depth track. In the case of the Grants site, the depth reference is ground level, and it is assumed that all geophysical logs are aligned with a common datum. An error was found in the USGS logs for Well T-11. The spectral gamma data are offset relative to the natural gamma data by 3.2 feet in depth, that is, the spectral gamma data are plotted 3.2 feet too deep on the USGS logs. It is possible to make this definitive conclusion due to the very high uranium concentrations in the upper portion of T-11 above 83 feet. It is not known with certainty if this same error exists for the other five wells. It has been assumed that the USGS made a systematic field error in misaligning the logging tool and the same correction was applied to the other five wells.

Track 4 – Lithologic Interpretation

Track 4 is a purely interpretive graphic log of the inferred lithologies based on the geophysical log data and the descriptive log data. Because the descriptive log data, which are typically a somewhat subjective document based in part on the observer's knowledge, are variable and more generalized, the geophysical log data received more weight by the Arcadis interpreter.

Track 5 – Well Construction

Track 5 is a well construction log derived from the geophysical data and historical documentation. Information regarding the well interior is of high confidence, but there is little or no information about the annular space provided by the geophysical logging.

Interpretation of Arcadis' Plots of USGS Data

In comparing the uranium concentrations in the six wells geophysically logged by the USGS, it appears that the uranium is closely tied to finer grained materials. As a generalization, the central portion of the valley has more coarse-grained materials. Coarse-grained materials tend to display a lower uranium content (for example, see the geophysical log for well MV from 62 to 104 feet in depth) where the association between grain size and uranium content is discernible. In contrast, the wells at the flanks of the valley have more fine-grained materials, and the association between spikes of uranium and fine-grained materials, and their abundance, is in sharp contrast with well MV.

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Observe that, in wells DD2 and DD, there are several uranium "spikes" within the screened interval. It could be inferred that the localized concentration of uranium in the soil matrix in the vicinity of the wells may provide a range and variability in uranium concentration in groundwater which, although still considered to be background, may be statistically distinct from valley-centered wells with low uranium concentration within screen intervals.

The thorium/potassium ratio is used to estimate the relatively maturity of sediments. A low ratio near 1 can indicate that the source of radioactive potassium is primarily found in feldspars and micas.

Geophysics at Boreholes DD-BK and DD2-BK

The geophysical logs provided in Attachment B provide a side-by-side comparison of geophysical, visual descriptive, and chemical responses of the alluvium and bedrock. The chart shown below is a summary of the information obtained and describes the "log tracks" shown on Figure 17. Figure 17 is a condensed representation of the geophysics dataset depicted in Attachment B.

The natural gamma ray, induction conductivity, and visual descriptions confirm that the fine-grained materials (silts and clays) exhibit the most elevated natural gamma and electrical conductivity responses. The electrical conductivity has a positive baseline shift to the right below the water table at approximately 45 feet deep (as expected due to the presence of water); otherwise, the electrical conductivity data track the natural gamma strongly. This relationship confirms that elevated natural gamma is due to clays rather than sandy materials containing potassium-bearing minerals such as orthoclase or muscovite.

With respect to the static spectral gamma uranium results, there is an overall strong correlation between fine-grained facies and total uranium content. Qualitatively, there appears to be roughly a two- to three-fold contrast between uranium concentration in finer facies versus coarser facies, both saturated and unsaturated.

Uranium is present at higher concentrations in fine-grained sediments, rather than in the coarse-grained sediments, where groundwater is predominantly moving. Uranium at higher concentrations in groundwater at DD and DD2 is therefore due to local sources from fine-grained sediments deposited over geologic time (at least hundreds of years for shallow alluvial deposits [Leopold and Snyder 1951] and probably thousands for deeper alluvial deposits), rather than to migration of groundwater from upgradient locations.

Log Track	1	2	3	4	5
Content	Natural Gamma Ray & Induction Conductivity	Visual Description & Sample Photos	Dynamic and Static Spectral Gamma	Laboratory Total Uranium & Leachable Uranium	Laboratory Total Iron and Potassium
Information Provided and Relevance	Natural Gamma Ray corresponds primarily to potassium content. Immature sediments and clays are the most common gamma ray emitters. Helps to identify subtle patterns of coarsening or fining sequences. Induction conductivity supplements natural gamma ray logging. Clays tend to be the most electrically conductive in fresh water environments; coarse materials, such as sand, tend to be the least conductive.	Continuous sampling via rotosonic drilling provided the geologist with an uninterrupted alluvial sequence. The geophysicist and geologist worked together to select soil samples for laboratory analysis. Photos of the samples provide visual confirmation of the geophysical and descriptive results.	The uranium peak of the spectral gamma datasets was modeled using stripping and calibrated to provide uranium concentration in ppm total uranium. The dynamic data provide a continuous indication of gross uranium variation. The static results provide a higher confidence estimate of uranium concentration of the bulk alluvium. Provides insight into which facies may be contributing uranium to groundwater.	Samples collected using visual, field radioactivity, and geophysical guidance were delivered under proper chain-of-custody procedures to ELI for total and leachable uranium testing as discussed above. Co-plotting with the geophysical data provides a means to visually correlate lab and field results more effectively.	Because natural gamma responds primarily to potassium-bearing minerals, inclusion of total potassium provides the means to cross-check the soil textures with the chemistry. Iron minerals are known to impact induction conductivity readings due to magnetic susceptibility of some mineral phases such as magnetite.

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Another aspect of the geophysical interpretations is the relevance to the degree of variability in facies from location to location where wells are screened. Figure 17 is a side-by-side comparison of the natural gamma, spectral gamma, and laboratory total uranium results. By correlating the two nearby locations, several stratigraphic patterns are apparent, allowing designation of four alluvium units above the Chinle Formation, as follows, from the surface downward:

- Unit 1 (~10 to 12 feet thick): interbedded silty sand and clay. Natural gamma character very similar between both locations. The base of the lower clay was sampled in DD2-BK at 11 to 12 feet and exhibited the highest total uranium concentration of any sample (10 mg/kg). Spectral gamma results were between 1 and 3 ppm uranium. The discrepancies between the analytical chemistry results and the spectral gamma could be due to heterogeneity in the samples or to the inability of USEPA method 3050B (total soils digestion) to dissolve all mineral content. This digestion method uses nitric and hydrochloric acids to evaluate the environmentally accessible uranium; however, there can still be a significant fraction of the uranium tied up in silicate minerals that do not dissolve in this acid. For example, coffinite, a uranium silicate, may not be readily leached without the use of hydrofluoric acid, a more aggressive digestion method.
- Unit 2 (~20 feet thick): relatively uniform coarse-grained material, mostly sand. Total uranium was non-detect in this unit (<1 mg/kg). Spectral gamma varied from 0.3 to 3 ppm uranium.
- Unit 3 (~12 to 14 feet thick): interbedded silty sand and sand with one clay bed. Laboratory total uranium concentrations were 1 mg/kg or less. Spectral gamma varied from 1 to 5 ppm with an apparent inverse correlation between grain size and uranium content.
- Unit 4 (~27 to 32 feet thick): complex mixture of coarse and fine materials including a number of clay beds that are poorly correlated between DD-BK and DD2-BK. Unit 4 is thicker in DD2-BK than in DD-BK, and it exhibits more fine-grained materials. Near the base of DD2-BK, two samples contained 2 mg/kg uranium, and one sample contained 5 mg/kg uranium. Spectral gamma varied from 0 to 4 ppm uranium.

The portion of the Chinle Formation penetrated in the drilling work consisted of predominantly shale with some sandstone in DD-BK from 72 to 78 feet. Spectral gamma results from the Chinle Formation varied from 4 to 6 ppm in the shale and 1 ppm in the sandstone.

This work corroborates the soil chemistry and mineralogy results discussed below, showing higher uranium in fine-grained materials than in coarse-grained materials and the presence of uranium both in the unsaturated and saturated zones.

Soil Geochemistry, Mineralogy, and Construction of Cross-Sections

Drilling and Lithological Assessments

The lithological logs for DD-BK and DD2-BK indicate a higher degree of lithological heterogeneity than previous drilling logs from adjacent groundwater wells DD and DD2 (Appendix B). The difference can be attributed to the drilling methodologies used, where previous well installations were typically conducted using a mud rotary drilling rig, with the sediment and rock chips logged from mud returns. This

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investigation was conducted using a sonic drilling rig with the return of intact sediment and rock core through the entire length of the borehole that was not affected by drilling fluid.

The return of intact core has made it possible to perform detailed lithological logging of the alluvial sequence, with the subsequent construction of the cross-section of the DD/DD2 area reflecting this level of detail (Figure 18). The detailed cross-section has been extended to include the driller's log from well Q, located northeast approximately 3000 feet away, to highlight the difference in the lithological resolution. The fine variability in vertical and lateral distribution of clays, silts, sands, and gravels was critical in the interpretation and understanding of the lithological uranium associations and distribution. Several sedimentary layers were able to be linked between boreholes DD-BK and DD2-BK, particularly when also incorporating the geophysical interpretations. This level of detail is key to understanding the geology, hydrogeology, and geochemistry of the basin and was not possible using the previous drilling logs from groundwater monitoring wells DD, DD2, or Q.

Groundwater was encountered at around 45 ft bgs at DD-BK and 42 ft bgs at DD2-BK. The shallowest point at which groundwater has ever been measured at wells DD and DD2 were 42 and 42.2 feet below measuring point, respectively, on May 30, 2017 and December 29, 2014, respectively. Thus, samples collected shallower than 42 feet at DD-BK and DD2-BK are considered to be in the unsaturated zone and have not been exposed to groundwater since well DD's installation in 1976 or well DD2's installation in 2008. Samples collected deeper than 42 feet bgs are considered to be in the saturated zone and are exposed or have been exposed to groundwater contact.

Geochemical Assessment

The highest uranium concentrations (1 to 10 mg/kg) generally occurred in fine-grained materials including clay, silt, and silty fine sands (Table 7). In one case, a high uranium concentration (5 mg/kg) occurred in a gravely sand with silt. High uranium was generally correlated with high aluminum, iron, phosphorus, potassium, sodium, and vanadium (Figures 19 and 20). Total molybdenum and selenium were not detected in most samples (method detection limit of 1 mg/kg), though in most cases, they did produce measurable leached concentrations, indicating that molybdenum and selenium were still present.

At borehole DD-BK, all three samples that exhibited detectable uranium were clays, and two of these three uranium-bearing samples occurred above groundwater in the unsaturated zone (Figure 19). The remaining seven samples that exhibited non-detect uranium were coarser-grained materials that ranged from fine to coarse sand to silty sand and gravel. At borehole DD2-BK, eight of the nine samples exhibited detectable uranium (Table 7). The compositions of these samples ranged from clay to gravely sand with silt. The highest total uranium (10 mg/kg) and leachable uranium (0.179 mg/L), under laboratory method conditions, occurred in a clay in the unsaturated zone at 11 to 12 feet depth.

Uranium is known to be present in clays associated with ore in the Grants Mineral Belt. Uranium is found there in chlorite, illite, and mixed-layer illite-montmorillonite, as well as kaolinite (Brookins 1982). Smectite (montmorillonite), illite, and kaolinite were all identified as the major clay minerals in the oriented clay mount (<2 μm) prepared for x-ray diffraction (DD2-BK-11-12 and DD2-BK-60-61; see below). Brookins describes the reduction of vanadium to V^{4+} or V^{3+} and incorporation into clay minerals, along with uranium, at a redox front in conjunction with organic carbon and pyrite. The correlation of uranium with vanadium in clays and silts from DD-BK and DD2-BK is consistent with studies of tabular uranium-vanadium bodies in sandstone beds of the Morrison Formation, and the occurrence of vanadium clays

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and association with detrital organic material (Blake et al. 2017; McLemore 2010). The close association of uranium with vanadium indicates that the presence of uranium is due to mineralogical association rather than sorption of uranium in groundwater to mineral phases.

Leachability was tested using an alkaline solution similar in alkalinity to that found in the alluvial aquifer in the Grants Reclamation Project area. At borehole DD-BK, molybdenum, selenium, uranium, and vanadium exhibited the greatest leachability between 36 to 39 ft bgs and at depths greater than 58 ft bgs in silty fine sands (Figure 19). Leached molybdenum, selenium, and uranium are roughly inversely proportional to the bulk of the total metals concentrations for aluminum, iron, phosphorus, potassium, and sodium at each depth; where high bulk metals are recorded, low to moderate leaching of molybdenum, selenium, and uranium is apparent. Leached vanadium behaves roughly inversely proportionally to its total metals concentration. At borehole DD-BK, uranium, vanadium, and molybdenum leaching were all correlated, providing further evidence of the co-occurrence of these elements in discrete mineral phases that were mobilized by the alkaline leach solution. Vanadium and molybdenum were not detected in groundwater at well DD.

At borehole DD2-BK, selenium and vanadium exhibited greater leachability with depth, while molybdenum exhibited greatest leachability in the shallow samples (<36 ft bgs; Figure 20). Uranium was most leachable in the shallowest and deepest samples (<36 ft bgs: silty sand and clay and >67 ft bgs: silty fine sands). Uranium displays a proportional relationship between the leached concentration and the total uranium concentration. Vanadium displays an inverse leaching relationship with its total metals concentration. In samples with high total vanadium, leached vanadium is low and vice versa.

In general, it is expected that leached metals results will be proportional to total metals results, though leachate characteristics, geochemical speciation, and mineralogical differences can dictate leaching behavior, with the specific mineral form of the trace element controlling its leachability. Variability in trace metal content with depth in the soil column, correlation between trace and major elements, and the variability in leaching behavior indicate that the trace elements reside predominantly within soil minerals rather than solely being present as dissolved species in residual groundwater within the soil samples.

Mineralogical Assessment

X-Ray Diffraction

XRD was completed on six samples, with two samples receiving both bulk mineralogy XRD and clay-specific XRD. The analytical report for this work is provided in Appendix B. Table 8 shows the tabulated XRD results, plus lithologic data and uranium content data for each sample. Samples submitted for XRD included three clays and three sands, the latter ranging from silty sand to gravely sand. The majority of the non-clay material was quartz, potassium feldspar, and plagioclase, representing weathering products from granites, sandstones, and occasional indications of basalt and other igneous rock types. The clays consisted of smectite, illite, and kaolin, with swelling smectite being the dominant component. Occasionally, calcite, gypsum, and hematite were detected. Visual observation by the laboratory suggested that up to 3% of the material was iron oxide due to the red color of the samples; this was not seen in the XRD spectra; therefore, the iron oxide is assumed to be amorphous in nature.

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Microscopy and Energy Dispersive X-Ray Spectroscopy

Key takeaway: Geochemically reduced (sulfides) and oxidized (sulfate/iron hydroxides) minerals are abundant, indicating heterogeneity in the mineralogical environment, microenvironments, and transitions from reducing to oxidizing conditions, affecting uranium mobility.

The samples submitted to DCM for microscopic and spectroscopic analysis can be discussed in two major classes: clays and clastic materials. The most common feature among all of the samples is that almost all contain fine-grained materials such as clays and silts, all contain iron oxides, and all contain a mixture of oxidized and reduced minerals (e.g., sulfates/oxides and sulfides). This indicates that the redox conditions to which the alluvial materials are exposed have changed over time, and demonstrates the heterogeneous nature of the alluvial sediments, both in the saturated and unsaturated zones. This could partially be due to the creation of microenvironments, especially in samples with significant clay content, which can inhibit free water and air movement through the alluvium. Microenvironments can allow the formation of reduced minerals and preservation of these minerals in an isolated area within an oxidizing aquifer.

For example, the majority of the samples contain metal sulfides, particularly notably as pyrite framboids. Pyrite framboids are most often formed by sulfate-reducing microbes (SRB) through the reduction of sulfate to sulfide (Qafoku et al. 2009). The framboids are made up of cubic and octahedral pyrite crystals that are roughly uniform in size and aggregate in a spherical structure. Over time in an oxidizing environment, the pyrite can transform into iron oxides. This occurrence is clearly seen in a SEM micrograph from sample DD2-BK-51-52-012318 (borehole DD2-BK at a depth of 50 to 51 ft bgs; Figure 21), where most pyrite crystals in two framboids has been converted to iron oxides; but select pockets of iron sulfide remain in the center of one of the framboids, where oxidizing agents presumably have not yet penetrated.

This process is important for a number of reasons: 1) the formation of pyrite by SRB fractionates sulfur because the SRB preferentially use the lighter sulfur isotope (Krouse and Grinenko 1991); 2) oxidation of pyrite originally formed by SRB dissolves the pyrite and releases isotopically light sulfate into groundwater (supported by the light sulfate measured in groundwater throughout the San Mateo Creek Basin); 3) pyrite is known to be a scavenger of uranium (Qafoku et al. 2009), and the oxidation of pyrite as seen here could release entrained uranium to groundwater; and 4) the presence of pyrite signals that, at one time, the alluvial materials (whether saturated or unsaturated) were at least partially reducing. The last point is significant because uranium itself is redox sensitive and becomes less soluble in its reduced form (Descostes et al. 2010). The transition of the alluvial system or microenvironments within the alluvial system from reducing to oxidizing has the potential to release uranium through dissolution of pyrite, but also through oxidation of uranium from uranium (IV) to uranium (VI). Uranium (VI) is highly mobile, especially in water with high alkalinity, due to the formation of highly soluble uranium carbonate species, such as those encountered at the site and the surrounding San Mateo Creek Basin. The presence of these sulfide minerals and their transformation (oxidation) products in the aquifer system near DD and DD2 provide evidence of a mechanism for sourcing uranium to groundwater from naturally occurring minerals.

Key takeaway: Clays are mineralogically complex, contain abundant organic carbon, and may serve as a reservoir for reduced uranium, with diffusion of water and oxygen into clay porewater resulting in leaching of uranium to groundwater.

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The clays can be characterized as iron oxide-stained clays with abundant organic inclusions and disseminated metal sulfides including pyrite (iron), chalcopyrite (copper), galena (lead), sphalerite (zinc), and assorted other minor metal sulfides. The clays also contain sporadic sulfate minerals (such as barite and gypsum) and oxides (such as iron oxides and copper oxides). The combination of reduced minerals and oxidized minerals suggests the heterogenous nature of each of the samples and the presence of microenvironments within each sample (as discussed above). Another example of this is the presence of secondarily precipitated minerals (such as euhedral gypsum, barite infilling fractures, and vugs containing clusters of the highly soluble mineral halite [sodium chloride]) in sample DD2-BK-60-61-012618 (borehole DD2 at a depth of 60 to 61 ft bgs; Figure 22).

Calcite is also present and is intermixed with the clays. Calcite can act as a source of locally available alkalinity that can encourage leaching through the formation of uranium-carbonate species. Of the characteristics held common among the clay samples, the two most notable are the presence of high amounts of organic carbon and iron oxides. Uranium is often associated with organic carbon because organic carbon is a strong reductant and can reduce, immobilize, and concentrate uranium (Spirakis 1996). While uranium was not detectable in the samples due to detection limits of the EDS (approximately 0.1 wt. %), the presence of organic carbon can serve as a persistent source of reducing power in the alluvial system, providing means for uranium to remain immobilized in areas with high organic carbon. In addition to organic carbon, iron oxides can also accumulate uranium. While iron oxides are pervasive throughout the clays and in the iron oxide pseudomorphs of pyrite, very little to no iron oxides were detected through XRD. This indicates that the iron oxides are primarily amorphous, which can occur during transformation from iron sulfide to iron oxide or when ultrafine-grained iron oxides precipitate from a solution and have not had sufficient time to "ripen" or crystallize (Zhu et al. 2016).

Key takeaway: Minerals present in the Morrison Formation (the primary uranium host in the basin) are evident in the alluvial soils near DD and DD2, and morphologies observed indicate water-borne transport and deposition large distances from their origin.

The clastic materials range from silty sands to gravely sands and are characterized by angular to rounded quartz silts and sands, angular to sub-rounded feldspars and plagioclase, amorphous iron oxides (especially as pseudomorphs of pyrite framboids; Figures 21 and 23), and clay coatings on sand grains. The rounded and sub-rounded nature of the clastic grains indicates that they have been transported a significant distance from their source. The mix of angular clastic materials in the alluvial materials reflects either a more proximal source or that larger lithic fragments were transported and broken into smaller fragments closer to the location of their final deposition. This is the most likely case for two reasons: 1) larger lithic fragments are visible in the samples (Figure 24) as clusters of quartz and feldspar as granite and volcanic glass (DD2-BK-25-26-012218), as portions of basalt featuring euhedral crystals of labradorite plagioclase (DD2-BK-71-72-012318), and as rock fragments up to three centimeters (cm) in size consisting of indurated fine-grained arkosic sandstone cemented by a combination of iron oxide, carbonate, and clay (also DD2-BK-71-72-012318); 2) the high topographic units that weathered to contribute to the alluvial materials are roughly the same distance away from boreholes DD-BK and DD2-BK, and are located at the boundary of the San Mateo Creek Basin. The two high-uranium units of the Morrison Formation are the Westwater Canyon member and the Brushy Basin member, both of which are known to contain claystone, kaolin, and unaltered angular grains of feldspar (Freeman and Hilpert 1956) such as that seen in DD2-BK-25-26-012218. Both the Westwater Canyon member and a third unit, the

Recapture member, contain medium- to coarse-grained arkosic sandstones (Santos 1970), such as those lithic fragments seen in DD2-BK-71-72-012318.

Key takeaway: Uranium was not directly observed; however, this is likely due to its presence either as a very finely disseminated constituent that is below the detection limit of the EDS or a highly heterogeneously distributed constituent (e.g., one grain of pitchblende or uraninite amongst thousands of grains of sand). Its origin within the alluvial aquifer soil and natural weathering and release mechanisms as supported by the various "parent" minerals that were observed and their transformation products.

Uranium is known to associate with organic matter (Spirakis 1996), pyrite (Descostes et al. 2010), iron oxides (Sato et al. 1997), clays (Campos et al. 2013), and zircons (Nasdala et al. 2010). Although uranium is detected in the bulk total metal chemistry of the stratigraphic horizons at concentrations up to 10 mg/kg, uranium and uranium minerals were not detected in the samples through EDS or optical mineralogy. This could be due to two factors: either the uranium is highly segregated into discrete mineral phases (such as pitchblende) and the probability of encountering one of these mineral fragments among the thousands of other mineral grains in the samples is very low, or the uranium is so finely disseminated throughout the sample that it occurs in concentrations below the detection limit of the EDS (i.e., it is present at a concentration less than 1,000 ppm [0.1 wt. % or 1,000 mg/kg] in any one area). Both possibilities are possible. Upon integration of the geochemical analytical work and the microscopy and spectroscopy work, a direct correlation between the moisture content and uranium and vanadium is apparent (Figure S17). The samples with the highest percent moisture are the clays, which tend to absorb and trap water in their sheet-like structures. Similarly, the samples with the highest uranium and vanadium content are mostly clays, suggesting that the uranium and vanadium might be originating from the immobile porewaters of the clays.

Vanadium was detected in the EDS analysis; soil from DD2-BK (60 to 61 ft bgs), showed a clay mass with vanadium as well as rare-earth elements (REEs; Figure 25). Vanadium is typically less soluble than uranium; it does not form soluble complexes with carbonate, and it predominantly exists in solution as the vanadate (V^{5+}) oxyanion ($H_2VO_4^-$) with a greater likelihood to sorb to iron minerals than uranium (Wright et al. 2014). While uranium may oxidize and dissolve in pore water, vanadium may be more stable and preserved at higher concentrations in the soils.

This work provides a technical basis for the occurrence of uranium in groundwater at the western edge of the alluvial basin at DD and DD2 at concentrations higher than observed near the center of the alluvial channel. In summary, the following conclusions were reached:

- Sediment cores lithologically logged from boreholes DD-BK and DD2-BK indicated that the alluvial sequence is an alternating sequence of clays, silts, silty-sands, sandy-silts, sands with various amounts of gravel, and occasional gravel. Previous drilling logs suggested that the alluvium was uniform with depth with very low variability in lithology. The sequence is much more heterogeneous than previous drilling logs have interpreted.
- Discrete depth intervals with elevated radioactivity counts were indicated in alluvial sediments from both the saturated and unsaturated zones, from various lithological types of materials. This indicates the presence of sedimentary materials in the alluvium that contain radioactive constituents deposited differentially as part of the natural depositional sequence.

- Geophysical logging indicates that the alluvium, particularly the lower two units identified in this work, are laterally highly variable even over short distances. The fine-grained materials were found to correlate with elevated uranium from spectral gamma analysis, most closely in the lower two units.
- Geochemical analyses indicate that, in general, uranium and vanadium co-occur at higher concentrations (e.g., in soil recovered from DD, vanadium was detected at elevated concentrations when uranium was detectable). These elements are also correlated with increasing moisture content due to leaching from solid alluvial materials to water.
- The highest uranium was encountered in the unsaturated zone, indicating that uranium in alluvial deposits is naturally occurring due to transport and deposition of naturally uranium-rich materials over hundreds to thousands of years, not from deposition from uranium-bearing groundwater.
- Mineralogical analyses suggest that the materials encountered at boreholes DD-BK and DD2-BK are associated with source rock that contains unaltered feldspars, claystones that include kaolin, and arkosic sandstones also found at the upgradient northern boundary of the basin in the Westwater Canyon and Brushy Basin members of the Morrison Formation.
- Framboidal pyrite that has been converted to iron oxides indicate that a redox change has occurred. What was once reduced, supporting the formation and presence of pyrite, is now oxidized. The presence of sulfate minerals in DD-BK and DD2-BK, including large crystals of gypsum and microscopic but pervasive barite, also supports this transition to an oxidized system. Such a change can result in the release of uranium due to oxidation of low-solubility uranium (IV) to high-solubility/high-mobility uranium (VI). This mechanism is a likely source of leaching of uranium from solid alluvial materials to groundwater.

VII. CONCEPTUAL SITE MODEL

A CSM has been developed that defines the erosion and subsequent deposition of uranium-rich deposits from geological formations upgradient of the Grants Reclamation Project as part of the formation of the alluvial system via natural processes. These materials were deposited in discrete lithological horizons that exist in both the saturated and unsaturated zones. The uranium-rich lithologies present in the saturated zone have the potential to cause naturally increased localized uranium concentrations. The uranium-rich lithologies present in the unsaturated zone, at depths of 11 to 36 feet, indicate that the uranium in alluvial sediments was emplaced not through precipitation from groundwater, but through natural erosion and deposition of uranium-bearing minerals from bedrock sources lining the basin over hundreds to thousands of years. The CSM is presented on Figure 26 and has the following stages:

- Weathering and erosion of exposed uranium-bearing formations (Morrison Formation [Jurassic], Dakota Sandstone [Cretaceous], and other associated uranium rich formations to the north of the site) occurred over hundreds to thousands of years with eroded sediments containing high or low uranium concentrations depending on the source. The highest concentrations of uranium-bearing sediments may have been derived from the northwest based on the density of natural uranium deposits in that area.
- Alluvial material was transported and deposited over hundreds to thousands of years along the alluvial valley by a braided stream channel with varying depositional velocities, resulting in the formation of alternating clay, silt, sand and gravel layers.
- The concentration of uranium in the deposited sediments depended on the erosional and depositional environment, with the presence of finer-gained sediments (and associated uranium-vanadium bearing clays, sulfide minerals, humate-organic particles, and uraninite/coffinite minerals) frequently associated with higher uranium concentrations.
- Regional groundwater recharge varied across the basin, with groundwater along the east being derived from lower-solute, low-uranium snowmelt from Mount Taylor.
- Localized dissolved-phase uranium has leached from silt and clay-rich sediment layers within the alluvial sequence in response to natural groundwater geochemistry (elevated alkalinity and TDS), resulting in groundwater containing variable and natural uranium concentrations with depth and spatially across the alluvial channel.

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VIII. CONCLUSIONS

This paper provided a summary of an evaluation initiated in 2016 to determine the source of uranium to alluvial groundwater at locations upgradient of the Grants Reclamation Project, specifically at monitoring well locations sampled for the purpose of establishing the background concentration of uranium and other constituents in groundwater. The data from these locations were used to set the Site Background Standards for the site, and ultimately the restoration goals for the various aquifers affected by operation of the Grants Reclamation Project. The tasks associated with this evaluation included collection of groundwater samples from the multiple aquifers at the site, as well as the LTP, using a range of sampling methods with analysis for an extensive set of parameters not typically evaluated as part of routine groundwater monitoring. The USEPA, with support from USGS, led this effort and it was duplicated using split samples collected by HMC/Arcadis. Geophysical tools were used to evaluate six of the 22 wells sampled and proved useful for the development of a detailed lithological log of the alluvial aquifer. HMC/Arcadis followed up this work in 2018 with additional borehole installation, lithological logging, soil chemistry and mineralogy, and geophysical analysis. The results of all of this work were used to develop a CSM for the source of uranium to groundwater at the background monitoring wells. The conclusions of this work are summarized here.

Established Background for Uranium

The dataset evaluated over the period 1995 through 2004 for the nine wells in the alluvial aquifer (124 individual data points) to establish the Site Background Standards was determined to be appropriate for its specified purpose. Groundwater moving in from upgradient that contains elevated concentrations of COCs did not affect the uranium concentrations during this period, nor did mill site groundwater restoration. The emplaced hydraulic barrier caused some water level elevation increase north of LTP due to hydraulic damming; however, this did not affect calculation of background standards nor did it change the natural north to south flow of groundwater down the San Mateo Creek Basin. The nine wells capture the range of heterogeneity in constituent concentrations across the alluvial channel upgradient of the Grants Reclamation Project. Well DD, with the highest uranium concentration measured among the nine wells, is located in an area of the channel with elevated uranium concentrations due to lithology/mineralogy and local, natural uranium sources to groundwater.

The site standards, set during the period during which groundwater moving in from upgradient that contains elevated concentrations of COCs were not present, will likely need to be adjusted in order to ensure that the Grants Reclamation Project is only responsible for remediating groundwater contamination resulting from site activities.

Uranium Sources to Groundwater

The source of uranium to the background well locations was shown to be associated with uranium-bearing sediment in alluvial aquifer soil. Sediment cores lithologically logged from boreholes DD-BK and DD2-BK indicated that the alluvial sequence is an alternating sequence of clays, silts, silty-sands, sandy-silts, and sands with various amounts of gravel. The sequence is more heterogeneous than previous drilling logs have interpreted. The great variability in uranium concentrations at upgradient monitoring well locations is attributed to the variability in lithology/soil grain size/mineralogy and water chemistry across

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the alluvial channel. Wells DD and DD2 on the west side of the channel show higher uranium concentrations in groundwater due to this variability in lithology and naturally occurring sources of uranium associated with finer-grained sediments located in this area of the alluvial channel. In addition, the Grants Reclamation Project activities are not the source of uranium to these locations, as shown by significant differences in major and minor (trace) element composition between LTP tailing porewater and upgradient locations.

Mineralogy of Uranium in the Alluvial Aquifer Sediments

Mineralogical analyses suggest that the materials encountered at boreholes DD-BK and DD2-BK are associated with source rock that contains unaltered feldspars, claystones that include kaolin, and arkosic sandstones such as the Westwater Canyon and Brushy Basin members of the Morrison Formation. Geochemical analyses indicate that uranium and vanadium are generally found to co-occur and with increasing moisture content due to leaching from solid alluvial materials to water. Framboidal pyrite that has been converted to iron oxides indicate that a redox change has occurred since deposition of the alluvial material. What was once reduced, supporting the formation and presence of pyrite, is now oxidized. Such a change can result in the release of uranium due to oxidation of low-solubility uranium (IV) to high-solubility/high-mobility uranium (VI). This mechanism is a likely source of leaching of uranium from solid alluvial materials to groundwater.

Sampling Methods Deployed during the 2016 Split Sampling Event

Split sampling results were generally comparable between the HMC-collected samples and the USGS-collected samples, with the exception of the PDSs, which cannot be compared because the USGS data have not been released. The PDSs deployed during the USGS 2016 SSE did not collect accurate data from the alluvial aquifer system and cannot be depended on to represent background concentrations of any constituent. Changing the PDS design from a 30 mL bottle that has a high screen surface area-to-volume ratio to a 250 mL bottle that has a much lower screen surface area-to-volume ratio likely decreased the equilibration potential of the bottles and increased the time required for full equilibration of constituents. The potential of the constituents to bind to the nylon mesh indicates that concentration artifacts could be caused by the samplers themselves, further skewing the data produced by these samplers. PDSs such as the ones used here should not be used to measure concentrations of redox-sensitive constituents, such as selenium and uranium, as artifacts due to the oxygenation of the well and other microenvironment effects can alter their concentrations. These factors, among others, lead to different equilibration rates among constituents, and these constituent-specific rates must be taken into account when normalizing PDS concentrations to source waters.

Geophysical Methods and Interpretation of Alluvial Geology and Mineralogy

The geophysics data from the 2016 SSE, as reported by USGS, were offset by 3 feet in key wells and were corrected to ensure proper data interpretation. Despite this finding, geophysical methods were useful in providing further insight into the complexity of the lithology/stratigraphy of the alluvial aquifer – something that was previously unknown relative to the aquifer upgradient of the Grants Reclamation Project. In comparing the uranium concentrations in the six wells geophysically logged by the USGS, it

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appears that the uranium was closely tied to finer-grained materials, consistent with information provided by the soil chemistry work on boreholes DD-BK and DD2-BK. As a generalization, the central portion of the valley has more coarse-grained materials, which tend to display a lower uranium content. In contrast, the wells on the western side of the valley (such as DD and DD2) have more fine-grained materials, and the association between spikes of uranium and fine-grained materials and their abundance is in sharp contrast to wells in the center of the valley.

Geophysical evaluation of the wells with the highest uranium concentration in groundwater (DD and DD2) reported several uranium "spikes" within the screened interval. This indicates that the localized concentration of uranium in the soil matrix in the vicinity of the wells may provide a range and variability in uranium concentration in groundwater which, although still considered to be background, may be statistically distinct from valley-centered wells with low uranium concentration within screen intervals.

In addition, geophysical assessment identified discrete depth intervals with elevated radioactivity counts in alluvial sediments from both the saturated and unsaturated zones, from various lithological types of materials. This indicates the presence of sedimentary materials in the alluvium that contain radioactive constituents deposited differentially as part of the natural depositional sequence.

This work shows that uranium is present at higher concentrations in fine-grained sediments, rather than in the coarse-grained sediments where groundwater is predominantly moving. Uranium at higher concentrations in groundwater at DD and DD2 is therefore due to local sources from fine-grained sediments deposited over hundreds to thousands of years, rather than to migration of groundwater from upgradient locations. The geophysical work corroborates the soil chemistry and mineralogy results presented in this paper, showing higher uranium in fine-grained materials than in coarse-grained materials, that uranium is present both in the unsaturated and saturated zones, and that the highest uranium encountered was in the unsaturated zone.

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TABLES

Table 1
Ground Water Protection Standards
Grants Reclamation Project

Constituents	Alluvial	Chinle Mixing Zone	Upper Chinle Non-Mixing Zone	Middle Chinle Non-Mixing Zone	Lower Chinle Non-Mixing Zone
Selenium (mg/L)	0.32	0.14	0.06	0.07	0.32
Uranium (mg/L)	0.16	0.18	0.09	0.07	0.03[1]
Molybdenum (mg/L)	0.1[1]	0.1	0.1[1,3]	0.1[1,3]	0.1[1,3]
Sulfate (mg/L)	1500	1750	914	857	2000
Chloride (mg/L)	250[1]	250[1]	412	250[1]	634
TDS (mg/L)	2734	3140	2010	1560	4140
Nitrate (mg/L)	12	15	*	*	*
Vanadium (mg/L)	0.02[1]	0.01[2]	0.01[2]	*	*
Thorium-230 (pCi/L)	0.3	*	*	*	*
Ra-226 + Ra-228 (pCi/L)	5	*	*	*	*

Notes:

Shaded values are Site Background Standards that are statistically-based.

[1] GWPS based on non-statistical value. Refer to Homestake Mining Company of California. 2005. Correspondence from Alan D. Cox (HMC) to Jerry Schoeppner (NMED), Re: Grants reclamation project Homestake response to NMED 1/20105 comments on proposed around water background concentrations for HMC Grants Millsite June 9, 2005. [Adams Accession No. ML060790062]

[2] GWPS based on non-statistical value. Refer to Environmental Restoration Group. 2003. Statistical evaluation of Chinle aquifer quality at the Homestake site near Grants, NM. Prepared for Homestake Mining Company of California. October 2003.

[3] GWPS based on non-statistical value. Refer to Homestake Mining Company of California. 2006. Correspondence from Alan D. Cox (HMC) to Paul Michalak, (U.S. Nuclear Regulatory Commission), Re: Grants Millsite Reclamation Project - SUA-1 471 - Docket No. 40-8903 Tracking number - TAC LU0014 Aquifer Site Standards. January 19, 2006. [Adams Accession No. ML060250273]

* Site standards were not proposed for the constituents in the indicated aquifer.

Table 2
Well and Borehole Construction Table
Grants Reclamation Project

Location ID	Well or Borehole	Latitude	Longitude	Well Screen Interval (ft bgs)	Total Depth (ft bgs)	Casing Stickup Height (ft)	Well Inner Diameter (inches)	Aquifer/Location	Well/Borehole Use/Fate	Geophysics	Passive Sampling	Volumetric Purge Groundwater Sampling
920	Well	35° 16' 34.374" N	107° 50' 37.390" W	--	--	0.7	7	Far Upgradient Alluvium	Domestic	No	No	Yes
P3	Well	35° 14' 58.595" N	107° 51' 51.106" W	55-95	95.0	2.2	5	Near Upgradient Alluvium	Collection	No	No	Yes
DD	Well	35° 15' 7.202" N	107° 52' 13.316" W	42-80	80.0	1.9	4	Near Upgradient Alluvium	Monitoring	Yes	Yes	Yes
DD2	Well	35° 15' 12.160" N	107° 52' 7.574" W	54-90	92.5	2.0	5	Near Upgradient Alluvium	Monitoring	Yes	Yes	Yes
ND	Well	35° 14' 56.716" N	107° 51' 1.826" W	41.5-61.5	68.7	1.1	4	Near Upgradient Alluvium	Monitoring	Yes	Yes	Yes
Q	Well	35° 15' 24.069" N	107° 51' 34.628" W	67.5-100.5	100.5	2.3	4	Near Upgradient Alluvium	Monitoring	Yes	Yes	Yes
ST	Well	35° 14' 28.669" N	107° 52' 16.375" W	55-97	97.0	2.2	5	Alluvium	Collection	No	No	Yes
MV	Well	35° 14' 23.943" N	107° 53' 7.659" W	75.5-105	105.2	1.3	4.5	Alluvium	Collection	Yes	Yes	Yes
T11	Well	35° 14' 43.424" N	107° 52' 1.925" W	113-193	193.0	2.7	5	Alluvium	Collection	Yes	Yes	Yes
CE7	Well	35° 14' 24.304" N	107° 51' 59.604" W	100-140	140.0	1.9	6	Upper Chinle	Collection	No	No	Yes
CW18	Well	35° 13' 17.766" N	107° 51' 43.923" W	177-232	232.0	1.5	5	Upper Chinle	Monitoring	No	No	Yes
CW50	Well	35° 15' 4.220" N	107° 51' 46.606" W	130-170	170.9	3.0	5	Upper Chinle	Monitoring	No	No	Yes
ACW	Well	35° 14' 0.392" N	107° 52' 23.817" W	265-325	325.0	1.2	6	Middle Chinle	Domestic	No	No	Yes
CW1	Well	35° 14' 49.856" N	107° 51' 57.014" W	212-323	325.0	0.7	5	Middle Chinle	Monitoring	No	No	Yes
CW15	Well	35° 13' 21.056" N	107° 52' 49.219" W	73-133	134.6	2.6	5	Middle Chinle	Monitoring	No	No	Yes
CW2	Well	35° 14' 49.629" N	107° 51' 44.872" W	306-353	355.0	1.7	5	Middle Chinle	Monitoring	No	No	Yes
CW28	Well	35° 13' 9.727" N	107° 51' 48.375" W	280-360	370.0	1.9	5	Middle Chinle	Collection	No	No	Yes
CW45	Well	35° 13' 8.979" N	107° 52' 6.630" W	163-193	193.0	0.6	5	Middle Chinle	Monitoring	No	No	Yes
CW37	Well	35° 13' 30.758" N	107° 53' 2.582" W	100-150	150.1	1.3	5	Lower Chinle	Monitoring	No	No	Yes
SP2	--	--	--	--	--	--	--	--	RO permeate blended with San Andres-Glorietta Aquifer water	No	No	Yes
DD-BK	Borehole	35° 15' 7.169" N	107° 52' 15.632" W	--	85	--	6	Alluvium	Filled/abandoned	--	--	--
DD2-BK	Borehole	35° 15' 12.222" N	107° 52' 11.586" W	--	100	--	6	Alluvium	Filled/abandoned	--	--	--

Notes:
-- = not applicable or not currently available
ft = feet
ft amsl = feet above mean sea level
ft bgs = feet below ground surface
RO = reverse osmosis plant
N = north
W = west

Sources: Background WQ Report 2004, Corrective Action Plan, Environmental Quality Information System database records. Information from wells subjected to geophyscial logging was obtained during the 2016 USGS SSE
Bottom of screen interval used if total depth is less than screen interval

Table 3
2016 USGS SSE Laboratory Analyses by Well
Grants Reclamation Project

Laboratory		Energy Laboratories												Isotope Tracer Technologies, Inc.					Dissolved and Noble Gas Lab, University of Utah		
Method		SM 2320B	SM 5310C	EPA 300.0	EPA 200.7	EPA 200.7/200.8	EPA 353.2	SM 4500	EPA 900.0	EPA 903.0	RA-05	ASTM D6972-92	EPA 908.0	IT2 SOP	IT2 SOP	IT2 SOP	IT2 SOP	IT2 SOP	DNGL SOP	DNGL SOP	DNGL SOP
Well sampling location	Aquifer	Alkalinity as $CaCO_3$	Total Organic Carbon	Major Anions[a]	Major Cations[b]	Trace Elements[c]	Nitrate as N	Ammonia as N	Gross alpha (total)	Radium-226	Radium-228	Radon-222	Uranium-234, -235, -238	Stable Isotopes of Water[d]	Sulfur Isotopes[e]	Nitrogen Isotopes[f]	Carbon Isotopes[g]	Carbon-14	Helium Dating	Tritium Dating	CFC Dating
920	Far Upgradient Alluvium	X	X	X	X	X	X	X	X	X	X	X	X	X			X		X		
DD	Near Upgradient Alluvium	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		
DD2	Near Upgradient Alluvium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
ND	Near Upgradient Alluvium	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X
Q	Near Upgradient Alluvium	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		
P3	Near Upgradient Alluvium	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X		
ST	Alluvium	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		
MV	Alluvium	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		
T11	Alluvium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
CE7	Upper Chinle	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	
CW18	Upper Chinle	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
CW50	Upper Chinle	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		
ACW	Middle Chinle	X	X	X			X	X	X	X	X	X	X	X	X		X	X	X	X	
CW1	Middle Chinle	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		
CW15	Middle Chinle	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		
CW2	Middle Chinle	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X
CW28	Middle Chinle	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		
CW45	Middle Chinle	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	
CW37	Lower Chinle	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SP2	RO permeate blended with San Andres-Glorietta Aquifer water	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		

Notes:

[a] Bromine, chlorine, fluoride, sulfate.

[b] Calcium, magnesium, sodium, potassium.

[c] Total and dissolved: Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lithium, lead, manganese, molybdenum, nickel, selenium, silicon, silver, thallium, uranium, vanadium, zinc.

[d] Ratios of deuterium to hydrogen and oxygen-18 to oxygen-16.

[e] $\delta^{34}S, \delta^{32}S$

[f] δ15N of NO3, δ14N of NO3, δ18O of NO3,δ16O of NO3

[g] δ13C of DIC, δ13C of DOC, δ12C of DIC,δ12C of DOC

ASTM = ASTM International

$CaCO_3$ = calcium carbonate

CFC = chlorofluorocarbon sampling

DNGL = Dissolved and Noble Gas Lab, University of Utah

EPA = United States Environmental Protection Agency

IT2 = Isotope Tracer Technologies, Inc.

RO = Reverse Osmosis

SM = Standard Method

SOP = standard operating procedure

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Table 4
2018 Soil Investigation Geochemical and Mineralogical Analyses and Methods
Grants Reclamation Project

Analyte	Method	Supporting Detail and Analysis Goal
Field radioactivity survey (α-β-γ)[a]	Ludlum 2241 ratemeter with 44-9 pancake detector	Analysis of radioactivity in each section of core enabled collection of targeted samples that displayed the highest radioactivity and therefore the highest probability of encountering the disseminated uranium minerals known to be present in the alluvium of the San Mateo Valley.
Total metals in soil[b]	USEPA 3050B with 6020B	Analysis of total metals in soil was necessary to provide an understanding of the geochemical behavior of constituents of concern in the alluvial aquifer and alluvial sediments; this analysis also served as a basis for the leachable metals data generated through the modified USEPA method 1312: SPLP with alkaline extraction.
Leachable metals in soil[c]	Modified USEPA 1312: SPLP with alkaline extraction	Standard SPLP analyses employ an acidic leaching solution, which is not applicable to the San Mateo Valley that exhibits groundwater pH around 8. Additionally, carbonate, a constituent whose concentration is directly dependent on pH, is arguably the most important constituent to uranium(VI) solubility and mobility. This alkaline extraction, based on findings by Kohler et al. 2004, demonstrates how uranium is likely to behave in the San Mateo Valley alluvial aquifer and sediments.
Precise mineralogy	Petrographic analysis	Petrographic analysis via light and polarized light microscopy produces a definitive mineralogic assessment of alluvial aquifer sediments, including identification of small mineral grains, which cannot be resolved through x-ray diffraction.
Mineralogy and elemental composition	SEM analysis with EDX	Scanning electron microscophy with energy dispersive x-ray spectroscopy enabled classification of minerals through gross morphological identification and elemental composition. It also indicated whether elements were part of a crystal structure, or if it was only present as a coating on the mineral's surface or an inclusion within a larger mineral matrix (immobile constituent). SEM-EDS provides a more complete understanding of where the target element most commonly resides within a mineralogical community, whether it is more commonly present as large or small grains, and is essential to characterizing the past, current, and future behavior of a constituent.
Bulk mineralogy	XRD - scan and search	X-ray diffraction analysis provided positive identification of a wide variety of mineral constituents in samples. In contrast to petrographic and SEM-EDS analyses, which requires manual microscopic exploration and targeted identification, XRD is most valuable as a bulk assessment of mineralogy and yields essential data about mineralogic variability throughout the alluvial aquifer. Based on previous characterization of uranium in the San Mateo Valley alluvial system, the majority of the uranium was expected to be encountered in coarse-grained sands and possibly silts; thus, the "scan and search" of XRD method was expected to be sufficient. However, if samples that exhibit the highest uranium are predominantly clay, a directed clay XRD analysis must be used instead.
Grain size	Particle size distribution	Particle size distribution analysis was used to measure the grain sizes of sediment/soil particles a sample. Grain size is the most important factor determining the ability of water to move through an aquifer and can have major effects on residence time and geochemical behavior dependent water-mineral interactions, such as constituent phase (solid or dissolved) and constituent concentration in pore water.

Notes:

[a] Total α-β-γ (alpha-beta-gamma radiation) will be measured to include all possible radiogenic material in the alluvial aquifer

b Will be analyzed for aluminum, calcium, iron, molybdenum, phosphorus, potassium, selenium, sodium, uranium, vanadium

[c] Will be analyzed for molybdenum, selenium, uranium, vanadium

[d] Kohler, M., G.P. Curtis, D.E. Meece, and J.A. Davis. 2004. Methods for Estimating Adsorbed Uranium(VI) and Distribution Coefficients of Contaminated Sediments. Environmental Science and Technology. 38, 240-247.

EDS = energy dispersive x-ray spectroscopy

USEPA = United States Environmental Protection Agency

SEM = scanning electron microscopy

SPLP = Synthetic Precipitation Leaching Procedure

XRD = x-ray diffraction

Table 5
2018 Soil Investigation Samples
Grants Reclamation Project

						Laboratory	Energy Laboratories, Incorporated		DCM Science Laboratory[c]	ACZ Laboratories
Borehole or Near Upgradient Alluvium	Sample ID	Date (mm/dd/yy)	Time	Depth range (feet below ground surface)	Lithology as Logged in the Field	Field radioactivity survey (α-β-γ) (cpm)	EPA 3050B with 6020B; Total metals in soil[a]	Modified EPA 1312, SPLP, 4h extraction; Leachable metals in soil[b]	Microscopy and spectroscopy[d]	Particle Size Analysis[e]
DD-BK	DD-BK-9-10-012518	01/25/18	1550	9–10	Clay with trace sand	130	X	X	X	X
DD-BK	DD-BK-15-16-012518	01/25/18	1605	15–16	Fine to medium sand with stone and silt	126	X	X	X	X
DD-BK	DD-BK-30-31-012518	01/25/18	1620	30–31	Silty sand and gravel	111	X	X	X	X
DD-BK	DD-BK-36-37-012518	01/25/18	1640	36–37	Clay	104	X	X	X	X
DD-BK	DD-BK-50-51-012518	01/25/18	1710	50–51	Silty fine to coarse sand	90	X	X	X	X
DD-BK	DD-BK-66-67-012518	01/25/18	1725	66–67	Silty fine sand	81	X	X	X	--
DD-BK	DD-BK-27-28-012618	01/26/18	1300	27–28	Fine to coarse sand with trace silt	97	X	X	X	--
DD-BK	DD-BK-39-40-012618	01/26/18	1320	39–40	Silty fine sand with hard layer	72	X	X	X	--
DD-BK	DD-BK-58-59-012618	01/26/18	1330	58–59	Clay	89	X	X	X	--
DD-BK	DD-BK-63-64-012618	01/26/18	1400	63–64	Silty fine sand	66	X	X	X	--
DD2-BK	DD2-BK-11-12-012218	01/22/18	1509	11–12	Gray clay	98	X	X	X	X
DD2-BK	DD2-BK-25-26-012218	01/22/18	1520	25–26	Silty brown sand with calcified layer	97	X	X	X	X
DD2-BK	DD2-BK-51-52-012318	01/23/18	1250	51–52	Silty sand	106	X	X	X	--
DD2-BK	DD2-BK-56-57-012318	01/23/18	1315	56–57	Clay	120	X	X	X	--
DD2-BK	DD2-BK-71-72-012318	01/23/18	1330	71–72	Sand/gravel with some silt	71	X	X	X	X
DD2-BK	DD2-BK-65-66-012318	01/23/18	1420	65–66	Fine sandy silt	107	X	X	X	--
DD2-BK	DD2-BK-36-37-012618	01/26/18	1450	36–37	Silty fine sand	90	X	X	X	X
DD2-BK	DD2-BK-60-61-012618	01/26/18	1505	60–61	Clay	95	X	X	X	--
DD2-BK	DD2-BK-67-68-012618	01/26/18	1535	67–68	Silty sand/clay	84	X	X	X	--
DUP	DUP name: DUP Parent sample: DD2-BK-51-52-012318	01/23/18	1250	51–52	Silty sand	106	X	X	--	--
MS/MSD	Parent sample: DD2-BK-25-26-012218	43122	1520	25–26	Silty brown sand with calcified layer	97	X	--	--	--

[a] Analyzed for aluminum, calcium, iron, molybdenum, phosphorus, potassium, selenium, sodium, uranium, vanadium

[b] Analyzed for molybdenum, selenium, uranium, vanadium

[c] DCM was subcontracted through ELI

[d] Microscopy samples were collected, homogenized in their sample container, and packaged in the field, and were sent to ELI along with the Total metals and Leachable metals samples; all microscopy samples were retained by ELI until Arcadis reviewed data from the Total metals and Leachable metals analyses. Arcadis then selected 8 microscopy samples to be shipped by ELI to DCM for analysis.

[e] A maximum of 5 particle size distribution samples were collected from both DD-BK and DD2-BK; samples covered a range of lithologies (e.g., sand, silt, and clay).

-- = no sample collected/sample not analyzed by this method
X = sample collected
α-β-γ = alpha-beta-gamma radiation
ACZ = ACZ Laboratories in Steamboat Springs, Colorado
DCM = DCM Science Laboratory, Incorporated in Wheat Ridge, Colorado
DD-BK = boring designation for location closest to existing well DD
DD2-BK = boring designation for location closest to existing well DD2
DUP = duplicate measurement/sample
ELI = Energy Laboratories, Incorporated in Casper, Wyoming
EPA = United States Environmental Protection Agency
MS/MSD = matrix spike/matrix spike duplicate; MS/MSD sample volumes are taken from existing samples and do not require a separate sample ID
SPLP = Synthetic Precipitation Leaching Procedure

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Table 6
HMC Field and Laboratory Volumetric Purge Sample Analytical Data, 2016 SSE
Grants Reclamation Project

		Location	0920	ACW	CE7	CW1	CW15	CW18	CW2	CW28	CW37	CW45	CW50	DD	DD2	MV	ND	P3	Q	SP2	ST	T11
		Date	10/6/2016	10/6/2016	10/7/2016	10/5/2016	10/5/2016	10/7/2016	10/4/2016	10/6/2016	10/8/2016	10/7/2016	10/6/2016	10/6/2016	10/7/2016	10/5/2016	10/4/2016	10/4/2016	10/6/2016	10/4/2016	10/6/2016	10/7/2016
Chemical Name	F	Units																				
Field Measurements																						
Dissolved Oxygen		mg/l	0.12	0.07	6.28	0.27	0.34	2.46	0.18	2.44	0.95	3.81	0.06	3.37	NA	2.87	6.07	1.98	0	7.39	0.15	
Iron (Ferrous)	D	mg/l	0	0.09	0	0	0.05	0	NA	0.28	0	0	0.05	0	0.26	0.06	0.52	0.06	0	6	0	0.01
ORP		mV	41	-20.7	97.5	154.6	98.6	15.4	135.1	106.9	109.9	94.6	37.5	76.2	72.6	77.6	75.5	62.9	72.4	53.4	126.4	80.2
pH		pH units	7.22	8.58	7.41	8.6	8.32	7.21	8.63	8.56	7.44	7.25	7.33	7.15	6.88	6.95	7.82	7.41	7.21	6.78	7.28	9.69
Specific Conductivity		mS/cm	3.073	2.702	9.385	2.409	2.438	3.015	2.132	1.799	2.124	1.985	2.204	4.057	3.165	2606	2.666	3.343	2.204	1.036	3.918	9.989
Temperature		deg C	13.3	13.2	14.5	15.9	12.6	12.9	15.1	14.5	13	13.7	13.3	13.6	13.1	14.3	13	12.9	13	15.5	14	14.9
Turbidity		ntu	0.76	1.75	5.11	0.21	0.38	0.37	0.42	1.6	0.17	1.07	0.27	2.66	0.61	0.58	1.98	0.37	0.34	0.45	1.05	3.15
Laboratory Analytical - Nutrients and Anions																						
Alkalinity (as CaCO3)	T	mg/l	202	411	1190	296	277	592	365	333	226	435	286	238	291	419	260	173	188	32	729	2140
Ammonia Nitrogen	T	mg/l	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.11	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.034 J
Bromide	T	mg/l	0.36 J	0.39 J	1 DJ	0.4 J	0.33 J	0.36 J	0.47 J	0.41 J	0.6	0.33 J	0.41 J	0.5	0.5	0.36 J	1.1	0.7	0.6	0.14 J	0.6	0.8 DJ
Chloride	T	mg/l	65	148	566 D	97	38	234	129	144	86	165	68	79	73	222	93	81	73	47	340 D	410 D
Fluoride (F-, Anion)	T	mg/l	0.3	0.6 D	1.2 D	0.9 D	0.6 D	0.3	0.6 D	1.4 D	0.6 D	0.6 D	0.4 D	0.5 D	0.2	0.3	0.8 D	0.5 D	0.3	0.06 J	0.6	5 D
Nitrate/Nitrite	T	mg/l	10 D	2.2 D	4.5 D	2.6 D	1.5	1.8 D	2 D	1	5.9 D	1.8 D	0.1	16 D	0.1 U	1.7 D	2.9 D	12 D	16 D	0.8	1.3	0.3
Sulfate	T	mg/l	1750 D	750 D	4670 D	999 D	938 D	774 D	643 D	513 D	1180 D	673 D	931 D	2330 D	1650 D	826 D	988 D	1180 D	1770 D	244	1850 D	3270 D
Total Organic Carbon	T	mg/l	1.7	1.2	6.2	1.1	1.1	0.7	0.9	0.6	2.1	0.6	1.3	2.6	1.8	0.8	2.8	1.6	1.8	0.1 J	2.5	22.2 D
Laboratory Analytical - Major Cations and Metals/Metalloids																						
Aluminum	D	mg/l	0.0089 J	0.03 U	0.02 J	0.0023 J	0.0017 J	0.01 J	0.01 J	0.0017 J	0.0081 J	0.01 J	0.0088 J	0.0055 J	0.0086 J	0.0026 J	0.0032 J	0.0037 J	0.0022 J	0.027 J	0.0065 J	0.04
	T	mg/l	0.0046 J	0.02 J	0.14	0.0072 J	0.0098 J	0.014 J	0.03 U	0.04	0.0057 J	0.01 J	0.0038 J	0.015 J	0.0063 J	0.0055 J	0.04	0.0053 J	0.0051 J	0.06	0.0045 J	0.1
Antimony	D	mg/l	0.001 U	0.001 U	0.003 UD	0.001 U	0.001 U	0.003 D	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
	T	mg/l	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UB	0.001 U	0.001 U	0.001 U	0.001 U	0.00027 J	0.001 U	0.001 U	0.00011 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0007 J
Arsenic	D	mg/l	0.01	0.003	0.035	0.003	0.002	0.001 U	0.004	0.003	0.004	0.002	0.001 U	0.001 UB	0.0006 J	0.001 UB	0.007	0.009	0.007	0.00027 J	0.006	0.097
	T	mg/l	0.004	0.0008 J	0.031	0.003	0.003	0.00048 J	0.003	0.004	0.001 U	0.002	0.001 U	0.002	0.0003 J	0.001 UB	0.006	0.008	0.008	0.00036 J	0.006	0.086
Barium	D	mg/l	0.0095 J	0.014 J	0.011 J	0.01 J	0.008 J	0.024 J	0.017 J	0.012 J	0.0067 J	0.011 J	0.012 J	0.0087 J	0.012 J	0.014 J	0.021 J	0.013 J	0.011 J	0.0019 J	0.015 J	0.029 J
	T	mg/l	0.0094 J	0.014 J	0.01 J	0.011 J	0.0078 J	0.025 J	0.016 J	0.012 J	0.0065 J	0.012 J	0.012 J	0.0087 J	0.013 J	0.014 J	0.019 J	0.012 J	0.01 J	0.0018 J	0.014 J	0.033 J
Beryllium	D	mg/l	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00003 J	0.001 U	0.001
	T	mg/l	0.001 U	0.001 U	0.000078 J	0.001 U	0.000064 J	0.000088 J	0.001 U	0.00016 J	0.000017 J	0.000069 J	0.0000087 J	0.0001 J	0.00008 J	0.001 U	0.001 U	0.000015 J	0.000024 J	0.001 U	0.000071 J	0.00018 J
Boron	D	mg/l	0.21	0.71	0.6 D	0.82	0.63	1.02	0.72	1.13	0.31	0.59	0.34	0.44	0.35	0.68	0.49	0.21	0.25	0.36	0.75 D	0.6 D
	T	mg/l	0.21	0.69	0.5 D	0.83	0.59	1.05	0.69	1.06	0.3	0.61	0.35	0.41	0.35	0.65	0.47	0.2	0.23	0.35	0.67	0.5 D
Cadmium	D	mg/l	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00004 J	0.001
	T	mg/l	0.001 U	0.000084 J	0.003	0.001 U	0.001 U	0.001 U	0.001 U	0.000037 J	0.000037 J	0.000018 J	0.001 U	0.001 U	0.00001 J	0.001 U	0.000032 J	0.000054 J	0.0000044 J	0.000026 J	0.00068 J	0.004
Calcium	D	mg/l	416	6.8	163	14.4	22.4	45.3	8	6.5	161	154	181	509	335	233	68.4	276	385	54.9	221	21
	T	mg/l	414	6.8	164	14.9	26.9	47	8	6.2	153	160	187	482	345	240	65.4	275	410	50.9	205	21.9
Chromium	D	mg/l	0.005 UB	0.0008 J	0.005	0.005 UB	0.005 U	0.00025 J	0.00015 J	0.005 UB	0.00043 J	0.001 J	0.005 UB	0.005 UB	0.00047 J	0.005 UB	0.0019 J	0.00058 J	0.005 UB	0.005 U	0.005 U	0.004 J
	T	mg/l	0.005 U	0.00035 J	0.0013 J	0.0015 J	0.00028 J	0.00026 J	0.0002 J	0.00068 J	0.00035 J	0.00046 J	3.00E-05	0.00065 J	0.00002 J	0.0021 J	0.0019 J	0.00077 J	0.00018 J	0.00023 J	0.005 UB	0.0031 J
Cobalt	D	mg/l	0.0021 J	0.005 U	0.0013 J	0.00014 J	0.00011 J	0.00022 J	0.000088 J	0.00008 J	0.00084 J	0.00077 J	0.00088 J	0.0037 J	0.0025 J	0.0012 J	0.00043 J	0.0013 J	0.0021 J	0.00024 J	0.0012 J	0.0024 J
	T	mg/l	0.0025 J	0.00015 J	0.002 J	0.000098 J	0.0002 J	0.00035 J	0.005 U	0.00013 J	0.00065 J	0.0013 J	0.0012 J	0.004 J	0.0032 J	0.0014 J	0.00036 J	0.00056 J	0.0027 J	0.00015 J	0.0016 J	0.0033 J
Copper	D	mg/l	0.005 U	0.0006 J	0.007	0.005 UB	0.0013 J	0.001 J	0.00029 J	0.005 U	0.005 U	0.007	0.005 U	0.0032 J	0.005 U	0.0033 J	0.0014 J	0.00076 J	0.00073 J	0.014	0.005 U	0.014
	T	mg/l	0.0022 J	0.008	0.009	0.00074 J	0.0011 J	0.00056 J	0.0023 J	0.00075 J	0.0044 J	0.00021 J	0.00065 J	0.0015 J	0.00028 J	0.0032 J	0.005	0.0021 J	0.00066 J	0.014	0.002 J	0.03
Iron	D	mg/l	0.03 U	0.07	0.05 D	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.024 J	0.03 U	0.92	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.04
	T	mg/l	0.03 U	0.97	0.1	0.03 U	0.006 J	0.01 J	0.06	0.026 J	0.03 U	0.005 J	0.028 J	0.01 J	0.85	0.03 U	0.029 J	0.003 J	0.03 U	0.006 J	0.03 U	0.1 D
Lead	D	mg/l	0.001 U	0.001 U	0.0002 J	0.001 U	0.001 U	0.001 U	0.00004 J	0.001 U	0.001 U	0.001 U	0.001 U	0.00007 J	0.001 U	0.001 U	0.00013 J	0.001 U	0.001 U	0.00002 J	0.001 U	0.001 U
	T	mg/l	0.00006 J	0.00094 J	0.00016 J	0.001 U	0.00003 J	0.001 U	0.0001 J	0.00027 J	0.00004 J	0.00003 J	0.001 U	0.00014 J	0.001 U	0.001 U	0.00089 J	0.00011 J	0.00004 J	0.00008 J	0.00033 J	0.0004 J
Lithium	D	mg/l	0.1	0.3	0.1	0.2	0.2	0.7	0.3	0.2	0.2	0.1	0.1 J	0.2	0.2	0.5	0.098 J	0.091 J	0.1	0.1	0.5	0.057 J
	T	mg/l	0.1	0.3	0.1	0.2	0.2	0.7	0.2	0.2	0.2	0.1	0.1	0.3	0.2	0.4	0.097 J	0.091 J	0.1	0.1	0.5	0.05 J
Magnesium	D	mg/l	78.4	1.5	72.4	2.7	5.6	9	1.5	1.2	63.5	40.9	47.5	109	85.3	65.1	18.2	50.8	75.8	15.8	73.4	18.2
	T	mg/l	78.8	1.4	72.2	2.6	6.9	9.3	1.4	1	62.2	43	48.9	106	86.5	63	17.8	49.4	72.3	14.8	69.3	17.8
Manganese	D	mg/l	0.004	0.017	0.005	0.008	0.001 U	0.0009 J	0.006	0.00073 J	0.002	0.001 U	0.6	0.383	2.46 D	0.001 UB	0.00032 J	0.002	0.08	0.003	0.058	0.051
	T	mg/l	0.003	0.035	0.007	0.01 J	0.001	0.00059 J	0.007	0.002	0.002	0.001 U	0.647	0.39	2.45	0.00098 J	0.002	0.005	0.096	0.003	0.079	0.056

Table 6, continued
HMC Field and Laboratory Volumetric Purge Sample Analytical Data, 2016 SSE
Grants Reclamation Project

		Location	0920	ACW	CE7	CW1	CW15	CW18	CW2	CW28	CW37	CW45	CW50	DD	DD2	MV	ND	P3	Q	SP2	ST	T11
		Date	10/6/2016	10/6/2016	10/7/2016	10/5/2016	10/5/2016	10/7/2016	10/4/2016	10/6/2016	10/8/2016	10/7/2016	10/6/2016	10/6/2016	10/7/2016	10/5/2016	10/4/2016	10/4/2016	10/6/2016	10/4/2016	10/6/2016	10/7/2016
Chemical Name	F	Units																				
Molybdenum	D	mg/l	0.001	0.004	26	0.024	0.003	0.029	0.009	0.012	0.001	0.004	0.002	0.002	0.001	0.02	0.005	0.001	0.002	0.011	6.8	23.2
	T	mg/l	0.0008 J	0.003	26.6	0.028	0.004	0.024	0.01	0.016 UB	0.137	0.003	0.002	0.001	0.001	0.021	0.005	0.002	0.002	0.011	7.58	23.4
Nickel	D	mg/l	0.0018 J	0.0004 J	0.006	0.005 UB	0.005 UB	0.0006 J	0.00009 J	0.005 UB	0.0011 J	0.015	0.0011 J	0.005 UB	0.0026 J	0.005 UB	0.00027 J	0.00099 J	0.005 UB	0.00049 J	0.005 UB	0.017
	T	mg/l	0.00068 J	0.0004 J	0.0037 J	0.00007 J	0.00027 J	0.00029 J	0.00012 J	0.00038 J	0.00062 J	0.00072 J	0.00023 J	0.0016 J	0.0022 J	0.0015 J	0.00027 J	0.00046 J	0.0018 J	0.00039 J	0.0015 J	0.019
Potassium	D	mg/l	9.1	1.6	5.2 D	1.5	1.9	2.4	1.3	1.2	5.9	4.7	3.7	6.2	5.8	8.2	1.1	5.4	7.3	1.8	5.6	4.2 D
	T	mg/l	9.2	1.6	5.3	1.5	1.9	2.4	1.3	1.1	5.9	4.7	3.9	6.1	5.9	8.1	1.1	5.3	6.9	1.9	5.1	4.6 D
Selenium	D	mg/l	0.278	0.059	0.738	0.045	0.015	0.016	0.046	0.051	0.067	0.036	0.001 U	0.114	0.0005 J	0.033	0.131	0.276	0.416	0.009	0.176	0.144 D
	T	mg/l	0.275	0.059	0.87	0.044	0.015	0.022	0.04	0.047	0.065	0.035	0.001 U	0.103 D	0.00057 J	0.031	0.115	0.254	0.38	0.008	0.153	0.151
Silicon	D	mg/l	9.1	4.5	11.1	4.2	4.1	7.4	4.7	4.8	7.1	15.9	7.5	7.9	7.5	12.4	8.5	9.2	8.5	5.5	10	5.9
	T	mg/l	9.1	4.5	11.4 D	4.3	4.1	7.7	4.8	4.8	7	15.8	7.7	7.9	7.5	12.4	8.7	8.9	8.2	5.1	9.4	6.2 D
Silver	D	mg/l	0.001 U	0.001 U	0.004 UD	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 UD
	T	mg/l	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00057 J	0.00021 J	0.001 U	0.001 U	0.001 U	0.003 UD
Sodium	D	mg/l	252	578	2500 D	580	497	641	526	443	338	311	266	392	311	275	526	276	284	68.1	904 D	2520 D
	T	mg/l	256 D	582	2510 D	586	482	668 D	513	428	337	323 D	279 D	388	320 D	271	511	264	273	63	850 D	2630 D
Thallium	D	mg/l	0.0005 U	0.0005 U	0.0006 UD	0.0005 U	0.0005 U	0.005 D	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.00002 J	0.0005 U	0.0006 D
	T	mg/l	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.002	0.0018	0.0005 U	0.00013 J	0.0005 U	0.0004 J
Vanadium	D	mg/l	0.00038 J	0.0036 J	0.02	0.006 J	0.0055 J	0.0027 J	0.01 U	0.01	0.003 J	0.0032 J	0.00039 J	0.00025 J	0.00044 J	0.0018 J	0.008 J	0.01 U	0.00056 J	0.01 U	0.0023 J	0.09
	T	mg/l	0.01 U	0.0039 J	0.03	0.006 J	0.0056 J	0.0034 J	0.0058 J	0.01	0.0031 J	0.0039 J	0.01 U	0.01 U	0.01 U	0.002 J	0.0075 J	0.00043 J	0.00048 J	0.00017 J	0.0027 J	0.09
Zinc	D	mg/l	0.0013 J	0.03	0.02	0.00039 J	0.0013 J	0.00033 J	0.00024 J	0.00053 J	0.0021 J	0.00066 J	0.004 J	0.03	0.01	0.0048 J	0.02	0.0013 J	0.0035 J	0.0017 J	0.0068 J	0.0093 J
	T	mg/l	0.001 J	0.31	0.0058 J	0.0005 J	0.0032 J	0.0007 J	0.0011 J	0.0018 J	0.0032 J	0.0008 J	0.0039 J	0.02	0.0081 J	0.0032 J	0.02	0.0011 J	0.0033 J	0.0017 J	0.0014 J	0.01 J
Laboratory Analytical - Radionuclides																						
Gross Alpha	T	pci/l	173	51.6	11200	49	35.1	36.6	34	37	23.6	298	28.6	73.1	225	152	7.3	18.1	37	7.3	3050	4720
Gross Beta	T	pci/l	61.6	10.9	3530	14.4	9.3	5.8 U	9.7	7.4 U	12.5	66	16.7	24.5	41.1	78.7	7.3	10.4	20.3	3.3	1280	2870
Radium-226	T	pci/l	0.27	0.15 U	0.28	0.15 U	0.17 U	0.31	0.12 U	0.17 U	0.36	0.36	0.68	0.32	0.61	0.2	0.23	0.24	0.31	0.08 U	0.08 U	4.5
Radium-228	T	pci/l	0.33 U	-0.2 U	5.7	0.53 U	1.6 U	13	0.31 U	0.22 U	1.9	0.61 U	1.5 J	1 U	2.1	0.78 U	0.37 U	0.21 U	0.37 U	0.51 U	0.58 U	1.1 U
Radon-222	T	pci/l	724	279	1410	465	320	730	295	491	223	653	1340	463	1260	646	303	874	719	9 U	1420	807
Uranium	D	mg/l	0.23	0.0436	17.5	0.044	0.0279	0.0471	0.0404	0.0265	0.0253	0.319	0.0268	0.0944	0.218	0.249	0.0195	0.0201	0.0523	0.0071	4.49	8.39
	T	mg/l	0.226	0.0465	16.5	0.0372	0.0286	0.0538	0.0401	0.0275 UB	0.0274	0.402	0.0283	0.0869	0.221	0.242	0.0188	0.0209	0.0525	0.0089	4.82	8.22
Uranium, Activity	D	pci/l	156	29.5	11900	29.8	18.9	31.9	27.3	18	17.1	216	18.1	63.9	147	169	13.2	13.6	35.4	4.8	3040	5680
	T	pci/l	153	31.5	11200	25.2	19.4	36.5	27.2	18.6	18.6	272	19.2	58.8	150	164	12.8	14.1	35.6	6	3260	5570
Uranium-234	T	pci/l	92.9	37.7	5260	28	22.3	18.1	35.7	26.7	14.9	128	12.3	39.6	89.6	79.9	9.3	9.5	20.4	3.7	1700	2680
Uranium-235	T	pci/l	3.6	0.8	285	0.4	0.4	0.4	0.7	0.6	0.5	3.7	0.4	1.3	3	3.3	0.3	0.6	0.7	0.2	75.7	120
Uranium-238	T	pci/l	73.2	16.9	5340	13.7	8.1	8.5	14.8	8.7	9	115	10.1	27.3	60.5	73.5	6.6	6.8	16.4	2.8	1660	2620

F = fraction
T = total (unfiltered fraction)
D = dissolved (filtered (0.45 µm)) fraction
ORP = oxidation-reduction potential
NA = not analyzed
Result Flags:
U = not detected
D = sample was diluted
J = estimated value
mg/l = milligrams per liter
pCi/l = picocuries per liter
mV = millivolts
mS/cm = microSiemens per centimeter
deg C = degrees Celscius
ntu = nephelometric turbidity units

Table 7
2018 Soil Investigation Geochemical and Mineralogical Data
Grants Reclamation Project

Sample ID	Borehole	Depth (fbgs)	Total metals (mg/kg dry mass)										Synthetic precipitation leaching procedure[a] (mg/L)				Percent moisture	Lithology as logged in the field
			Aluminum	Calcium	Iron	Molybdenum	Phosphorus	Potassium	Selenium	Sodium	Uranium	Vanadium	Molybdenum	Selenium	Uranium	Vanadium		
DD-BK-9-10-012518	DD-BK	9-10	14500	19800	16600	<1 U	385	2340	<1 U	409	1	26	0.002	0.002	0.0022	<0.01 U	10.1	Clay with trace sand
DD-BK-15-16-012518	DD-BK	15-16	3150	954	4530	<1 U	69	467	<1 U	54	<1 U	7	0.002	<0.001 U	0.0018	0.07	2.7	Fine to medium sand with some silt
DD-BK-27-28-012618	DD-BK	27-28	1550	566	2740	<1 U	54	366	<1 U	62	<1 U	5	0.004	<0.001 U	0.0012	0.03	0.8	Fine to coarse sand with trace silt
DD-BK-30-31-012518	DD-BK	30-31	2750	10400	9340	<1 U	279	547	<1 U	76	<1 U	12	0.005	0.002	0.0032	0.07	1.4	Silty sand and gravel
DD-BK-36-37-012518	DD-BK	36-37	8920	20900	9930	<1 U	237	1470	<1 U	143	1	15	0.005	0.005	0.0127	0.1	6	Clay
DD-BK-39-40-012618	DD-BK	39-40	2960	6110	7700	1	109	744	<1 U	199	<1 U	9	0.014	0.002	0.007	0.13	3.9	Silty sand with hard layer
DD-BK-50-51-012518	DD-BK	50-51	1970	2400	5680	<1 U	211	339	<1 U	118	<1 U	7	0.004	<0.001 U	0.0059	0.06	9.6	Silty fine to coarse sand
DD-BK-58-59-012618	DD-BK	58-59	20000	11200	26100	<1 U	432	2890	<1 U	664	1	34	0.003	0.002	0.0032	0.03	19.5	Clay
DD-BK-63-64-012618	DD-BK	63-64	4590	9120	6140	<1 U	158	714	<1 U	205	<1 U	11	0.004	0.002	0.0075	0.13	13.1	Silty fine sand
DD-BK-66-67-012518	DD-BK	66-67	6870	16100	6670	<1 U	212	831	<1 U	221	<1 U	13	0.006	0.003	0.0118	0.1	14.4	Silty fine sand
DD2-BK-11-12-012218	DD2-BK	11-12	25300	20300	22200	3	528	4260	<1 U	727	10	34	0.042	0.001	0.179	0.02	21.2	Clay
DD2-BK-25-26-012218	DD2-BK	25-26	1730	12800	4550	<1 U	174	290	<1 U	77	1	7	0.033	<0.001 U	0.0477	0.03	3.1	Sand with trace silt
DD2-BK-36-37-012618	DD2-BK	36-37	2700	9140	4810	<1 U	212	503	<1 U	107	<1 U	8	0.009	0.003	0.009	0.06	8.1	Silty fine sand
DD2-BK-51-52-012318	DD2-BK	51-52	7940	4360	11000	<1 U	336	1370	<1 U	292	2	15	0.002	0.001	0.0086	<0.01 U	18.1	Silty sand
DD2-BK-56-57-012318	DD2-BK	56-57	23600	20800	20900	<1 U	498	3360	<1 U	695	1	29	0.005	0.002	0.0079	0.05	21	Clay
DD2-BK-60-61-012618	DD2-BK	60-61	21600	21500	19100	<1 U	512	2920	<1 U	625	2	32	0.005	0.002	0.0086	<0.01 U	23.6	Clay
DD2-BK-65-66-012318	DD2-BK	65-66	7610	22000	11100	<1 U	372	1300	<1 U	298	1	16	0.007	0.001	0.008	0.12	15.1	Fine sandy silt
DD2-BK-67-68-012618	DD2-BK	67-68	4530	14600	7940	<1 U	216	889	<1 U	172	1	11	0.007	0.002	0.018	0.12	14.9	Silty sand / Clay
DD2-BK-71-72-012318	DD2-BK	71-72	2290	42500	42700	1	574	298	2	160	5	20	0.004	0.011	0.0305	0.05	11.5	Gravely sand with some silt

[a] Modified synthetic precipitation leaching procedure described in Table 2
fbgs = feet below ground surface
mg/kg = milligram per kilogram
mg/L = milligram per liter
U = not detected; method detection limit shown

ED_004985_00011411-00069

Table 6
2018 Soil Investigation X-Ray Diffraction Data
Grants Reclamation Project

Sample ID	Borehole	Depth (fbgs)	Lithology as logged in the field	Total uranium (mg/kg)	Leached uranium (mg/L) [a]	Predevelopment groundwater zone	Quartz	K-Feldspar	Plagioclase	Calcite	Dolomite	Kaolinite	Illite/Mica	Smectite	Hematite	Ferrihydrite	Total clay	Smectite	Illite	Kaolin
DD-BK-9-10-012518	DD-BK	9-10	Clay with trace sand	1	0.0022	unsaturated	38	9	7	5	-	11	4	23	-	<5	-	--	--	--
DD2-BK-11-12-012218	DD2-BK	11-12	Clay	10	0.179	unsaturated	26	5	6	7	-	23	7	26	-	-	56	46	13	41
DD2-BK-25-26-012218	DD2-BK	25-26	Sand with trace silt	1	0.0477	unsaturated	78	9	5	3	-	-	3	-	-	<5	-	--	--	--
DD2-BK-51-52-012318	DD2-BK	51-52	Silty sand	2	0.0086	saturated	54	10	12	1	-	6	2	13	1	<5	-	--	--	--
DD2-BK-60-61-012618	DD2-BK	60-61	Clay with trace sand	2	0.0086	saturated	28	6	6	3	1	13	4	39	-	-	56	69	7	24
DD2-BK-71-72-012318	DD2-BK	71-72	Gravely sand with silt	5	0.0305	saturated	70	12	8	3	-	1	3	1	1	<5	-	--	--	--

Data from X-Ray Diffraction analysis by DCM Science Laboratory in Lakewood, Colorado unless otherwise noted.
[a] Data from Energy Laboratories, Inc. (ELI)
[b] Groundwater was encountered in borehole DD-BK around 45 ft bgs and in DD2-BK around 42 ft bgs
[c] Results from clay-sized fraction (<2 µm particles)
- = not detected above 1 percent
-- = not analyzed
µm = microns
fbgs = feet below ground surface
mg/kg = milligram per kilogram
mg/L = milligram per liter

FIGURES

CITY: (DENTECH) DIV/GROUP:(ENV) DB:KKELLEY LD: PIC: PM: TM: DATE: 9/20/2018
PROJECT: PATH: Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_1_Site_Map.mxd

n-17
920
n-16
R
DD2-BK
DD2
DD-BK
DD
CW50
P4
P3
ND
COUNTY ROAD 63
CW1
CW2
T11
LARGE TAILINGS PILE
(RECLAMATION IN PROGRESS)
MO
ST
MV
CE7
SP-2
605
COLLECTION POND
LINED EVAP. POND NO. 2
LINED EVAP. POND NO. 1
SMALL TAILINGS PILE
PLEASANT VALLEY ESTATES
MURRAY ACRES
ACW
VALLE VERDE
HIGHWAY 605
BROADVIEW ACRES
CW37
943
FELICE ACRES
CW15
CW18
RALPH CARD ROAD
THUNDERBIRD LANE
CW45
CW28
T12N R10W
T11N R10W
CW26

LEGEND

- RO Sampling Point
- Alluvial Aquifer Well
- Upper Chinle Aquifer Well
- Middle Chinle Aquifer Well
- Lower Chinle Aquifer Well
- San-Andres Glorietta Aquifer
- Borehole Location

N

0 2,000 4,000

SCALE IN FEET

Basemap features from: Hydro-Engineering, LLC, 2011

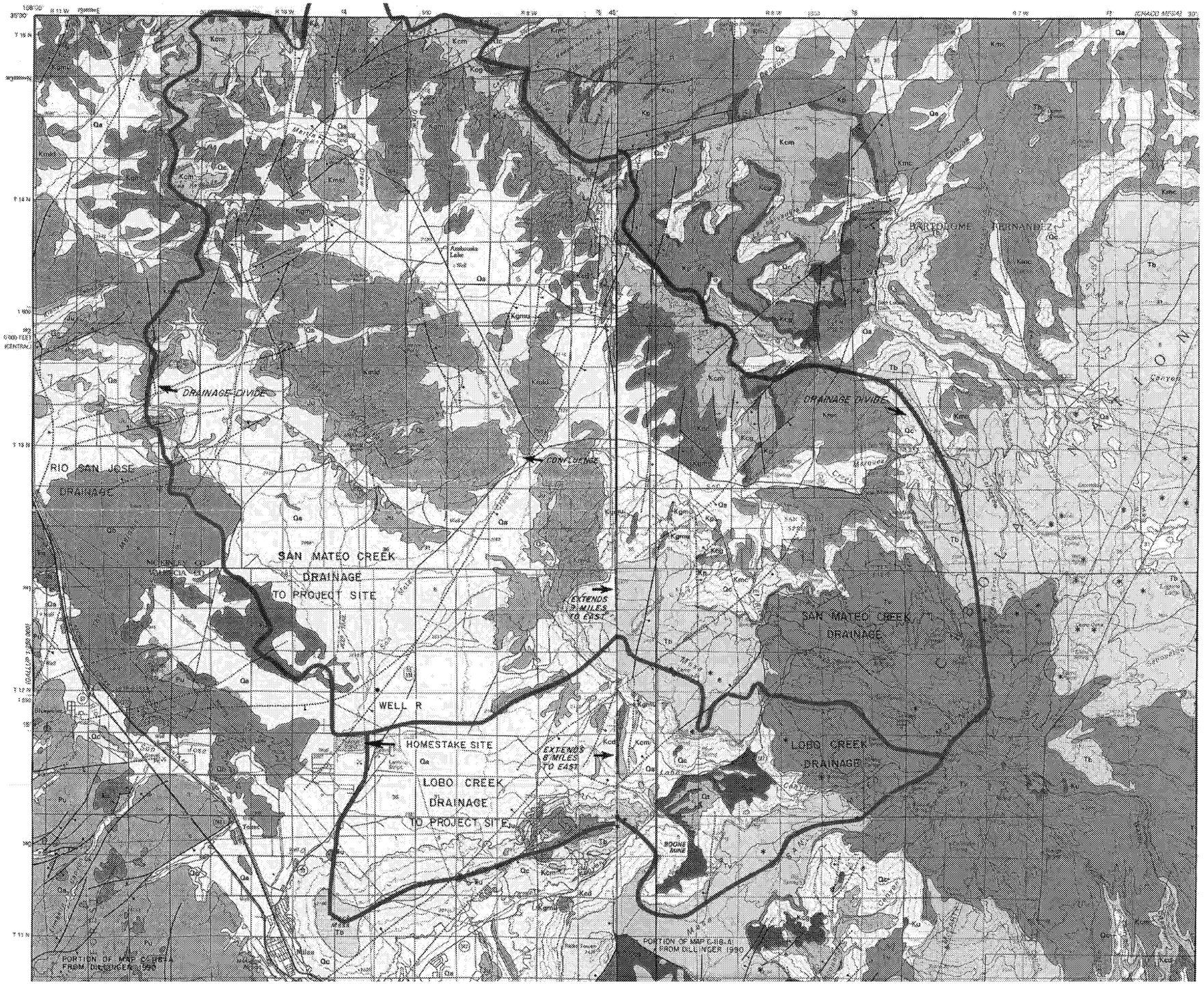
EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

SITE MAP

ARCADIS

FIGURE 1

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



LEGENDS: Correlation of Map Units

Alluvium Colluvium and Terrace Gravel	Qa, Qc, Qt	Holocene and Pleistocene	QUATERNARY	
Basalt Flows	Qb, Qtb		QUATERNARY OR TERTIARY	
Basalt Flows	Tb	Pliocene	TERTIARY	
Santa Fe Formation	Tu, Ts	Pliocene and Miocene	TERTIARY	
UNCONFORMITY				
Cleary Coal Member and Gibson Coal Member	Kmc, Kmm, Kp	Upper Cretaceous	CRETACEOUS	
Dilco Coal Member	Kcm, Kcd	Upper Cretaceous	CRETACEOUS	
Gallup Sandstone	Kgmu	Upper Cretaceous	CRETACEOUS	
Mancos Shale	Kmdu, Kmd	Upper Cretaceous	CRETACEOUS	
Dakota Sandstone	Kdm	Upper Cretaceous	CRETACEOUS	
UNCONFORMITY				
Morrison Formation, Eolian Sandstone, Wanakah Formation, Entrada Sandstone	Ju		JURASSIC	
UNCONFORMITY				
Chinle Formation, Moenkopi Formation	Tu		TRIASSIC	
UNCONFORMITY				
San Andres Limestone, Glorieta Sandstone, Yeso Formation, Abo Formation	Pu	Lower Permian	PERMIAN	
UNCONFORMITY				
Precambrian Granite	pCg		PRECAMBRIAN	

Source:
Dillinger, J.K., 1990, Geologic map of the Grants 30' x 60' quadrangle, west-central New Mexico: U.S. Geological Survey, Coal Investigation Map C-118-A, scale 1:100,000.

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

GEOLOGIC MAP

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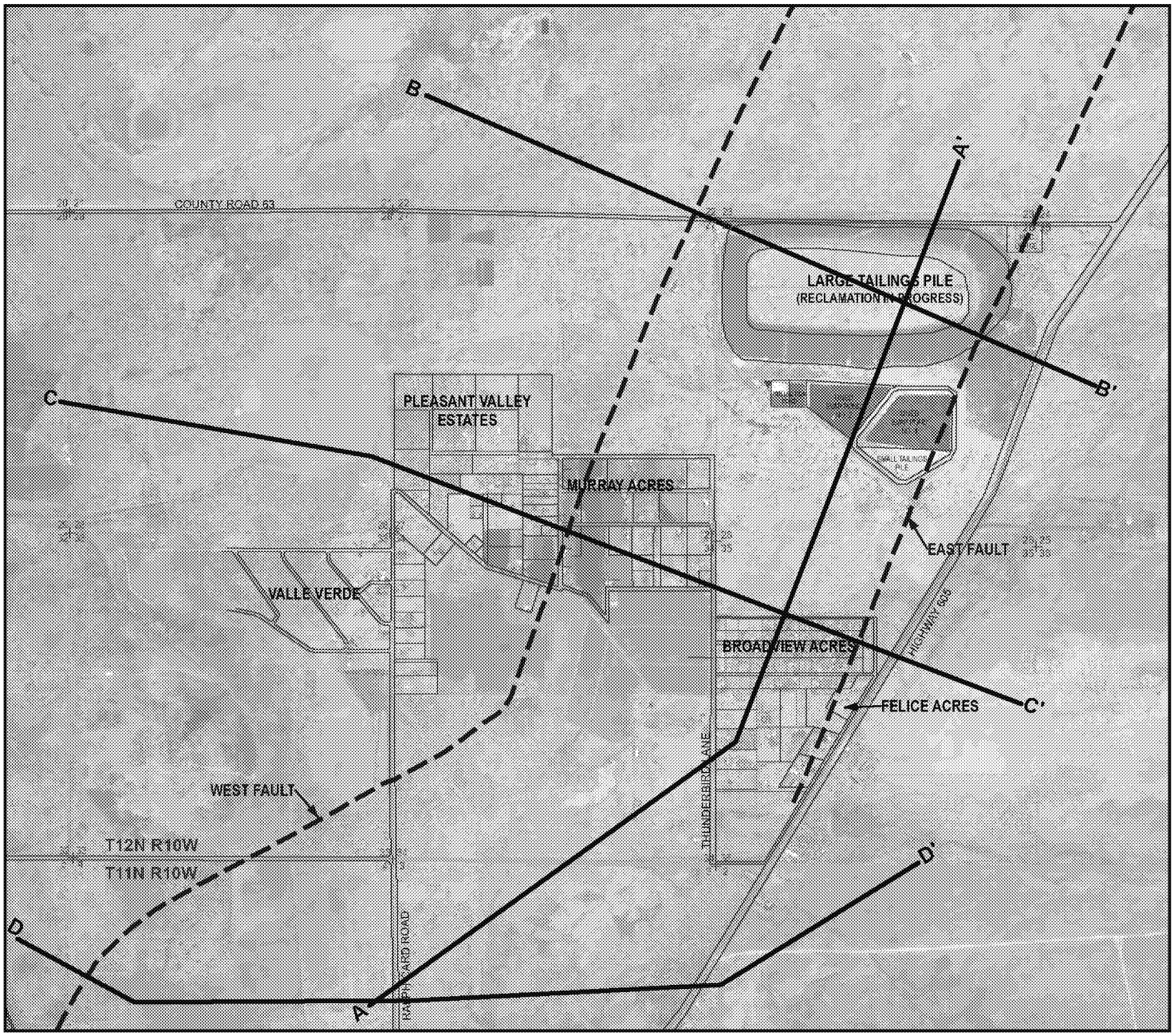
FIGURE 2

K:\AO000120_Grants\Illustrators\Figure 3.1-1 Bedrock Geology Map.ai @ 11/07/2011 PREPARED BY: JC

ED_004985_00011411-00073



LEGEND:

- Hydrogeologic Cross Section Line
- Fault

N

0 2,500 5,000

SCALE IN FEET

Source: NAIP 2009.

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

REGIONAL MAP

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FIGURE **3**

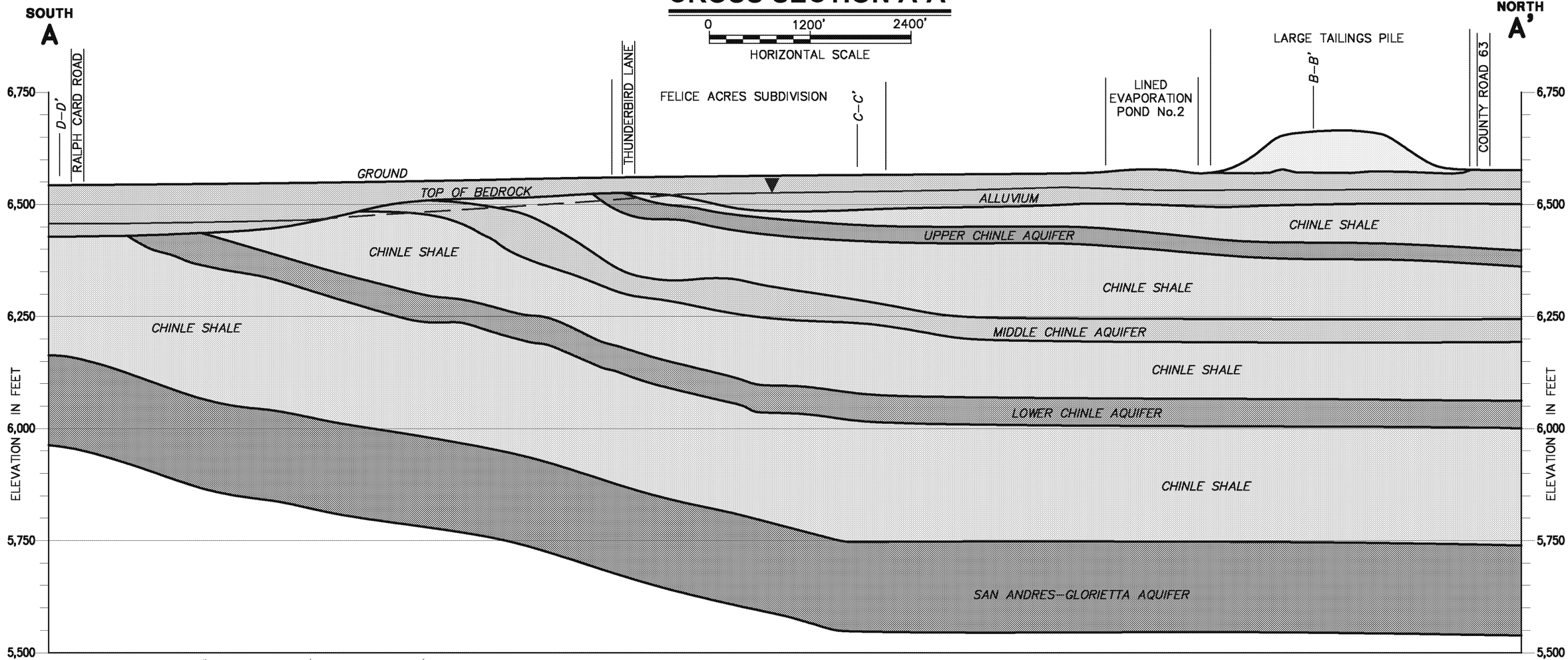
City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_3_Regional_Map.mxd 9/18/2018 11:33:31 AM

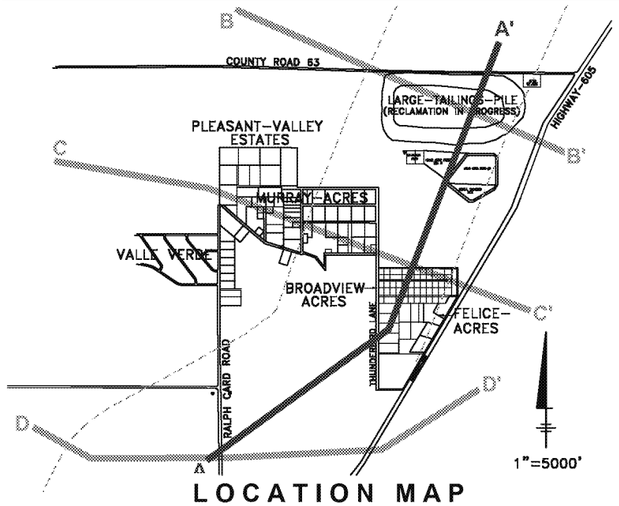
CROSS SECTION A-A'

SOUTH A — NORTH A'

0 1200' 2400'

HORIZONTAL SCALE





LOCATION MAP

NOTE:

1. THREE–DIMENSIONAL MODEL OUTPUT DEPICTED AT 5X VERTICAL EXAGGERATION.

LEGEND:

- LARGE TAILINGS PILE
- ALLUVIUM
- CHINLE SHALE
- UPPER CHINLE AQUIFER
- MIDDLE CHINLE AQUIFER
- LOWER CHINLE AQUIFER
- SAN ANDRES–GLORIETTA AQUIFER
- WATER TABLE

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

AQUIFERS IN THE HMC GRANTS MILL REGION

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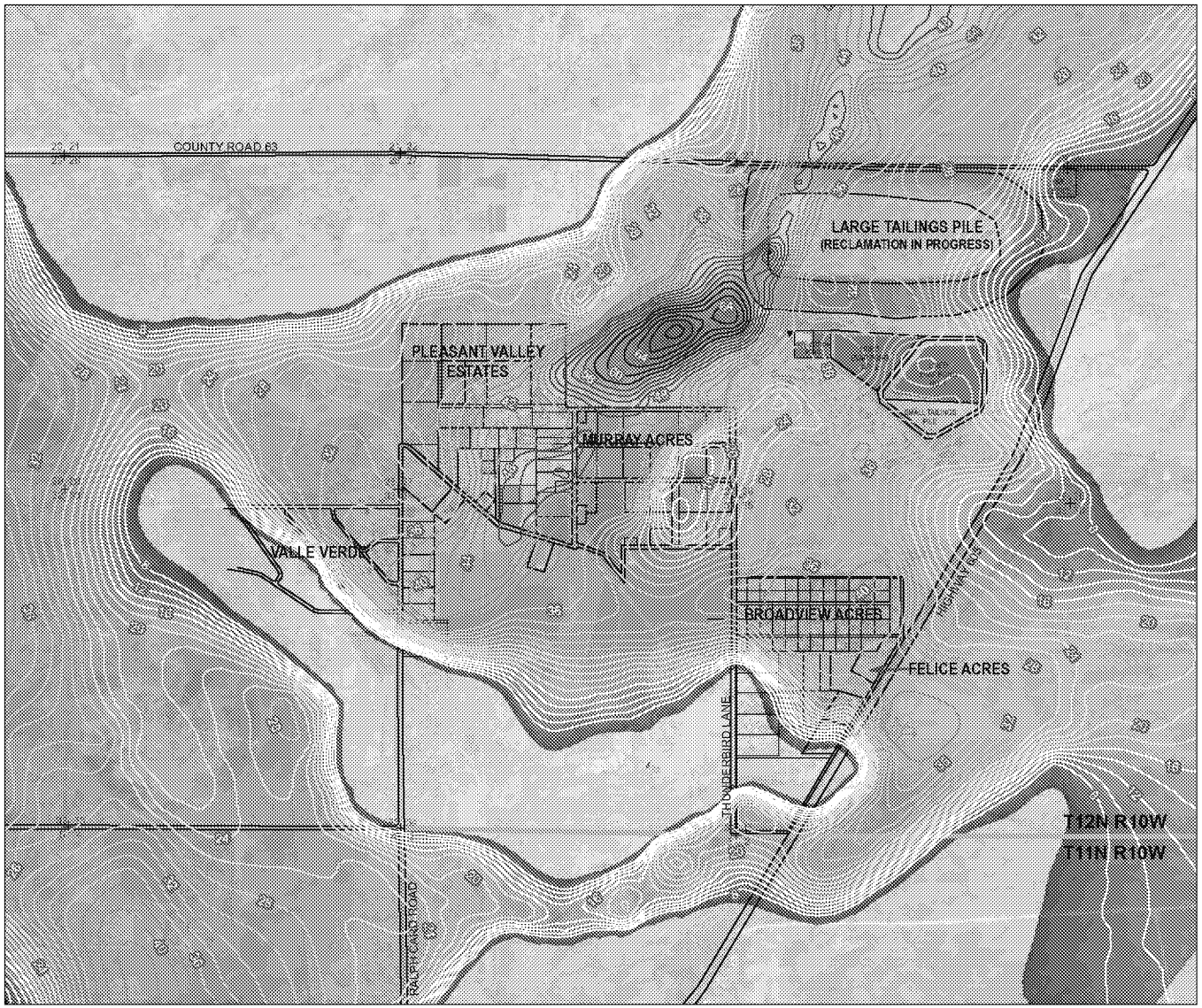
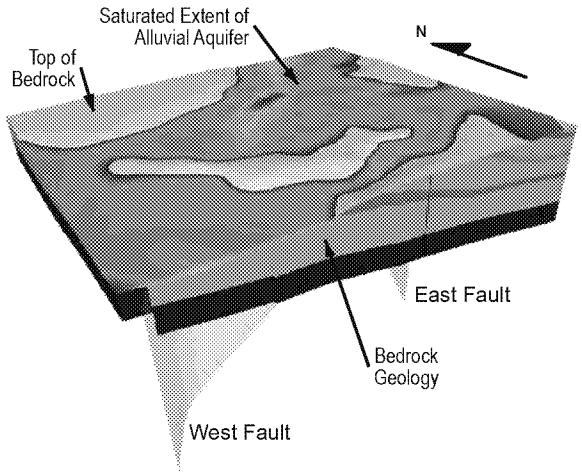
FIGURE 4



3D BEDROCK GEOLOGY AND SATURATED EXTENT OF ALLUVIAL AQUIFER - FACING NORTHEAST



LEGENDS:

Saturated Alluvial Thickness (feet)

69
60
52
43
34
26
17
9
0

Bedrock Hydrostratigraphy

- Chinle Shale
- Upper Chinle Aquifer
- Chinle Shale
- Middle Chinle Aquifer
- Chinle Shale
- Lower Chinle Aquifer
- Chinle Shale
- San Andres-Glorietta Aquifer

N

0 1,350 2,700 Feet

Source: NAIP 2009.

Thickness Contours in Feet

- 8 - 16
- 17 - 26
- 27 - 36
- 37 - 46
- 47 - 56
- 57 - 68

Note:
Displays composite extent of alluvial aquifer groundwater contamination that exceeds site standards for Selenium, Uranium, Molybdenum, Sulfate, Chloride, and Total Dissolved Solids.

Alluvial Aquifer Site Standards:
Selenium 0.32 mg/L
Uranium 0.16 mg/L
Molybdenum 0.10 mg/L
Sulfate 1,500 mg/L
Chloride 250 mg/L
Total Dissolved Solids 2,734 mg/L

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

ALLUVIAL SATURATION MAP

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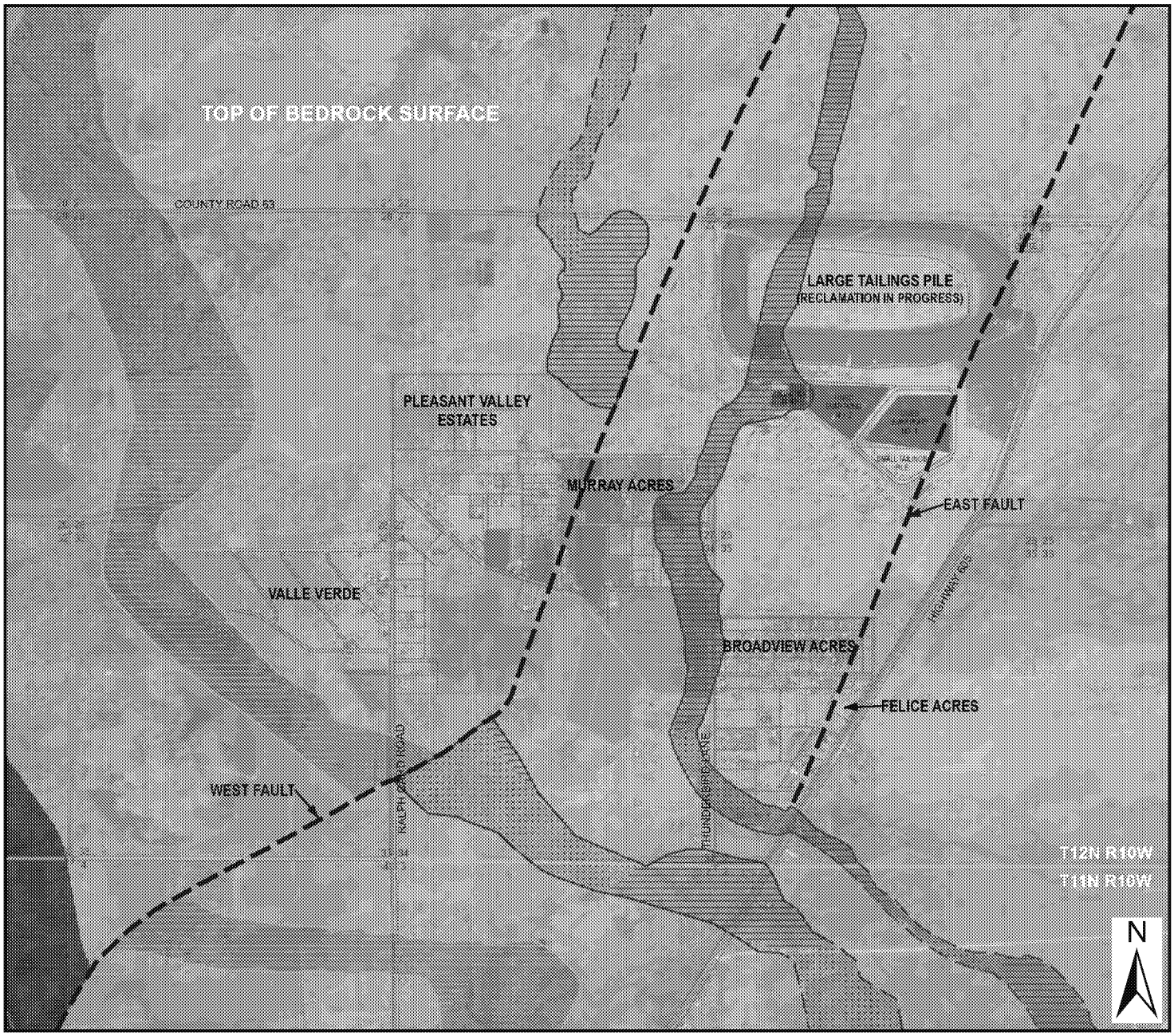
FIGURE 5

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GIS\Projects_ENVVA000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_5_Alluvial_Saturation_Map.mxd 9/19/2018 1:48:15 PM



LEGEND:

Fault

Subcrop* of Upper Chinle Alluvium Overlies Sandstone

Saturated Alluvium

Unsaturated Alluvium

Subcrop* of Lower Chinle Alluvium Overlies Secondary Porosity

Saturated Alluvium

Unsaturated Alluvium

Subcrop* of Middle Chinle Alluvium Overlies Sandstone

Saturated Alluvium

Unsaturated Alluvium

Subcrop* of San Andres-Glorietta Alluvium Overlies Limestone

Saturated Alluvium

* Subcrop boundary dashed where inferred.

0 2,500 5,000 Feet

Source: NAIP 2009.

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

MAP OF AQUIFER SUBCROPS

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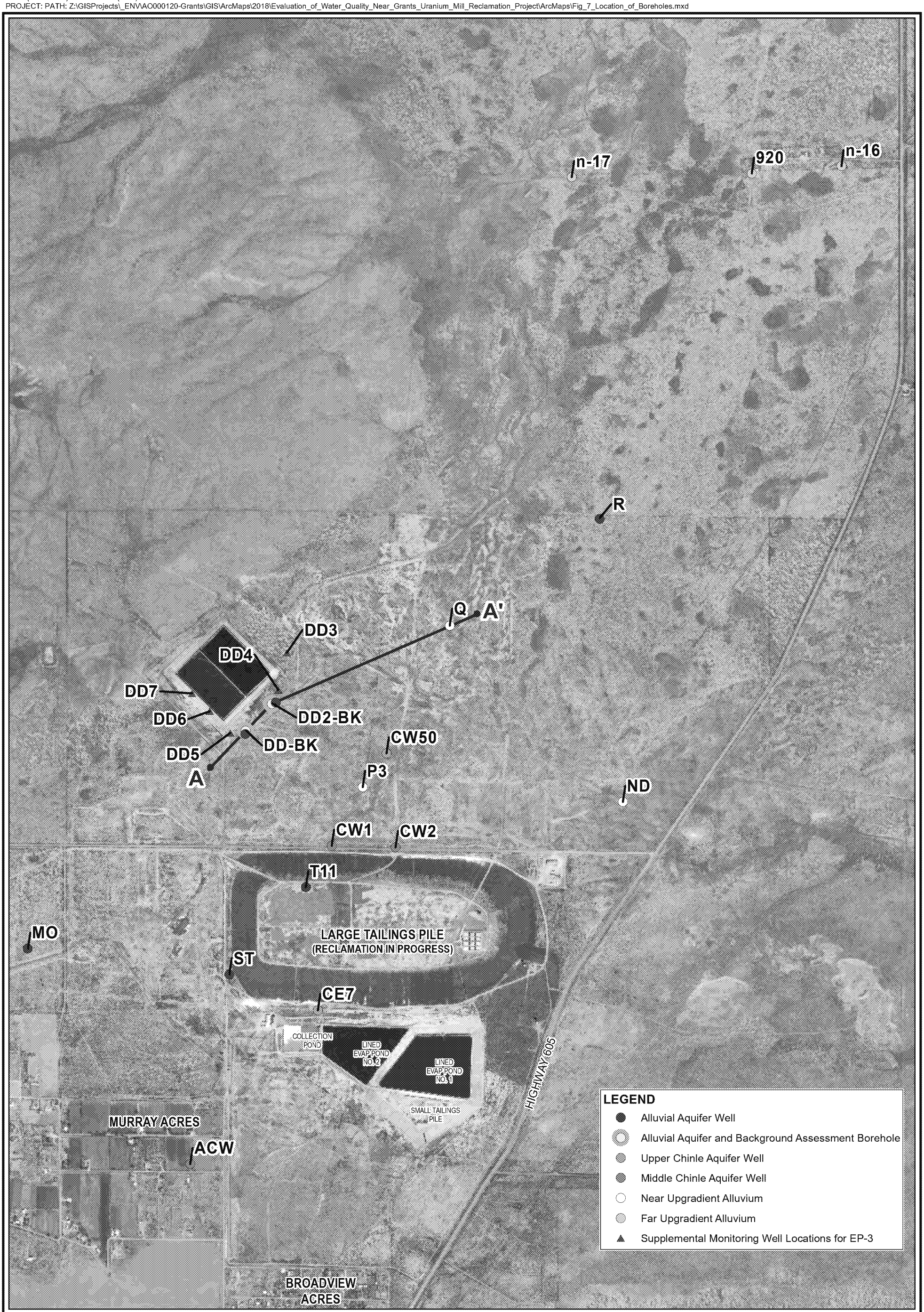
FIGURE 6

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_6_Map_of_Aquifer_Subcrops.mxd 9/18/2018 11:43:29 AM

CITY: (DENTECH) DIV/GROUP:(ENV) DB:KKELLEY LD: PIC: PM: TM: DATE: 9/20/2018
PROJECT: PATH: Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_7_Location_of_Boreholes.mxd



Legend

Map trace for A-A' cross-section depicted in Figure 2

N

0 1,400 2,800

SCALE IN FEET

Basemap features from:
Hydro-Engineering, LLC, 2011

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

LOCATION OF BOREHOLES

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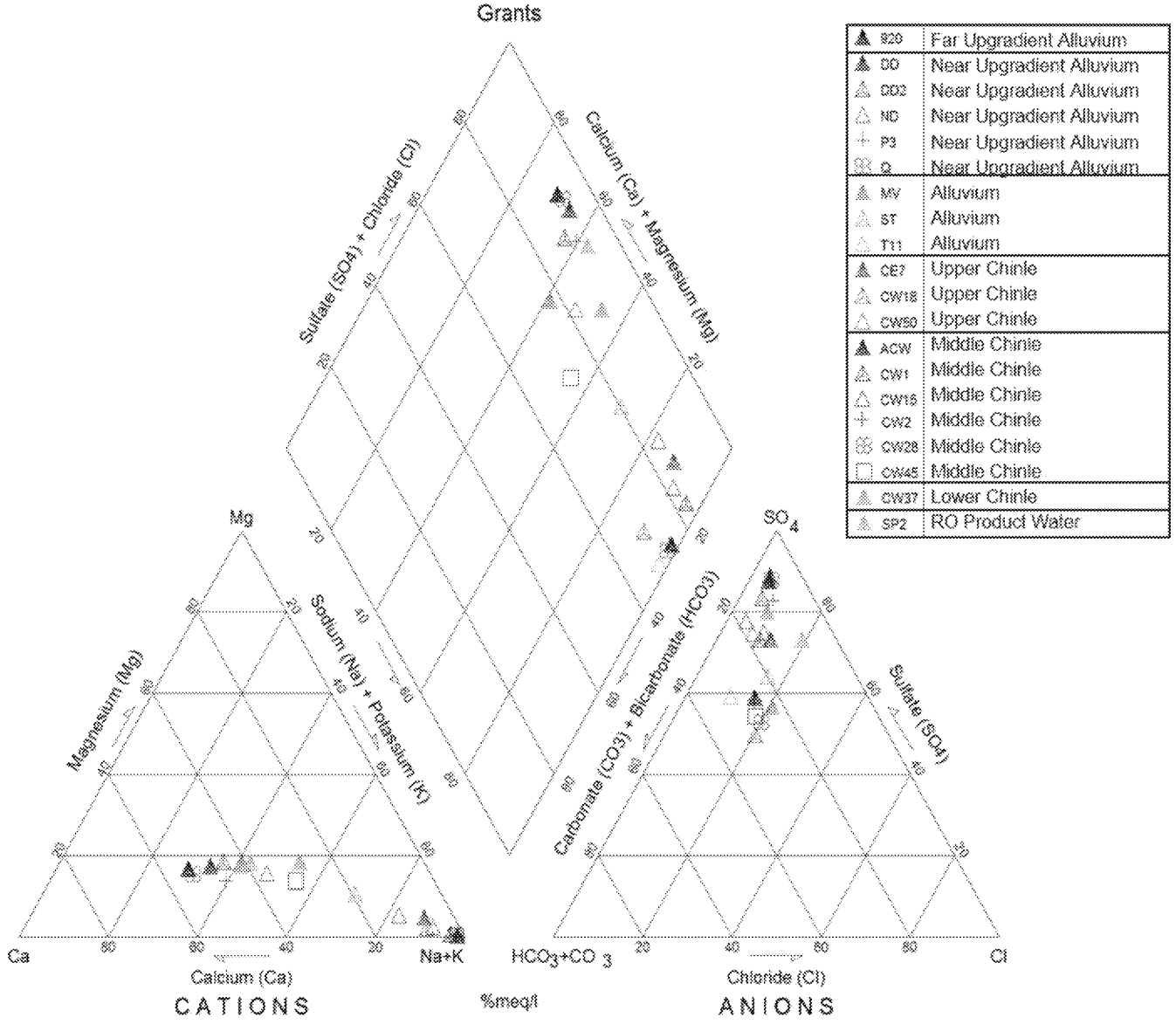
FIGURE 7

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



NOTE:

1. %meq/l - percent milliequivalents per liter

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

2016 SPLIT SAMPLING EVENT PIPER DIAGRAM

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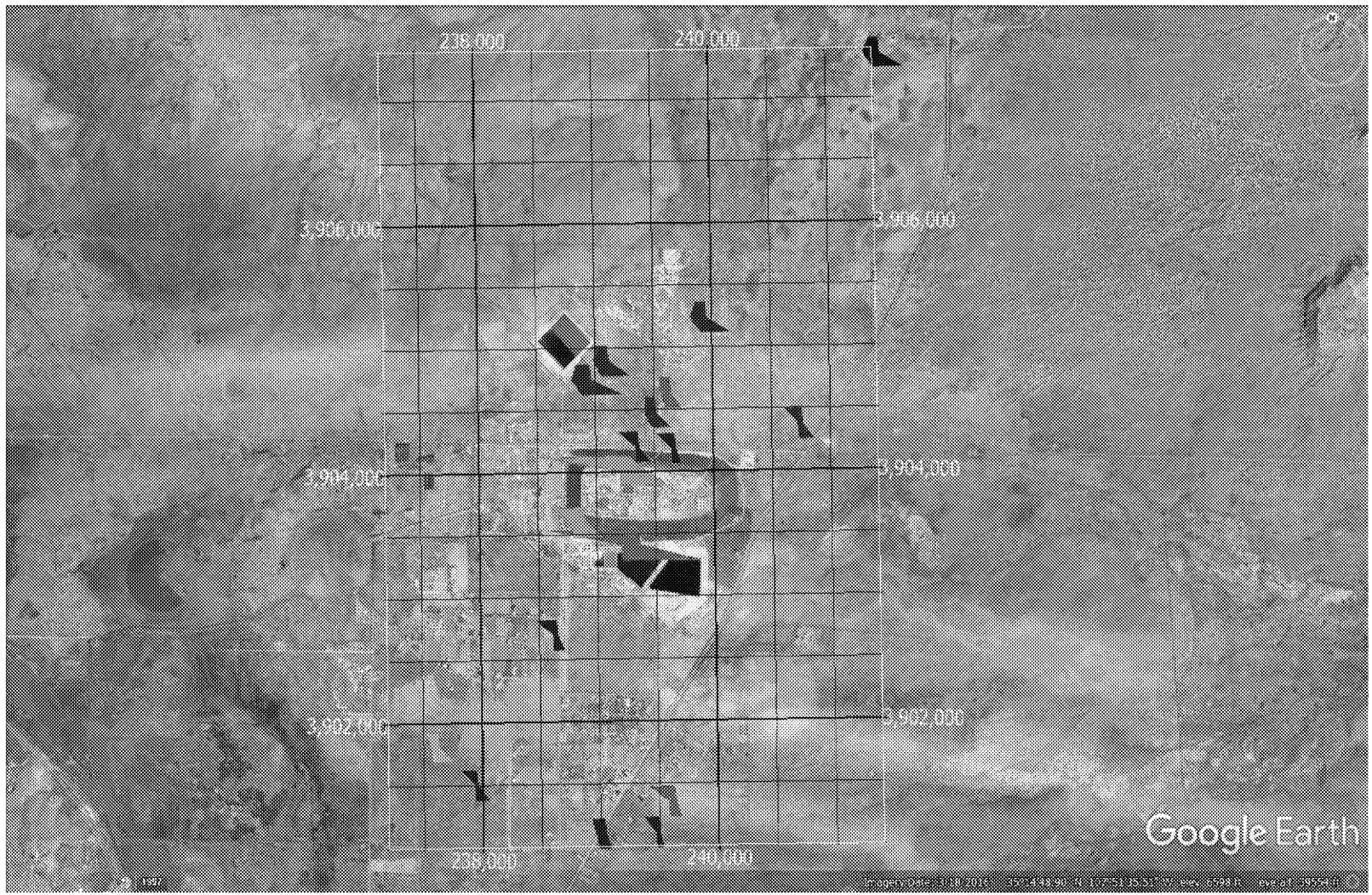
FIGURE **8**

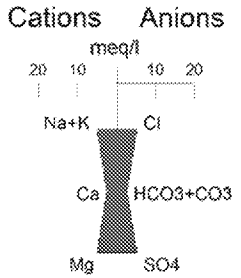
City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GIS\Projects_ENVVACO000120-Grants\GIS\ArcMaps\2016\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_8_2016_Split_Sampling_Event_Piper_Diagram.mxd 9/18/2018 11:51:09 AM

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_9_2016_Split_Sampling_Event_Stiff_Diagram_Map.mxd 9/18/2018 11:58:53 AM



NOTES:

1. Stiff Diagrams and Stiff map generated with RockWorks17.
2. Image downloaded from Google Earth on March 1, 2017.
3. meq/l - milliequivalents per liter
4. Ca - calcium
5. Cl - chloride
6. HCO3+CO3 - bicarbonate and carbonate
7. K - potassium
8. Mg - magnesium
9. SO4 - sulfate



EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

2016 SPLIT SAMPLING EVENT STIFF DIAGRAM MAP

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FIGURE
9

CITY: (DENTECH) DIV/GROUP:(ENV) DB:KKELLEY LD: PIC: PM: TM: DATE: 9/18/2018
PROJECT: PATH: Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_10_Split_Sampling_Event_Molybdenum_Magnitude_Map.mxd

920
0.001
Q
0.002
DD2
0.001
DD
0.001
CW50
0.002
P3
0.002
ND
0.005
COUNTY ROAD 63
CW1
0.028
CW2
0.01
T11
21.9
LARGE TAILINGS PILE
(RECLAMATION IN PROGRESS)
ST
6.21
MV
0.021
CE7
24.9
SP-2
0.011
605
COLLECTION POND
LINED EVAP. POND NO.2
LINED EVAP. POND NO.1
SMALL TAILINGS PILE
PLEASANT VALLEY ESTATES
MURRAY ACRES
ACW
0.003
VALLE VERDE
HIGHWAY 605
BROADVIEW ACRES
FELICE ACRES
CW37
0.137
CW15
0.004
CW18
0.133
CW45
0.003
CW28
0.023
RALPH CARD ROAD
THUNDERBIRD LANE
T12N R10W
T11N R10W

LEGEND

Total molybdenum concentrations (milligrams per liter)

- 0 to < 0.05
- 0.05 to < 0.1
- 0.1 to < 1
- > / = 1

- Far Upgradient Alluvium
- Near Upgradient Alluvium
- Alluvium
- Upper Chinle
- Middle Chinle
- Lower Chinle
- RO Product Water

NOTES:
1. red text = below detection limit; method detection limit shown

N

0 2,000 4,000

SCALE IN FEET

Basemap features from: Hydro-Engineering, LLC, 2011

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

2016 SPLIT SAMPLING EVENT MOLYBDENUM MAGNITUDE MAP

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FIGURE **10**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CITY: (DENTECH) DIV/GROUP:(ENV) DB:KKELLEY LD: PIC: PM: TM: DATE: 9/18/2018
PROJECT: PATH: Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_11_Split_Sampling_Event_Selenium_Magnitude_Map.mxd

920
0.27
Q
0.4
DD2
0.001
DD
0.11
CW50
0.001
P3
0.254
ND
0.115
COUNTY ROAD 63
CW1
0.044
CW2
0.04
T11
0.151
LARGE TAILINGS PILE
(RECLAMATION IN PROGRESS)
ST
0.2
CE7
0.87
MV
0.032
SP-2
0.008
605
COLLECTION POND
LINED EVAP. POND NO.2
LINED EVAP. POND NO.1
SMALL TAILINGS PILE
PLEASANT VALLEY ESTATES
MURRAY ACRES
ACW
0.059
VALLE VERDE
HIGHWAY 605
BROADVIEW ACRES
CW37
0.065
FELICE ACRES
CW15
0.015
CW18
0.022
CW45
0.035
CW28
0.047
RALPH CARD ROAD
THUNDERBIRD LANE
T12N R10W
T11N R10W

LEGEND

Total selenium concentrations (milligrams per liter)

- 0 to < 0.08
- 0.08 to < 0.16
- 0.16 to < 0.32
- >/ = 0.32

- Far Upgradient Alluvium
- Near Upgradient Alluvium
- Alluvium
- Upper Chinle
- Middle Chinle
- Lower Chinle
- RO Product Water

NOTE:
1. red text = below detection limit; method detection limit shown

N

0 2,000 4,000

SCALE IN FEET

Basemap features from: Hydro-Engineering, LLC, 2011

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

2016 SPLIT SAMPLING EVENT SELENIUM MAGNITUDE MAP

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FIGURE 11

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

Total uranium concentrations (milligrams per liter)

- 0 to < 0.08
- 0.08 to < 0.16
- 0.16 to < 1
- 1 to < 10
- >/ = 10

- Far Upgradient Alluvium
- Near Upgradient Alluvium
- Alluvium
- Upper Chinle
- Middle Chinle
- Lower Chinle
- RO Product Water

N

0 2,000 4,000

SCALE IN FEET

Basemap features from: Hydro-Engineering, LLC, 2011

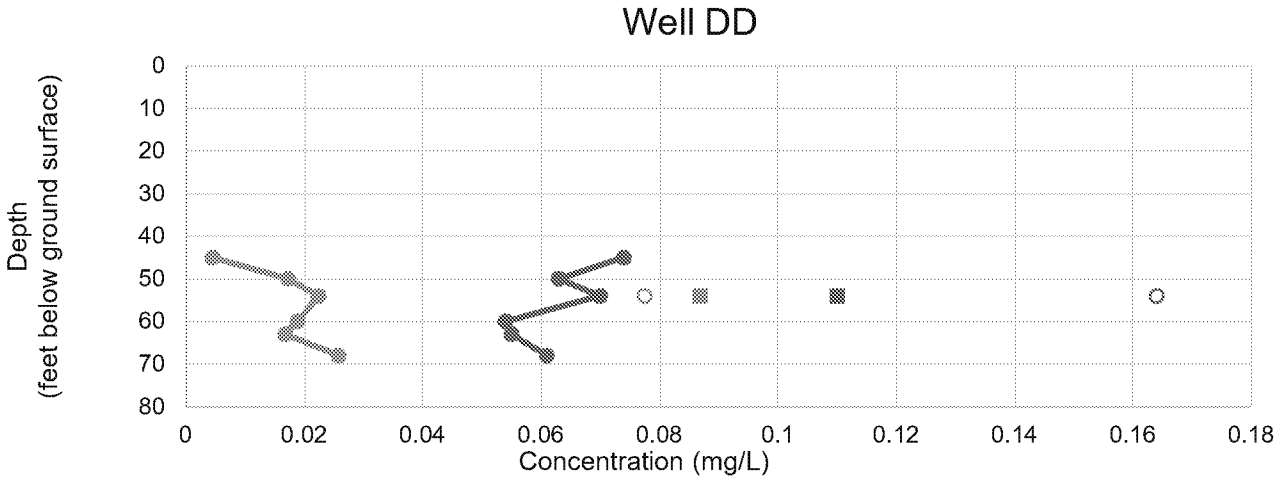
EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

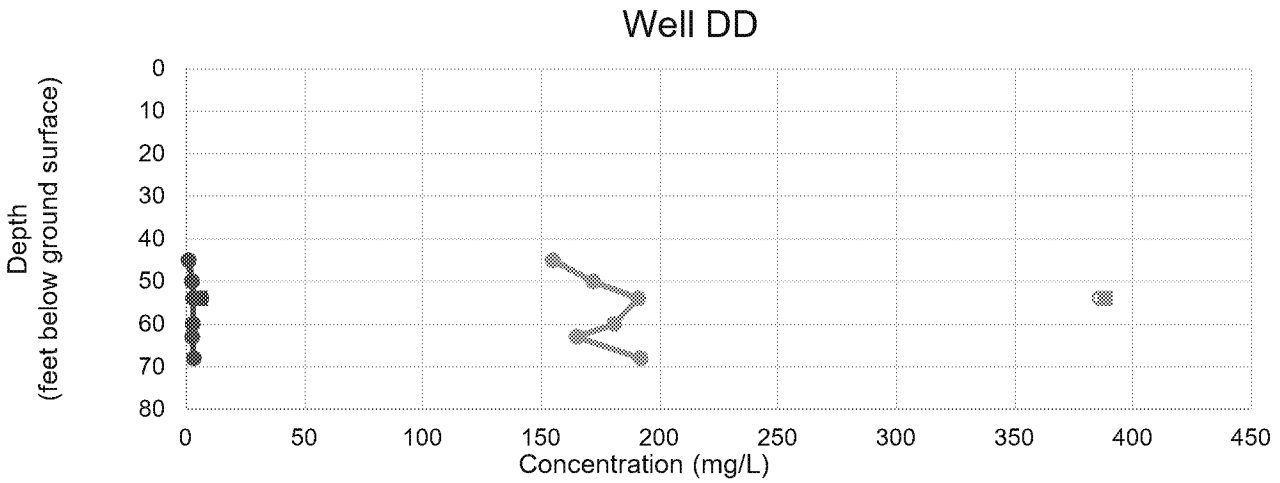
2016 SPLIT SAMPLING EVENT URANIUM MAGNITUDE MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE **12**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





NOTES:

1. K - potassium
2. mg/L - milligram per liter
3. Na - sodium
4. Se - selenium
5. U - uranium

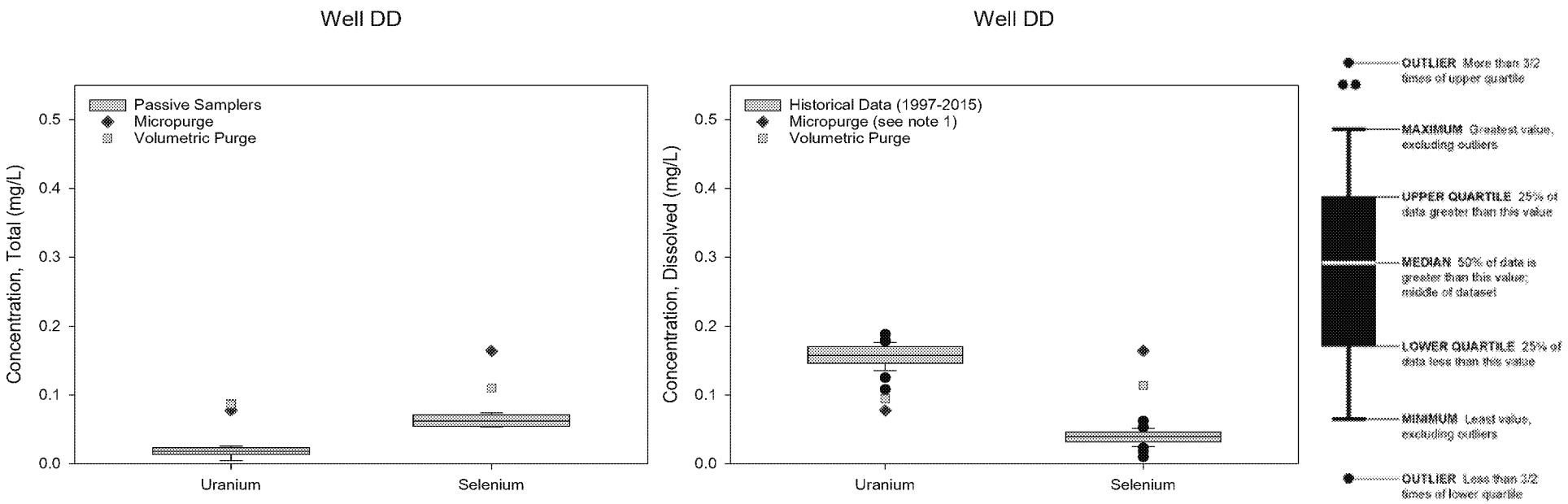
EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

2016 SPLIT SAMPLING EVENT CONCENTRATION VARIABILITY BY SAMPLING METHOD - LINE PLOT

ARCADIS Design & Consultancy for natural and built assets

FIGURE 13

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GIS\Projects_ENVVAC0000120-Grants\GIS\ArcMaps\2016\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_13_2016_Split_Sampling_Event_Concentration_Variability_by_Sampling_Method_Line_Plot.mxd 9/19/2016 12:58:26 PM



NOTES:

1. Micropurge concentrations are total metals, not dissolved.
2. mg/L - milligram per liter
3. Box plot legend from https://flowingdata.com/2008/02/15/how-to-read-and-use-a-box-and-whisker-plot/

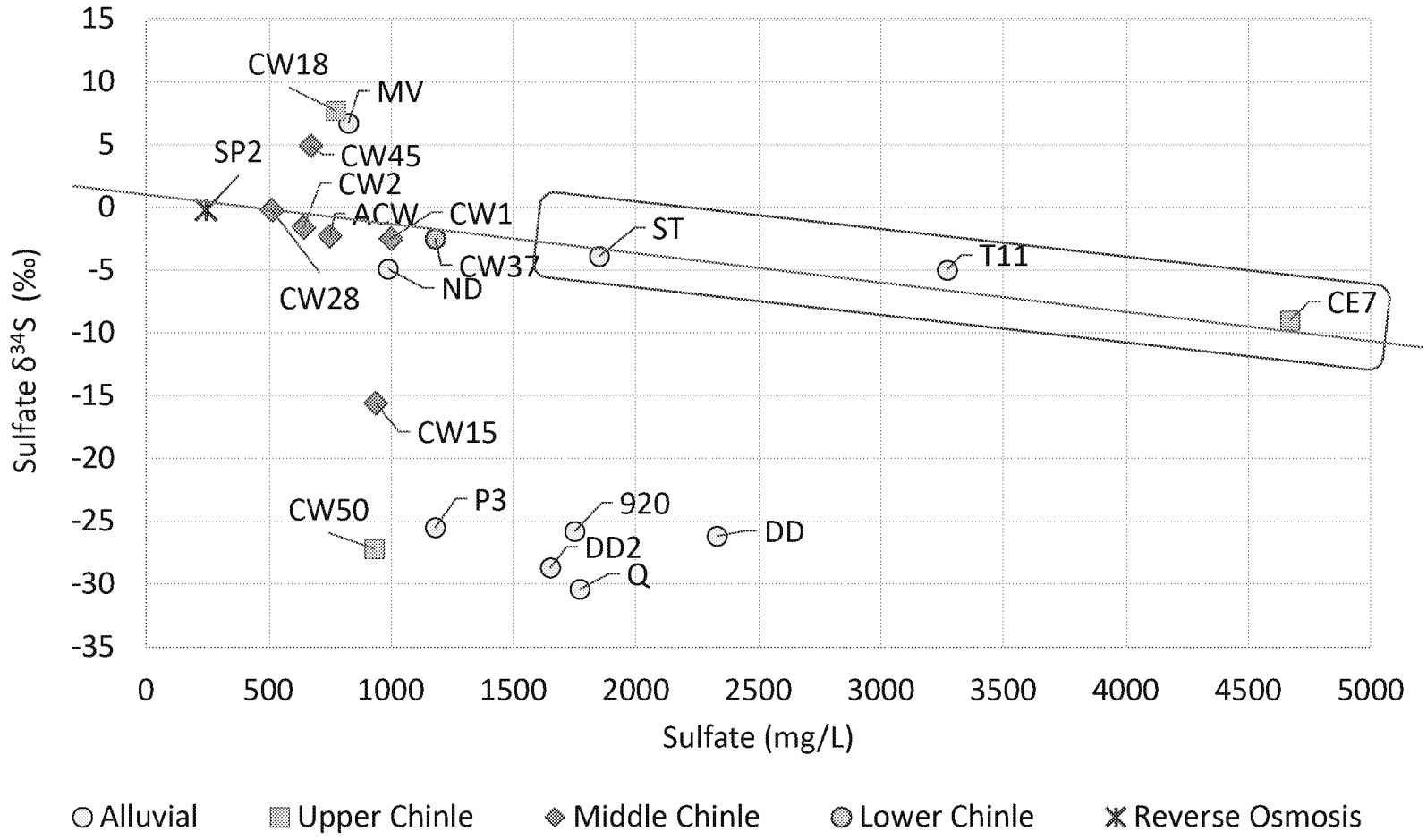
EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

2016 SPLIT SAMPLING EVENT CONCENTRATION VARIABILITY BY SAMPLING METHOD - BOX PLOT

ARCADIS Design & Consultancy for natural and built assets

FIGURE
14

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_15_2016_SSE_Sulfur_Stable_Isotope_Results.mxd 9/19/2018 1:51:06 PM



NOTES:
1. ‰ - per mille
2. mg/L - milligram per liter

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

SULFUR STABLE ISOTOPE RESULTS FOR 2016 SSE

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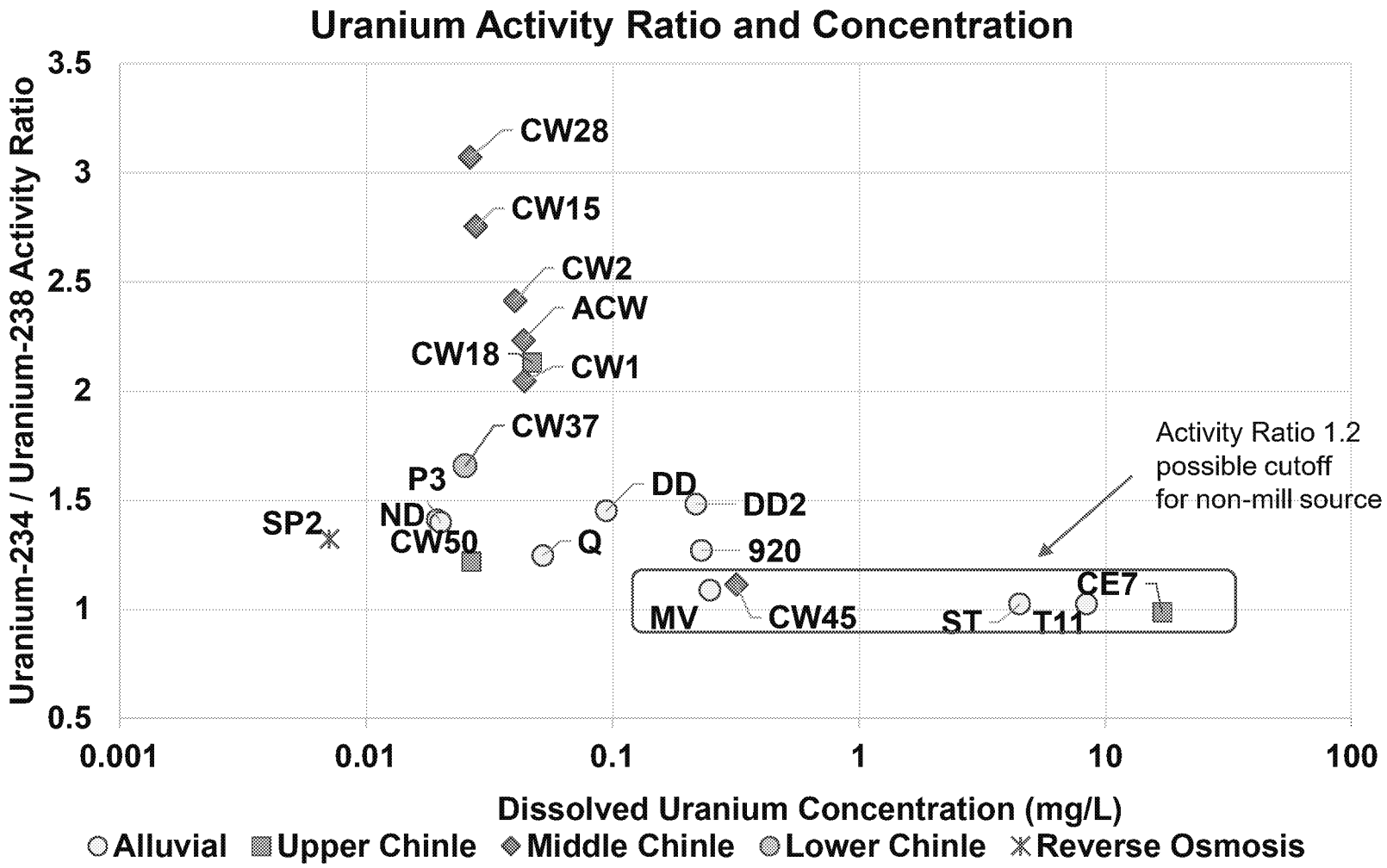
FIGURE
15

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_16_2016_SSE_Uranium_Activity_Ratios.mxd 9/18/2018 1:10:19 PM



NOTES:
1. mg/L - milligram per liter

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

**URANIUM ACTIVITY RATIOS
FOR 2016 SSE**

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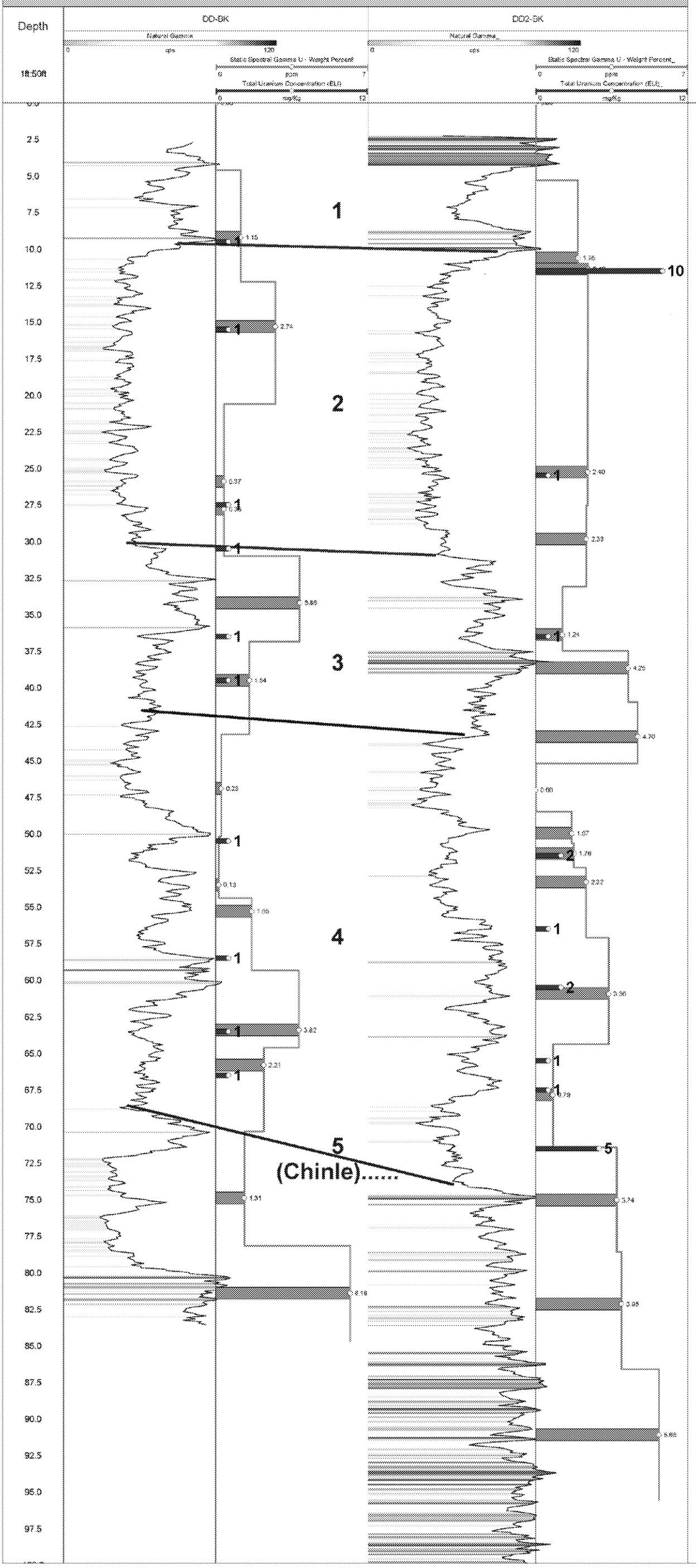
FIGURE
16

COMPARISON BETWEEN DD-BK AND DD2-BK NATURAL GAMMA LOGS



EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

**2018 SOIL INVESTIGATION
GEOPHYSICS RESULTS**

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FIGURE
17

A
Southeast

A'
Northeast

DD-BK

DD2-BK

West Fault

Q
(Projected 903')

SAND & CLAY

SAND & CLAY

GRAVEL

GRAVEL

SHALE BEDROCK

85

100

100.5

West Fault

6600
6590
6580
6570
6560
6550
6540
6530
6520
6510
6500
6490
6480
6470

ELEVATION - FEET ABOVE MEAN SEA LEVEL

ELEVATION - FEET ABOVE MEAN SEA LEVEL

SP/SW - SAND

SM - SILTY SAND

SC - CLAYEY SAND

CH/CL - CLAY

SHALE / BEDROCK

GRAVEL

LITHOLOGY BOUNDARIES DASHED WHERE INFERRED

DD-BK BORING IDENTIFICATION

GROUND SURFACE

105 BOTTOM OF BORING WELL TOTAL DEPTH

FAULT AND SLIP DIRECTION

VERTICAL EXAGGERATION = 1:25

0 20' 40'

Vertical Scale: 1 in. = 20 ft.

0 500' 1000'

Horizontal Scale: 1 in. = 1000 ft

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

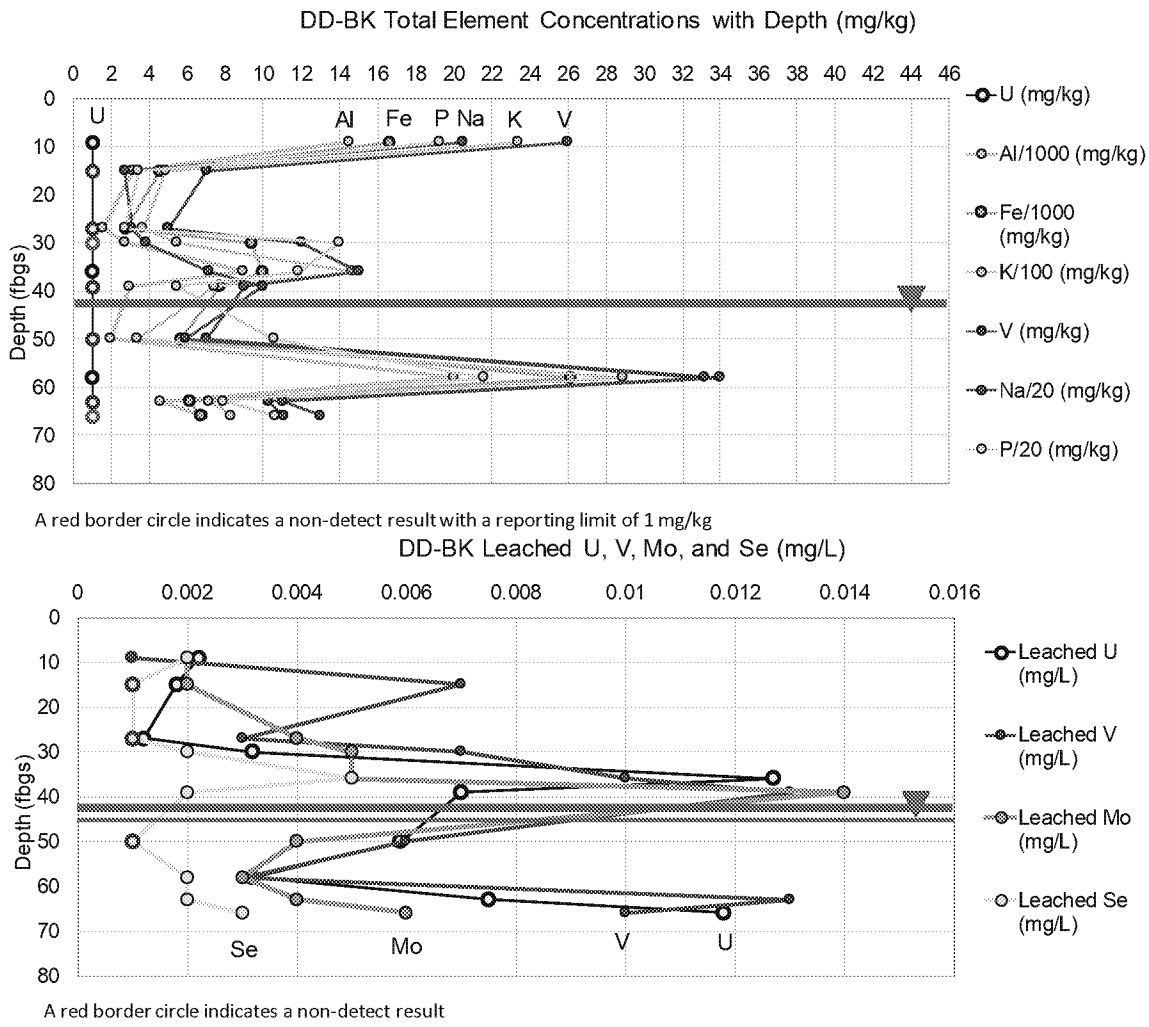
NEW GEOLOGIC CROSS SECTION

ARCADIS

FIGURE
18

CITY:(Reqd) DIVISION:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
E:\SHAWN_XSECTIONS\Figure18_NewGeologicCrossSection.dwg LAYOUT: SECTION A-A' SAVED: 8/2/2018 5:19 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ACAD.CTB PLOTTED: 8/2/2018 5:19 PM BY: PETERSON, KEITH

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_19_Trace_Metals_in_Soil_at_DD_BK.mxd 9/19/2018 2:06:03 PM



NOTES:

1. Al = aluminum
2. fbgs = feet below ground surface
3. Fe = iron
4. K = potassium
5. mg/kg = milligrams per kilogram
6. mg/L = milligrams per liter
7. Mo = molybdenum
8. Na = sodium
9. P = phosphorus
10. Se = selenium
11. U = uranium
12. V = vanadium

Top of groundwater table

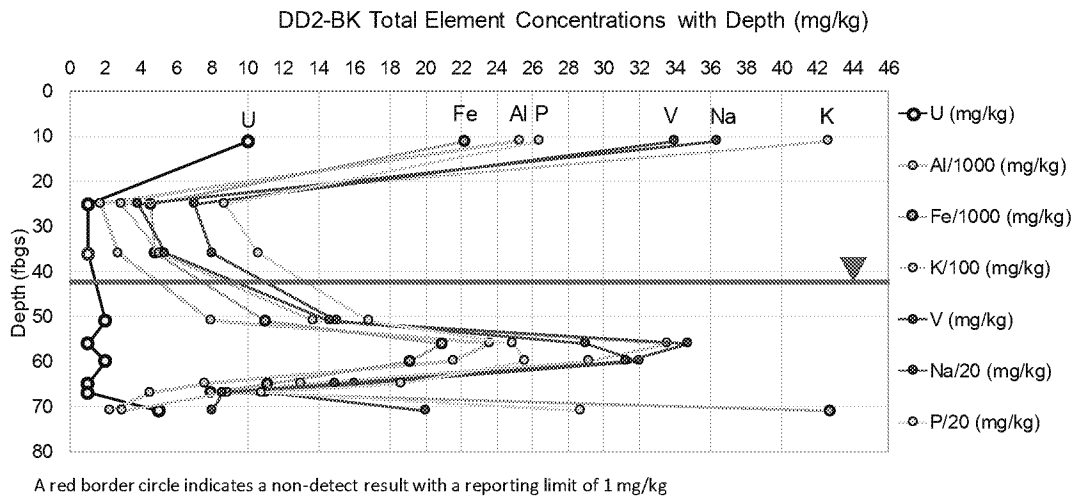
EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

TRACE METALS IN SOIL AT DD-BK

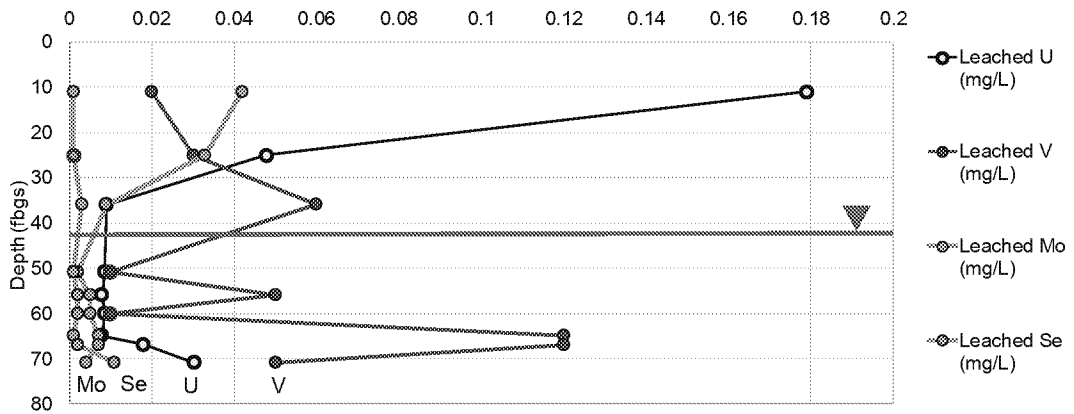
ARCADIS Design & Consultancy for natural and built assets

FIGURE 19

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_20_Trace_Metals_in_Soil_at_DD2_BK.mxd 9/19/2018 2:10:50 PM



A red border circle indicates a non-detect result with a reporting limit of 1 mg/kg



A red border circle indicates a non-detect result

NOTES:

1. Al = aluminum
2. fbgs = feet below ground surface
3. Fe = iron
4. K = potassium
5. mg/kg = milligrams per kilogram
6. mg/L = milligrams per liter
7. Mo = molybdenum
8. Na = sodium
9. P = phosphorus
10. Se = selenium
11. U = uranium
12. V = vanadium

Top of groundwater table

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

TRACE METALS IN SOIL AT DD2-BK

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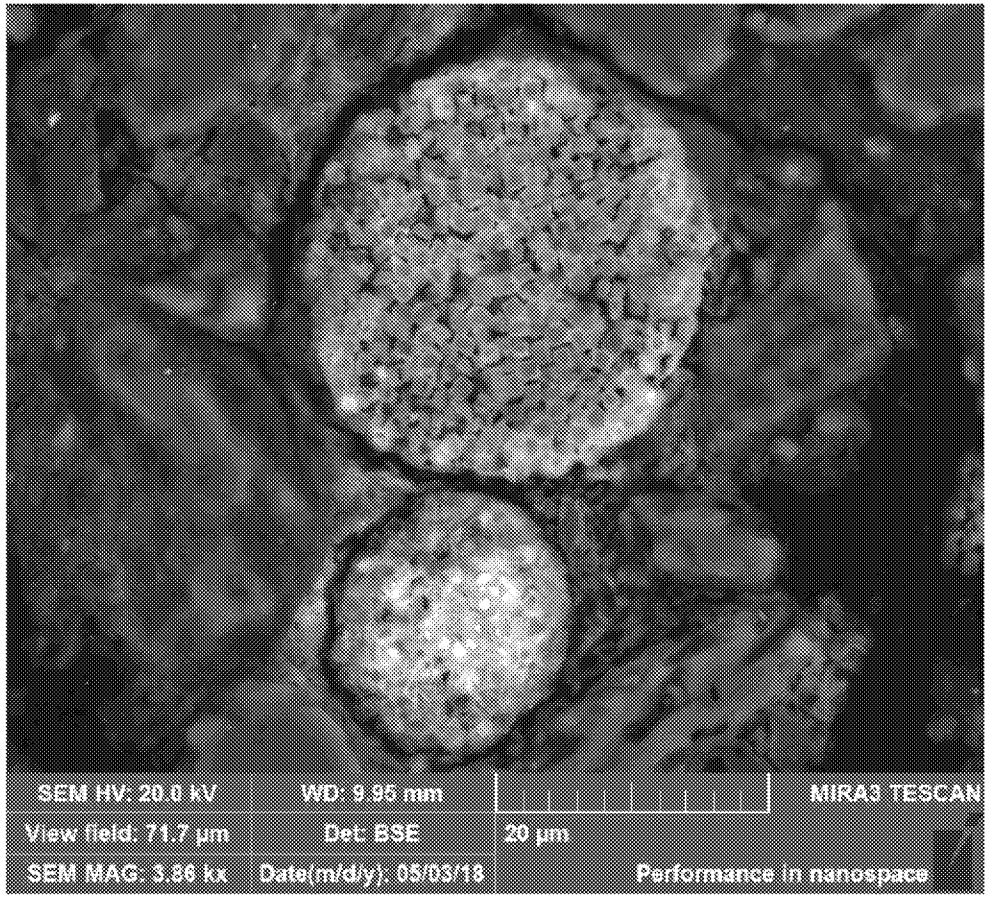
FIGURE 20

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_21_Pyrite_Framboids_in_Soil.mxd 9/18/2018 1:20:48 PM



Client Sample No.: **DD2-BK-51-52-012318**

Backscatter image of iron oxide pseudomorphs after pyrite framboids sit in a matrix of clay with quartz/feldspar grains. The smaller pseudomorph contains bright relict pyrite – 3,860X.

NOTES:
1. µm = microns
2. BSE = backscatter electron detector
3. HV = high voltage
4. kx = thousand times magnification
5. kV = kilovolts
6. m/d/y = month/day/year
7. mm = millimeters
8. WD = working distance
9. X = times magnified

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

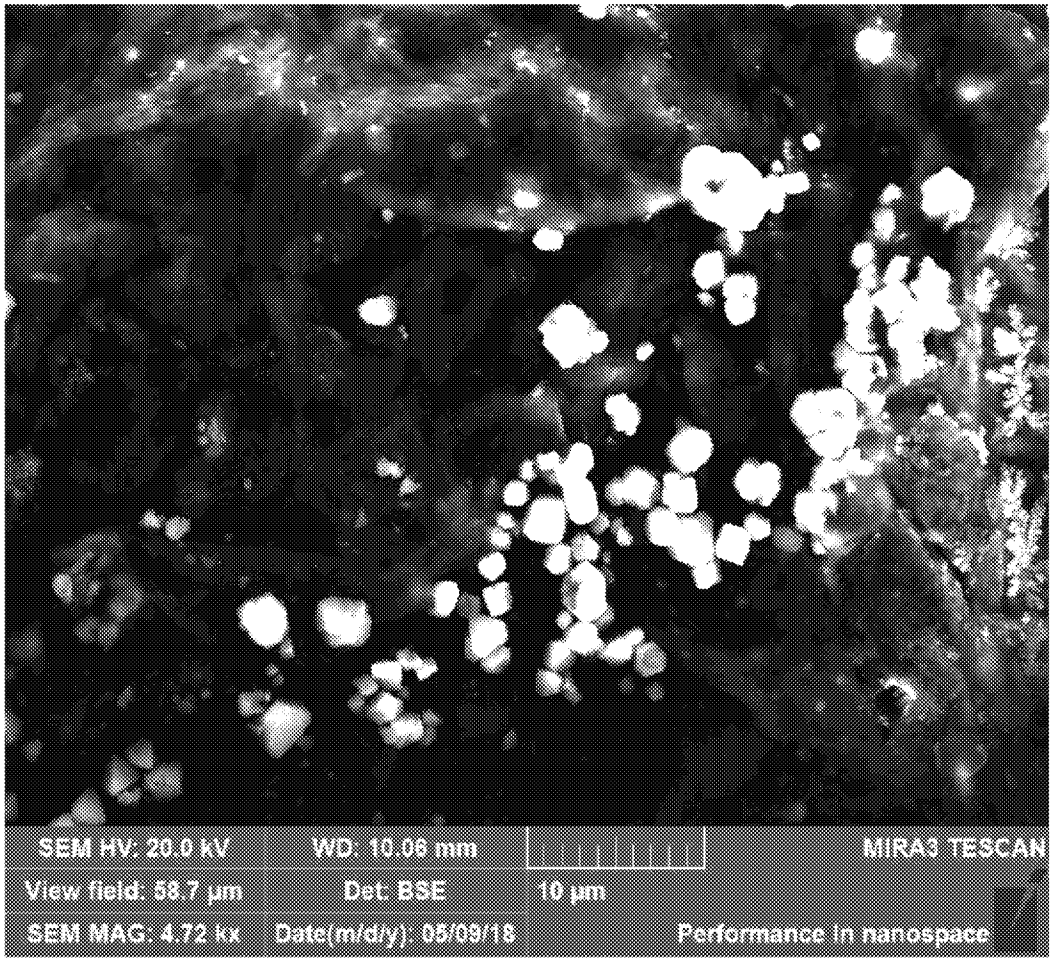
PYRITE FRAMBOIDS IN SOIL

ARCADIS Design & Consultancy for natural and built assets

FIGURE
21

ED_004985_00011411-00092

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_22_Halite_Crystals_in_a_Cavity_in_Soil.mxd 9/18/2018 1:21:49 PM



Client Sample No.: **DD2-BK-60-61-012618**

Backscatter image of a clay pocket filled with cubes of halite – 4,720X.

NOTES:

1. µm = microns
2. BSE = backscatter electron detector
3. HV = high voltage
4. kx = thousand times magnification
5. kV = kilovolts
6. m/d/y = month/day/year
7. mm = millimeters
8. WD = working distance
9. X = times magnified

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

HALITE CRYSTALS IN A CAVITY IN SOIL

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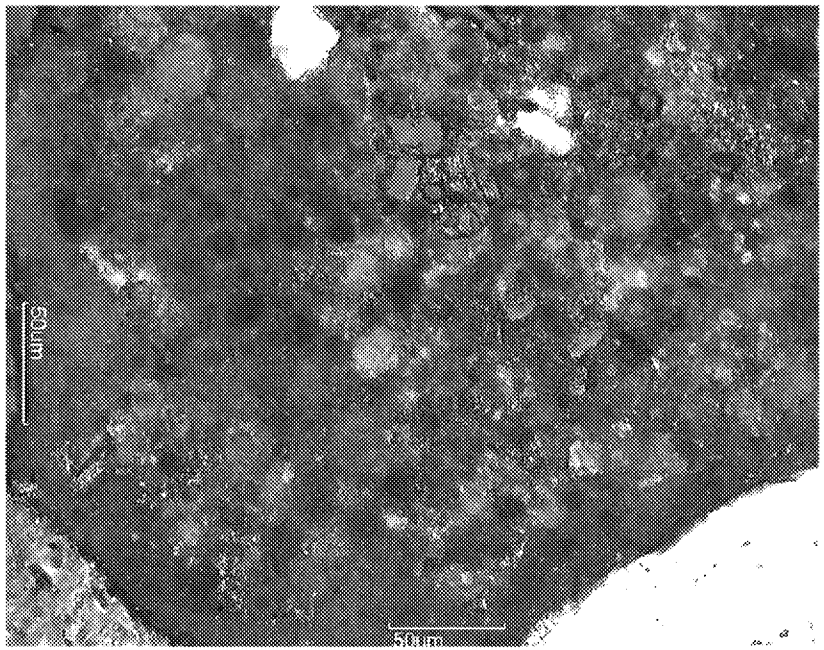
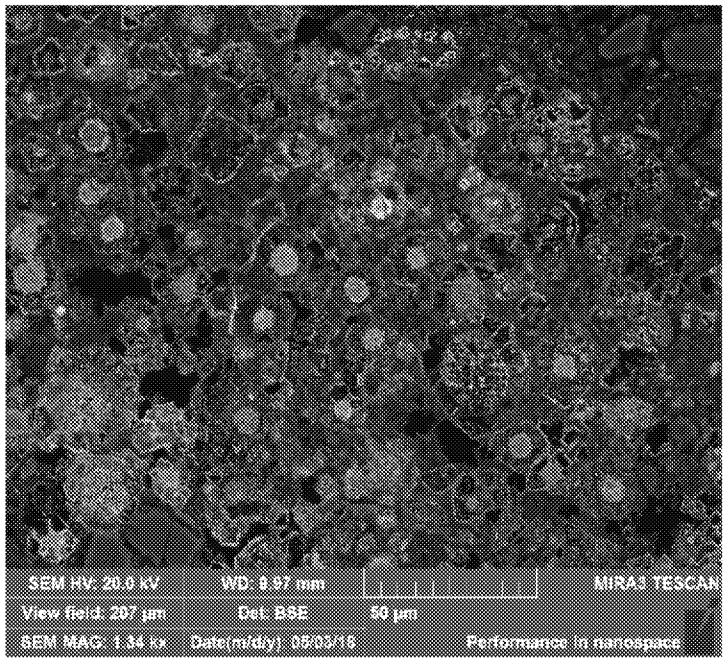
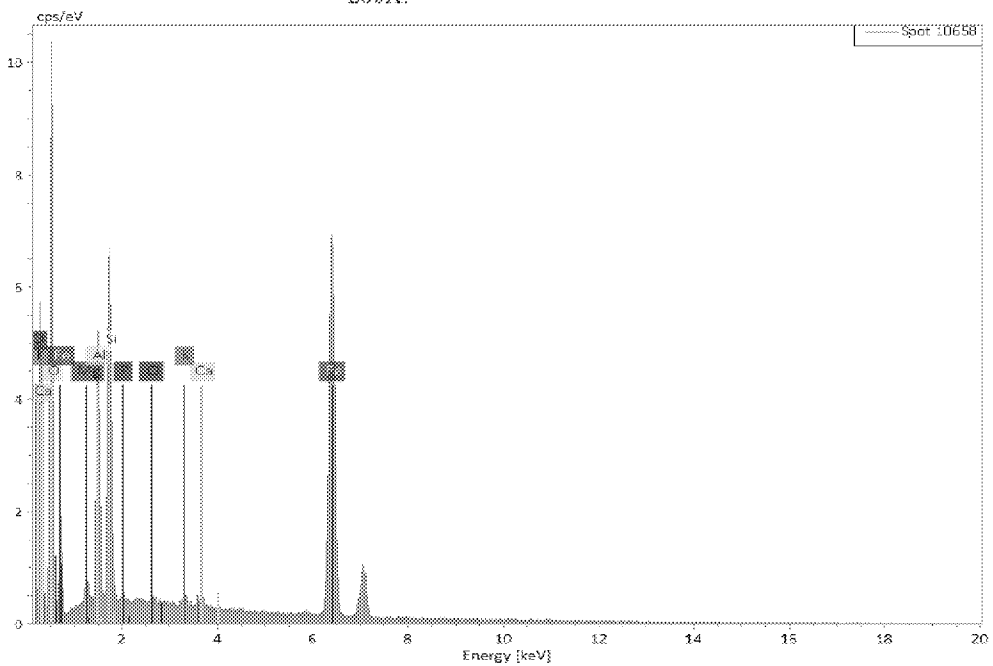
FIGURE
22



Client Sample No.: **DD2-BK-25-26-012218**
Iron oxide pseudomorphs after pyrite and pyrite framboids. Reflected light crossed Nichols – 200X.



Client Sample No.: **DD2-BK-25-26-012218**
Backscatter image of iron oxide pseudomorphs after pyrite cubes and framboids – 1,340X.



NOTES:

1. µm = microns
2. BSE = backscatter electron detector
3. cps/eV = count per second per electron volt
4. HV = high voltage
5. keV = kiloelectronvolt
6. kx = thousand times magnification
7. kV = kilovolts
8. m/d/y = month/day/year
9. mm = millimeters
10. WD = working distance
11. X = times magnified

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

MASSIVE COLLECTION OF IRON OXIDE PSEUDOMORPHS OF PYRITE FRAMBOIDS IN SOIL

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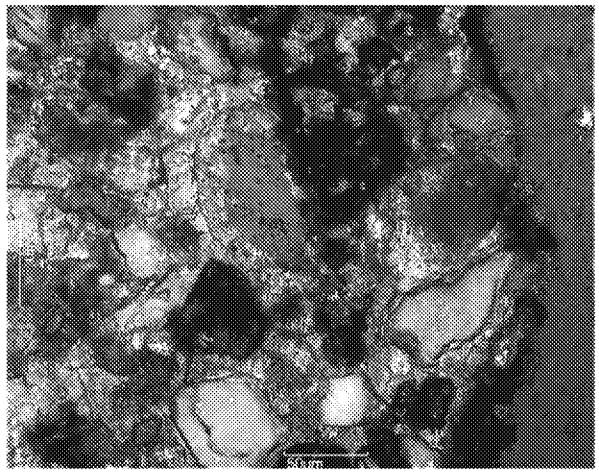
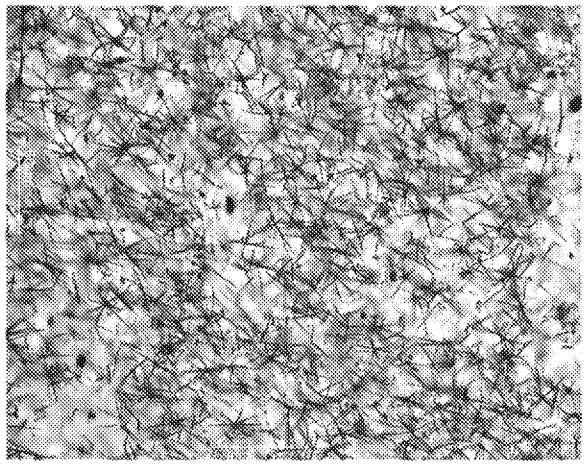
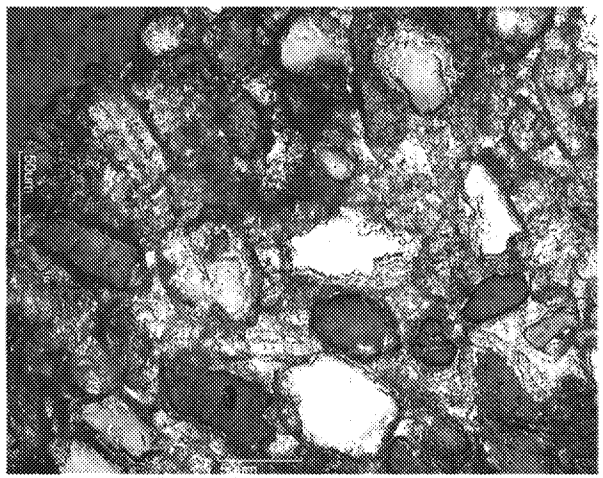
FIGURE
23



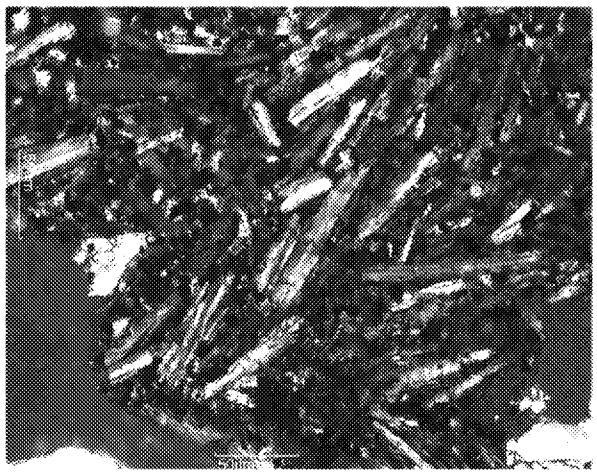
Client Sample No.: **DD2-BK-25-26-012218**
Calcite and iron oxide cement quartz/feldspar grains. Reflected light crossed Nichols – 200X



Client Sample No. **DD2-BK-25-26-012218**
Isotropic volcanic glass riddled with unknown opaque, acicular crystallites. Polarized light – 250X.



Client Sample No. **DD2-BK-71-72-012318**
Calcite and iron oxide cement quartz/feldspar grains. Reflected light crossed Nichols – 200X.



Client Sample No.: **DD2-BK-71-72-012318**
Fragment of basalt showing lath shaped plagioclase. Polarized light – 200X.

NOTES:
1. X = times magnified

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

MINERALOGICAL CONSORTIA SHOWING QUARTZ, FELDSPAR, AND OTHER IGNEOUS MINERALOGY

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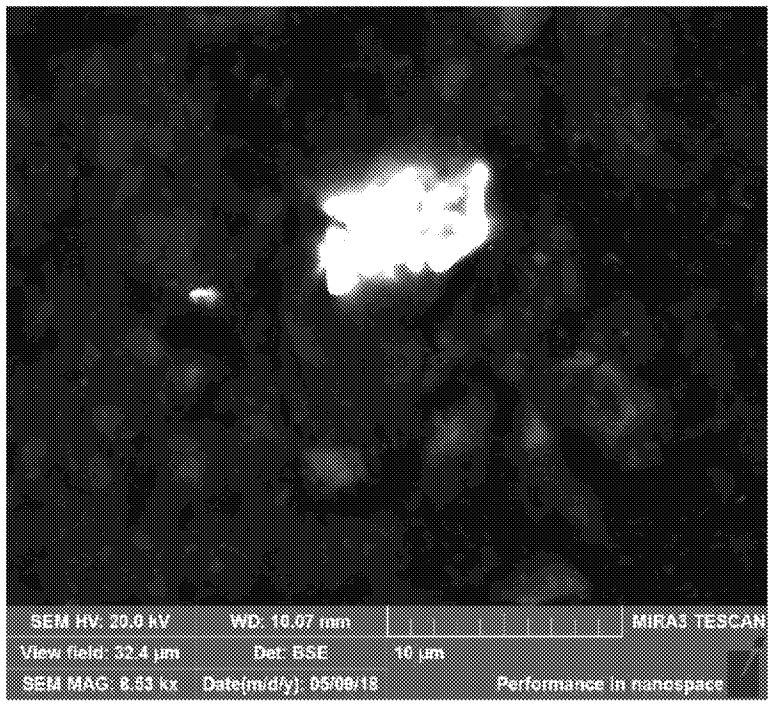
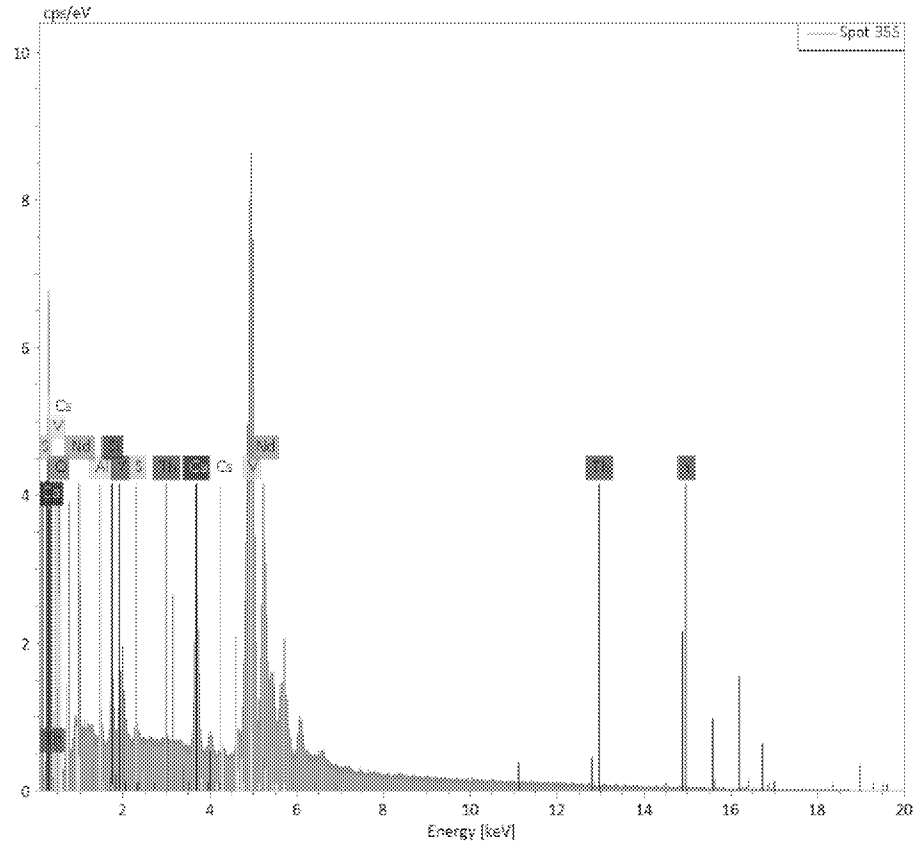
FIGURE
24

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Evaluation_of_Water_Quality_Near_Grants_Uranium_Mill_Reclamation_Project\ArcMaps\Fig_25_Vanadium_Minerals_in_Clay.mxd 9/18/2018 1:23:59 PM



Client Sample No.: **DD2-BK-60-61-012618**

Backscatter image showing a bright grain composed of REE's with vanadium included in a clay mass – 8530X.



NOTES:

1. µm = microns
2. BSE = backscatter electron detector
3. cps/eV = count per second per electron volt
4. HV = high voltage
5. keV = kiloelectronvolt
6. kx = thousand times magnification
7. kV = kilovolts
8. m/d/y = month/day/year
9. mm = millimeters
10. REE = Rare Earth Element
11. WD = working distance
12. X = times magnified

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

VANADIUM MINERALS IN CLAY

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FIGURE
25

uranium-bearing bedrock cliffs
eroding through alluvial (gravity/general weathering)
and fluvial (water) processes

natural variability of uranium distribution
in bedrock causes variability of uranium
content in eroded sediments

SANDSTONE

HIGH URANIUM

LOW URANIUM

SANDSTONE

alluvial fan

SANDSTONE

ERODED MATERIAL

alluvial fan

alluvium formed through waterborne
transport and deposition of sediments

SHALE

meandering streams result in
deposition of lenses of high-uranium
uranium or low-uranium matrial

LEGEND

HIGH URANIUM SEDIMENT

LOW URANIUM SEDIMENT

HIGH URANIUM GROUNDWATER

LOW URANIUM GROUNDWATER

SAND
SILTY SAND
CLAYEY SAND
CLAY
SHALE / BEDROCK
WATER TABLE
GROUNDWATER WELL
mg/L MILLIGRAMS PER LITER
TDS TOTAL DISSOLVED SOLIDS

DD2	(average)
Alkalinity (as CaCO3)	300 mg/L
TDS	2,420 mg/L
Dissolved Uranium	0.228 mg/L

ND	(average)
Alkalinity (as CaCO3)	283 mg/L
TDS	1,600 mg/L
Dissolved Uranium	0.0396 mg/L

A DD2 ND A'

MIDDLE CHINLE AQUIFER

SHALE

West Fault

ALLUVIUM

UPPER CHINLE AQUIFER

East Fault

SHALE

SEDIMENTS LOW IN URANIUM

A DD2 ALLUVIAL CHANNEL ND A'

MIDDLE CHINLE AQUIFER

UPPER CHINLE AQUIFER

LOCALIZED LEACHING OF URANIUM
BOUND IN SEDIMENTS INTO GROUNDWATER

West Fault

East Fault

LITHOLOGY IN THE EASTERN
SIDE OF THE ALLUVIAL CHANNEL
IS NOT UNDERSTOOD IN DETAIL

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

CONCEPTUAL SITE MODEL DIAGRAM

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FIGURE 26

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
E:\Grants_Shawn\Figure26_ConceptualSiteModelDiagram.dwg LAYOUT: SECTION A-A' SAVED: 8/2/2018 5:17 PM ACADVER: 19.1S (LMS TECH)
PAGESETUP: --- PLOTSTYLETABLE: ACAD.CTB PLOTTED: 8/2/2018 5:17 PM BY: PETERSON, KEITH
(LMS TECH)

ATTACHMENT A: GEOPHYSICAL LOGS FROM THE 2016 USGS SSE

GEOPHYSICAL LOG INTERPRETATION

ARCADIS Design & Consultancy for natural and built assets

Well Name:	WELL DD	**Drilling Company:**		**Well Owner:**	HOMESTAKE MINING COMPANY	**Comment:**	
Project Location:	Grants Reclamation Project	**State:**	NEW MEXICO	**Country:**		Revised 10-2-2017. Shifted U-ppm and Th;K Ratio data upward 3.21 feet due to depth error	
Survey Date:	10-August-16	**Calc. Method:**		**Diagram Type:**			
Operator:	USGS	**Tools:**		**Comment:**	PROCESSED WITH WELLCAD VER. 5.2		
Total MD:		**Tools:**		**Comment:**	8/14/2017		

GAM(NAT)
0 API 200
IND_RES
0 OHM-M 80
U-PPM
30 PPM 0
Th/K Ratio
1 ppm/% 100

Depth
1ft:50ft

Lithology - Reinterpreted

WELL CONSTRUCTION
5 inch 5 Comment

0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
30.0
32.0
34.0
36.0
38.0
40.0
42.0
44.0
46.0
48.0
50.0
52.0
54.0
56.0
58.0
60.0
62.0
64.0
66.0
68.0
70.0
72.0
74.0
76.0
78.0
80.0

4-inch Diameter PVC Riser

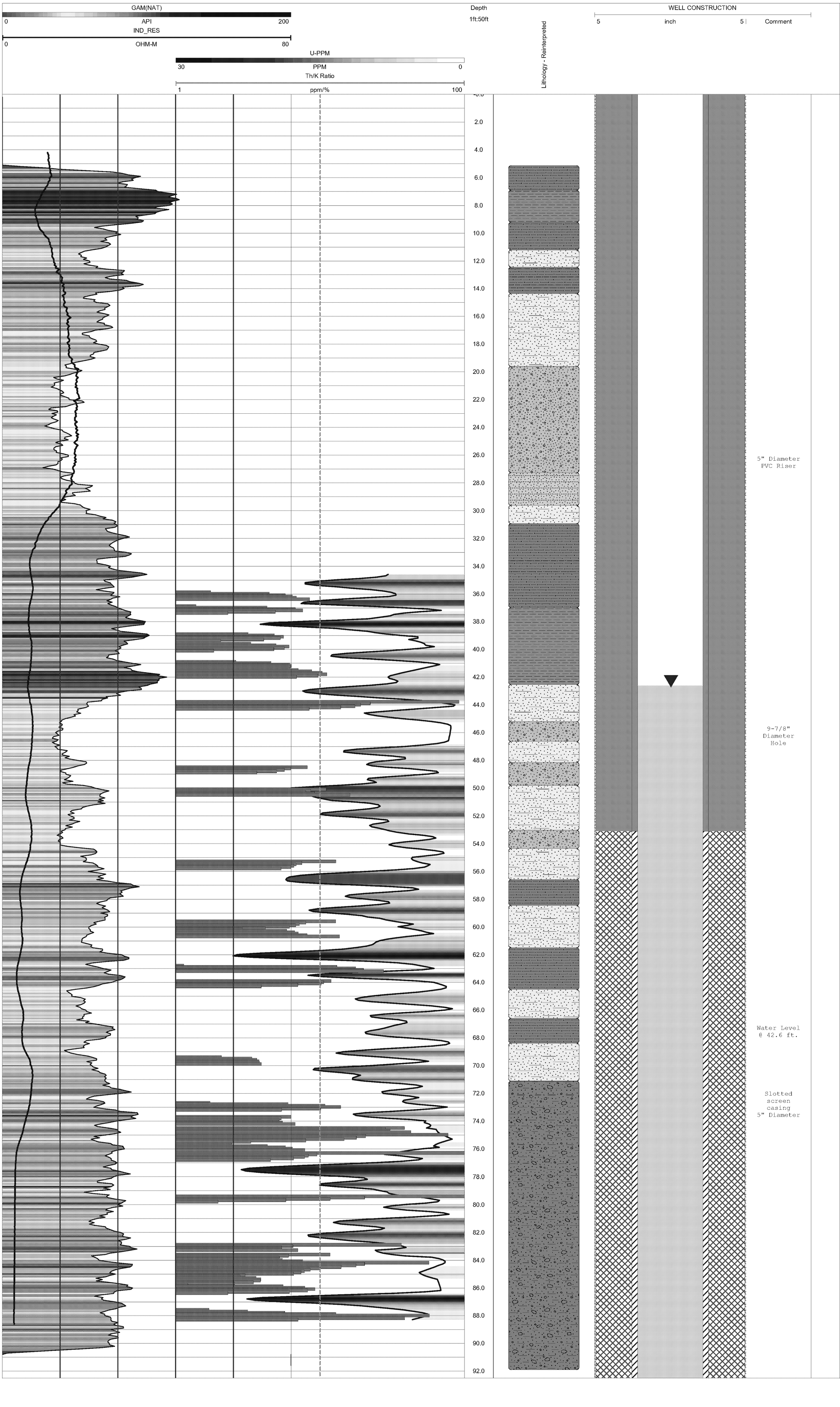
9-7/8" Diameter Hole

4-inch Diameter Slotted PVC Screen

Water Level @ 43.9 ft

GEOPHYSICAL LOG INTERPRETATION

Well Name:	WELL DD2	**Drilling Company:**		**Well Owner:**	HOMESTAKE MINING COMPANY	**Comment:**	
Project Location:	Grants Reclamation Project	**State:**	NEW MEXICO	**Country:**			Revised 10-2-2017. Shifted U-ppm and Th;K Ratio data upward 3.21 feet due to depth error
Survey Date:	12-August-16	**Calc. Method:**		**Diagram Type:**			
Operator:	USGS	**Tools:**		**Comment:**	PROCESSED WITH WELLCAD VER. 5.2		
Total MD:		**Tools:**		**Comment:**	8/15/2017		



GEOPHYSICAL LOG INTERPRETATION

ARCADIS Design & Consultancy for natural and built assets

Well Name:	WELL MV	**Drilling Company:**		**Well Owner:**	HOMESTAKE MINING COMPANY	**Comment:**	
Project Location:	Grants Reclamation Project	**State:**	NEW MEXICO	**Country:**		Revised 10-2-2017. Shifted U-ppm and Th/K Ratio data upward 3.21 feet due to depth error	
Survey Date:	08-August-2016	**Calc. Method:**		**Diagram Type:**			
Operator:	USGS	**Tools:**		**Comment:**	PROCESSED WITH WELLCAD VER. 5.2		
Total MD:		**Tools:**		**Comment:**	8/15/2017		

GAM(NAT)
0 API 200
IND_RES
0 OHM-M 80
U-PPM
30 PPM 0
Th/K Ratio
1 ppm/% 100

Depth
1ft:50ft

Lithology - Reinterpreted

WELL CONSTRUCTION
5 inch 5 | Comment

2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
30.0
32.0
34.0
36.0
38.0
40.0
42.0
44.0
46.0
48.0
50.0
52.0
54.0
56.0
58.0
60.0
62.0
64.0
66.0
68.0
70.0
72.0
74.0
76.0
78.0
80.0
82.0
84.0
86.0
88.0
90.0
92.0
94.0
96.0
98.0
100.0
102.0
104.0

4-inch Diameter PVC Riser

6-1/2 inch Diameter Borehole

Water Level @ 67.2 ft.

4-inch Diameter PVC slotted screen

ED_004985_00011411-00101

GEOPHYSICAL LOG INTERPRETATION

Well Name:	WELL ND	**Drilling Company:**		**Well Owner:**	HOMESTAKE MINING COMPANY	**Comment:**	
Project Location:	Grants Reclamation Project	**State:**	NEW MEXICO	**Country:**			Revised 10-2-2017. Shifted U-ppm and Th;K Ratio data upward 3.21 feet due to depth error
Survey Date:	09-August-16	**Calc. Method:**		**Diagram Type:**			
Operator:	USGS	**Tools:**		**Comment:**	PROCESSED WITH WELLCAD VER. 5.2		
Total MD:		**Tools:**		**Comment:**	8/15/2017		

GAM(NAT)
0 API 200
IND_RES
0 OHM-M 80
U-PPM
30 PPM 0
Th/K Ratio
1 ppm/% 100

Depth
1ft:50ft

Lithology - Reinterpreted

WELL CONSTRUCTION
5 inch 5 Comment

2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
30.0
32.0
34.0
36.0
38.0
40.0
42.0
44.0
46.0
48.0
50.0
52.0
54.0
56.0
58.0
60.0
62.0
64.0
66.0
68.0

4 inch
Diameter PVC
Riser

Hole
Diameter
Unknown

Water Level
@ 38.45 ft.

4 inch
Diameter
Slotted PVC
Screen

GEOPHYSICAL LOG INTERPRETATION

ARCADIS Design & Consultancy for natural and built assets

Well Name:	WELL Q	**Drilling Company:**		**Well Owner:**	HOMESTAKE MINING COMPANY	**Comment:**
Project Location:	Grants Reclamation Project	**State:**	NEW MEXICO	**Country:**		Revised 10-2-2017. Shifted U-ppm and Th:K Ratio data upward 3.21 feet due to depth error
Survey Date:	10-August-16	**Calc. Method:**		**Diagram Type:**		
Operator:	USGS	**Tools:**		**Comment:**	PROCESSED WITH WELLCAD VER. 5.2	
Total MD:		**Tools:**		**Comment:**	8/15/2017	

GAM(NAT)
0 API 200
IND_RES
0 OHM-M 80
U-PPM
30 PPM 0
Th/K Ratio
1 ppm/% 100

Depth
1ft:50ft

Lithology - Reinterpreted#2

WELL CONSTRUCTION
5 inch 5 | Comment

4-inch Diameter PVC riser

8-3/4 inch Diameter Hole

Water Level @ 41.2 ft.

4-inch Diameter PVC Slotted Screen

ED_004985_00011411-00103

GEOPHYSICAL LOG INTERPRETATION

ARCADIS

Well Name: WELL T11	Drilling Company:	Well Owner: HOMESTAKE MINING COMPANY	Comment:
Project Location: Grants Reclamation Project	State: NEW MEXICO	Country:	Revised 10-2-2017. Shifted U-ppm and Th:K Ratio data upward 3.21 feet due to depth error
Survey Date: 13-August-2016	Calc. Method:	Diagram Type:	Revised 10-24-2017. Revised fill patterns to reflect coarse vs. fine conditions
Operator: USGS	Tools:	Comment: PROCESSED WITH WELLGAD VER. 5.2	
Total MD:	Tools:	Comment: 8/16/2017	

U-PPM - > 83.1 Feet
30 PPM 0
Th/K Ratio
1 ppm/% 100
GAM(NAT) - >83.1 Feet
0 API 200
IND_RES
0 OHM-M 16
GAM(NAT) - Surface to 83 Feet
0 API 25000
U-PPM - Surface to 83 Feet
1800 PPM 0

Depth
1ft:50ft

Lithology - Reinterpreted

WELL CONSTRUCTION
5 inch 5 | Comment

5 inch Diameter PVC Riser

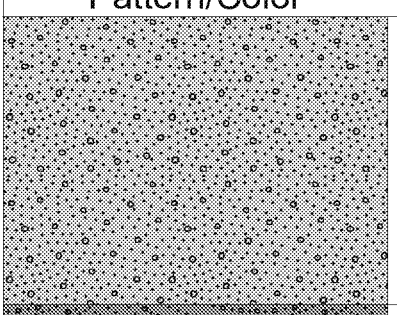
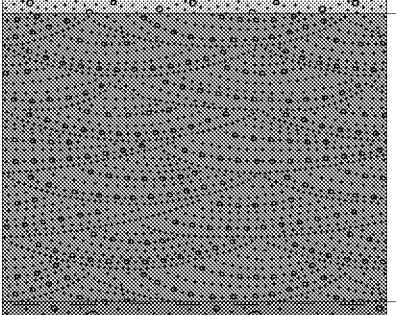
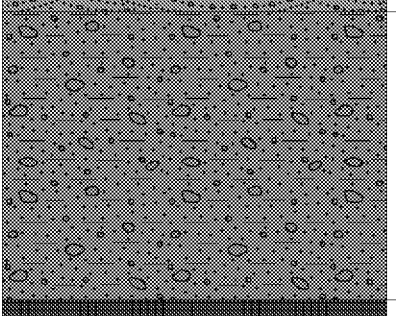
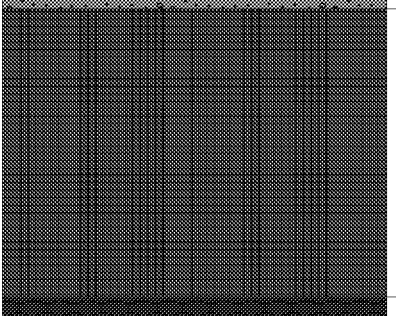
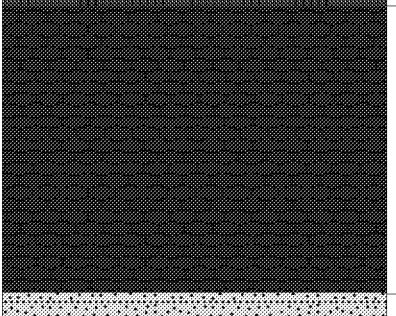
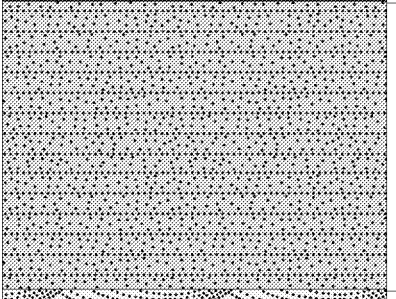
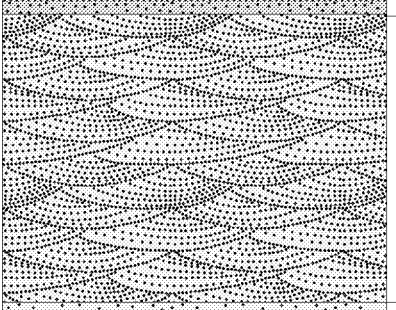
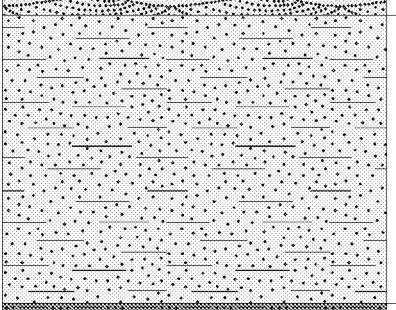
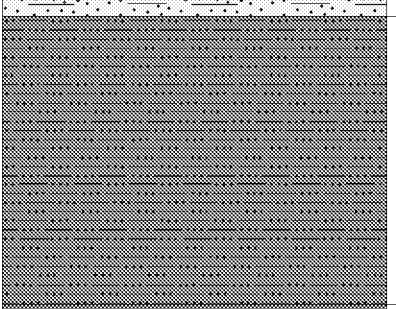
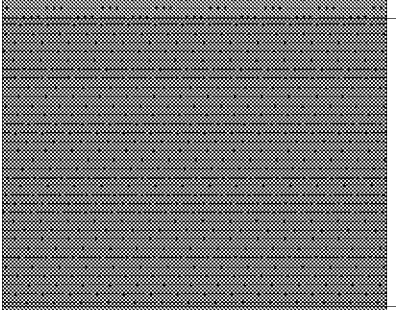
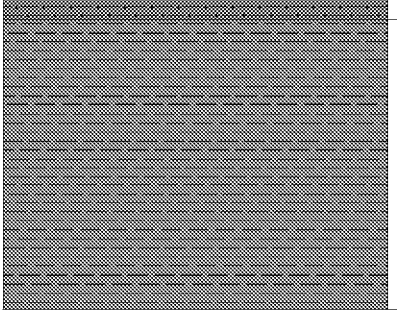
Hole Diameter 9 inches

Water Level @ 110.9 ft.

5 inch diameter Slotted PVC Screen

ED_004985_00011411-00104

Lithologic Key for Geophysical Logs

Pattern/Color	Description
	Well Graded Sand or Gravel (GW/SW)
	Well Sorted Sand and Gravel (SP/GP)
	Clayey Gravel (GC)
	Fine Grained Fill
	Coarse Grained Fill
	Well Sorted Fine Sand (SP)
	Well Sorted Coarse Sand (SP)
	Clayey/Silty Sand (SC/SM)
	Chinle Shale Unit
	Sandy Clay (SP-CL)
	Clay (CL)

ATTACHMENT B: GEOPHYSICAL LOGS FROM BOREHOLES DD-BK AND DD2-BK

ARCADIS Design & Consultancy for natural and built assets

Geophysical Logging Services

Arcadis U.S., Inc.
150 Market Street, Suite 725
Indianapolis, Indiana 46204

WELL NAME: BORING DD-BK **CLIENT:** BARRICK GOLD CORP.

PROJECT LOCATION: GRANTS, NEW MEXICO

WELL COORDINATES:

PROJECTION:

SURFACE ELEVATION:

CASING STICK-UP:

DEPTH TO GROUNDWATER:

CASING DIAM.: 2 IN. **LENGTH:** 85 FEET

O.H. DIAM.: **FROM:** **TO:**

DATE LOGGED: 01/25/2018

LOGGED BY: Gabriel Hebert

CASING TYPE: PVC RISER

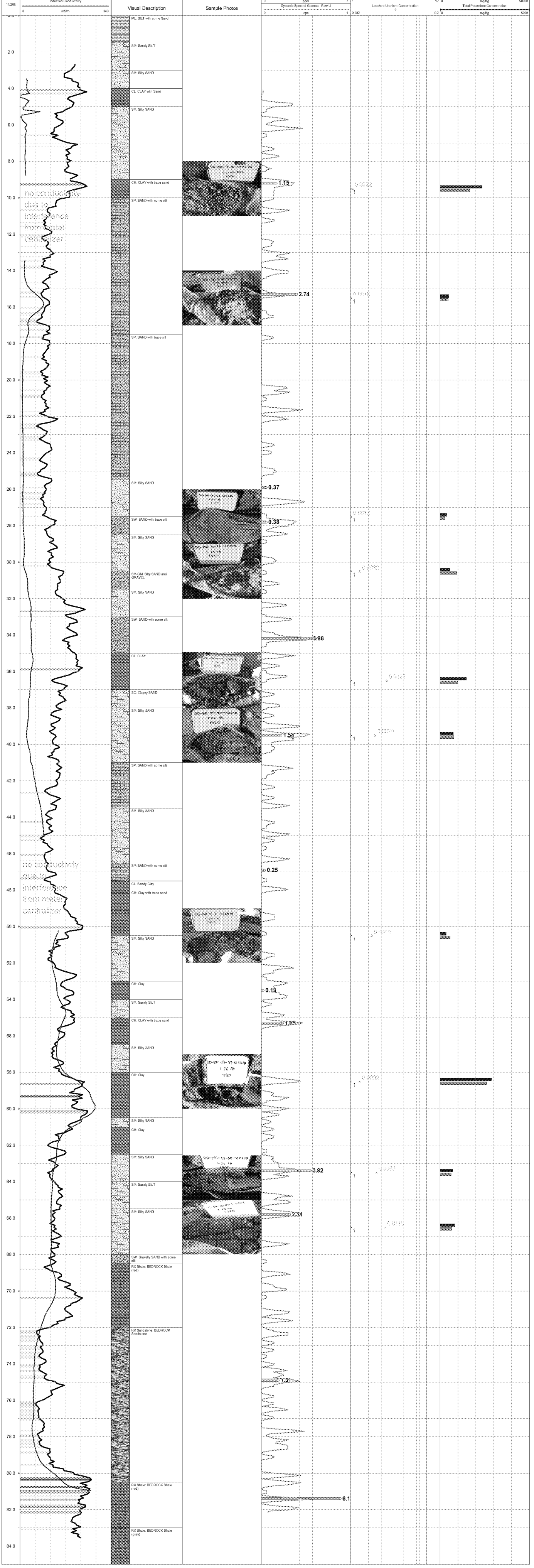
TOTAL DEPTH: 85 FEET

REMARKS:

STATIC SPECTRAL GAMMA LOGGED ON 1/25/2018

Logging Probes Used

- [x] Natural Gamma
- [ ] SPR/SP
- [ ] Fluid Temperature/Resistivity
- [x] Induction Conductivity
- [ ] Normal Resistivity
- [ ] 3-Arm Caliper
- [ ] Accustic Televiewer
- [ ] Optical Televiewer
- [ ] Heat Pulse Flow Meter
- [ ] Spinner Flow Meter
- [x] Spectral Gamma
- [ ] Full Waveform Sonic
- [ ] Nuclear Magnetic Resonance
- [ ] Other: _____



ARCADIS
Design & Consultancy for natural and built assets
Geophysical Logging Services

Arcadis U.S., Inc.
150 Marker Street, Suite 726
Indianapolis, Indiana 46204

WELL NAME: BORING DD2-BK
CLIENT: BARRICK GOLD CORP.
PROJECT LOCATION: GRANTS, NEW MEXICO

WELL COORDINATES:
PROJECTION:
SURFACE ELEVATION:
CASING STICK-UP:
DEPTH TO GROUNDWATER:
CASING DIAM.: 2 IN. LENGTH: 100 FT
O.H. DIAM.: FROM: TO:

DATE LOGGED: 01/24/2018
LOGGED BY: Gabriel Hebert
CASING TYPE: PVC RISER
TOTAL DEPTH: 100 FEET
REMARKS:
STATIC SPECTRAL GAMMA LOGGED ON 1/25/2018

Logging Probes Used

- [x] Natural Gamma
- [ ] SPR/SP
- [ ] Fluid Temperature/Resistivity
- [x] Induction Conductivity
- [ ] Normal Resistivity
- [ ] 3-Arm Caliper
- [ ] Acoustic Televiewer
- [ ] Optical Televiewer
- [ ] Heat Pulse Flow Meter
- [ ] Spinner Flow Meter
- [x] Spectral Gamma
- [ ] Full Waveform Sonic
- [ ] Nuclear Magnetic Resonance
- [ ] Other: _____

Depth
Natural Gamma Ray 0 cps 120
Induction Conductivity* 0 mS/m 340
Visual Description
Sample Photos
Spectral Gamma Logging Results
Static Spectral Gamma: U - Weight Percent 0 ppm 7
Dynamic Spectral Gamma: Raw U 0 cps 1
Laboratory Analytical Results (ELI)
Total Uranium Concentration 1 mg/Kg 12
Leached Uranium Concentration 0.002 mg/L 0.2
Total Iron Concentration 0 mg/Kg 50000
Total Potassium Concentration 0 mg/Kg 5000

CL: CLAY with trace sand
SM: Silty SAND
CH: CLAY
SM: Silty SAND
SP: SAND with trace silt
SP: SAND with some silt
SP: SAND with trace silt
SW: SAND and GRAVEL
SP: SAND with some silt
SW: SAND and GRAVEL
SP: SAND with silt
SC: Clayey SAND
SM: Silty SAND
CH: CLAY
SM: Silty SAND
SP: SAND with silt
CH: CLAY
SM: Silty SAND
CH: CLAY with some sand
SM: Silty SAND
CH: CLAY
SM: Sandy SILT
CH: CLAY
SM: Silty SAND
SW: Gravely SAND with silt
GP: GRAVEL with sand
SW: SAND with gravel
SP: SAND with silt
CL: Sandy CLAY
GC: Clayey GRAVEL
RX Shale: BEDROCK Shale (red)
RX Shale: BEDROCK Shale (gray)

no conductivity due to interference from metal container

1.95
2.40
2.40
2.33
1.24
4.26
4.70
0.00
1.67
1.76
2.32
3.36
0.79
3.74
3.95
5.68

SUPPLEMENTARY INFORMATION

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

Contents

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2016 USGS SSE Comparison of HMC Data with USGS Data 1
2016 USGS SSE Geophysical Methods and Results 2
2016 USGS SSE Passive Sampler Bench Testing Methods and Results 3
2016 USGS SSE Isotope and Dating Analysis Results 3
Stable Isotope Background 4
Stable Oxygen and Hydrogen Isotopes of Water 4
Sulfate and Stable Isotopes of Sulfate 5
Nitrate and Stable Isotopes of Nitrate 6
Alkalinity and Dissolved Inorganic Carbon 7
Carbon-14 8
Chlorofluorocarbons 10
Tritium-Helium 11
Summary 12
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INTRODUCTION

The Supplementary Information has been prepared to provide additional detail on the methods and results of the 2016 USGS SSE, the subsequent laboratory testing to validate passive sampling methods used in the 2016 USGS SSE, and the soil investigations from boreholes DD-BK and DD2-BK. References are included in the References section of the main text.

2016 USGS SSE Comparison of HMC Data with USGS Data

Arcadis the USGS and HMC data and concluded the following:

- Dissolved and total major cations (sodium, potassium) had a coefficient of correlation (R^2) of >0.8; however, total and dissolved calcium and magnesium were more variable among split samples, likely due to the particle-reactive nature of these cations and variability in the calcium and magnesium concentrations during sampling.
- Anions were well correlated (R^2 > 0.8) except for nitrate/nitrate (very poorly correlated, with much higher nitrate concentrations recorded by HMC versus USGS). This may be due to the lability of nitrate and nitrite and differences in sample handling and preservation (temperature during shipment) after sampling.
- The nitrogen stable isotope ($\delta^{15}N$) and oxygen stable isotope ($\delta^{18}O$) of nitrate were also very different among the split samples (R^2 ~0.1 for $\delta^{15}N$, 0.7 for $\delta^{18}O$, poor correlation). This is likely due to the same issue related to the reason for the difference between nitrate concentrations in the samples (differences in sample handling and preservation).
- The comparison of the stable isotope of sulfur in sulfate among the split samples was very good (R^2 = 0.99); sulfate is very non-reactive and soluble and variations in preservation did not affect this analysis.
- Ammonia was not detected in the HMC samples; however, USGS reported concentrations up to ~0.25 mg/L; this may also be due to differences in sample handling after sampling.
- There was a very significant difference in total and dissolved iron between the two groups. HMC reported <0.1 mg/L for both (except for one location at near 1 mg/L), while the USGS reported concentrations between 2 and 2.5 mg/L at specific locations. This indicates that either the USGS samples were contaminated with iron, or the HMC samples were not properly preserved with acid to maintain dissolved iron during shipment before analysis (and before filtering by the lab as part of the preparative step for inductively coupled plasma [ICP] analysis). Given that other cationic trace elements were analyzed from the same bottle and did not show similar differences (the manganese correlation was 0.9999, for example), it is possible that there was an issue with sample handling with the USGS samples.
- Trace elements (antimony, cadmium, cobalt, chromium, copper, lead, nickel, zinc) that are poorly soluble at circumneutral pH showed poor correlation; however, this was likely due to the fact that they were present at very low concentrations (just above reporting limits) and may also be subject to the presence or absence of particulates skewing the concentrations high or low.

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- Trace elements (arsenic, molybdenum, selenium, vanadium) showing good solubility at circumneutral pH all had correlation coefficients greater than 0.8.
- Isotopic uranium and radium, and total and dissolved uranium, were well correlated among split samples ($R^2 > 0.8$).
- Stable hydrogen (δ^2H) and oxygen ($\delta^{18}O$) isotopes of water, tritium (^3H), helium-4 (^4He), and dissolved chlorofluorocarbons (CFCs), were generally in good agreement among the split samples with some minor variations in the results.

2016 USGS SSE Geophysical Methods and Results

Borehole geophysical logging was included to: a) quantitatively and graphically contextualize the soil descriptions and geochemical results; b) provide insight into the stratigraphy and allow an objective means of correlating between boreholes including the wells that the USGS logged in 2016, particularly important due to the inconsistent and undetailed descriptive information obtained during the drilling of existing wells; c) yield direct, in-situ estimation of the concentration of total uranium in the formation; d) guide decision-making about mineralogical analysis of samples. The geophysical assessment activities consisted of: 1) collection of geophysical parameters through the operation of borehole geophysical probes and 2) post-fieldwork data processing of the raw field data. The types of data obtained included natural gamma ray, spectral gamma ray, and induction conductivity. The following summarizes the specifications for the probes:

Probe Type	Model	Diameter (inches)	Length (inches)	Sensor Technology
Natural Gamma Ray	2PGA-1000	1.63	31.3	Scintillometer: NaI(Tl) .875"x3.0"
Spectral Gamma Ray	2SNA-1000S	1.5	46.61	Scintillometer: NaI(Tl) .875"x3.0" (temperature compensated)
Induction Conductivity	2EMA-1000	1.44	66.9	Tx-Rx separation of 50 cm, 39.2KHz Operating Frequency

Natural gamma ray and induction conductivity logging was completed in a single, continuous pass at an approximate logging speed of 12 feet per minute. The raw output from natural gamma ray and induction conductivity, aside from possible spatial filtering, no additional post-processing was necessary.

Spectral gamma ray logging was performed in two modes: dynamic and static. Dynamic logging is mainly conducted as a means of selecting specific locations at which to perform static measurements. This is because the statistically random nature of the gamma ray spectrum does not lend itself to dynamic, continuous measurements. To increase confidence, dynamic logging was conducted at a relatively low logging speed of 3 feet per minute in a downward and then upward pass. This approach provided data for rough estimation of the uranium concentration in the alluvium. The dynamic data were reviewed in the field to select the specific static measurement locations, where the static data provided higher accuracy and precision than the dynamic data. Each static measurement was made over a 15- to 20-minute period to ensure that a statistically significant integrated value would result. The spectral gamma ray data were modeled after fieldwork in WellCAD to calculate the estimated uranium, thorium, and potassium content

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of the alluvium at specific fixed locations. The stripping method was used, and a specific calibration model for the logging probe was used to calculate the weight-based concentrations.

Borehole geophysical graphic logs were produced using WellCAD portraying the geophysical results, visual lithology descriptions, and relevant analytical results to facilitate comparison of the geophysical, observational, and laboratory data. Appendix B contains the graphical logs.

2016 USGS SSE Passive Sampler Bench Testing Methods and Results

New PDS bottles for laboratory testing were constructed in the same manner used in the 2016 Study with minor exceptions: the opening in the lab PDSs was approximately 0.25 to 0.5 inch smaller in diameter than those used in the field (which could slightly decrease the rate of diffusion), and the netting that held the stack of samplers in a vertical column in the field was not used (which likely increased the rate of diffusion; Figure S1). The test was conducted by deploying six inverted, deionized water-filled samplers into a 3-gallon bucket filled with a simulated groundwater solution. Sample bottles were removed from the test bucket and submitted for analysis at 24 hours, 1 week, 2 weeks, 4 weeks, 6 weeks, and 8 weeks of incubation. A baseline sample of the simulated groundwater solution was collected at the start of the evaluation. Electrical conductivity (EC) was measured inside each sampler at the time of sampling to serve as a real-time proxy of the progress of the water (ion) exchange in each of the samplers. Further details are listed in Table S2.

Data were evaluated through percent diffusion where the fully mixed solution (simulated groundwater solution mixed with six bottles containing 250 mL each of deionized water) was the target concentration. If sample water inside a bottle was equal to the calculated concentration in the theoretical fully mixed solution, the sample was said to have obtained 100 percent diffusion. The fully mixed target concentrations are estimates, as early sample bottles were removed from the solution before they achieved 100 percent diffusion; this reduced the amount of deionized water that mixed into the baseline solution and positively biases the calculated percent diffusion in subsequently collected samples, making samples appear to be more equilibrated than they actually were. The calculated concentrations of metals in the fully mixed solution are provided, along with the aqueous analytical data, in Table S3. The actual measured concentrations in each PDS are displayed on Figures S2 and S3, which show the initial simulated groundwater solution concentration (not accounting for dilution) as a guideline.

2016 USGS SSE Isotope and Dating Analysis Results

As part of the 2016 USGS SSE, groundwater samples and one reverse osmosis system sample were collected for analysis of the following environmental tracers:

- Stable oxygen and hydrogen isotopes of water
- Stable sulfur isotopes of sulfate
- Stable oxygen and nitrogen isotopes of nitrate
- Stable carbon isotopes of dissolved inorganic carbon (DIC)
- Radioactive carbon-14 (^{14}C) activity of DIC
- Radioactive tritium (T) in water

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- CFCs.

These environmental tracers were evaluated to gain additional insight into the source of water and solutes in groundwater and to estimate the "age" of groundwater. Results of these evaluations are summarized and discussed in the following sections. Note that figures S4-S8 refer to box plots demonstrating how well the 2016 USGS SSE data compare between sampling methods and with historical data trends. These are described in the main text but are not mentioned further herein.

Stable Isotope Background

Isotopes are atoms of the same element that have different masses due to differing numbers of neutrons in the nucleus. For example, there are two stable isotopes of carbon (^{12}C and ^{13}C). A carbon atom with a mass of 12 (denoted ^{12}C) has one more neutron than ^{13}C. The heavier isotopes may react at a reduced rate in physical, chemical, and biological reactions, causing them to "fractionate," or change the relative proportions of various isotopes in reacting materials and reaction byproducts. As a consequence of fractionation processes, water and solutes often develop unique isotopic compositions (ratios of heavy to light isotopes) that may indicate their sources or the processes by which they were formed (Kendall and Caldwell 1998).

Most stable isotopes in substances are measured by isotope ratio mass spectrometry. Stable isotopic compositions are normally reported as "delta" (δ) values in parts per thousand (denoted as ‰, or "per mille") enrichments or depletions relative to a standard of known composition, as shown below for carbon (Clark and Fritz 1997):

$$\delta^{13}C = [(^{13}C/^{12}C)_{sample}/(^{13}C/^{12}C)_{standard} - 1]*1000.$$

Vienna Standard Mean Ocean Water (VSMOW) is the reference against which isotopic compositions of both hydrogen and oxygen are reported, whereas Vienna Canyon Diablo Troilite (VCDT) is the reference for sulfur isotopes, and Pee Dee Belemnite (PDB) is the reference for carbon isotopes. The compositions of each of these standards have been defined as 0‰. A positive (+) δ value indicates that the heavier isotope (e.g., ^{13}C) in the sample is enriched when compared to the standard. A negative (-) δ value indicates that the sample has more of the lighter (e.g., ^{12}C) isotope and is depleted relative to the standard. Reporting of δ values to a known international standard allows direct comparison of sample results.

The analytical precisions with which isotopes are measured are small relative to the ranges in δ values that occur in natural earth systems. For example, typical one standard deviation analytical precisions for nitrogen and oxygen are in the range of 0.05‰ to 0.2‰ (Kendall and Caldwell 1998).

Stable Oxygen and Hydrogen Isotopes of Water

The stable isotopic composition of oxygen and hydrogen in water can be used to identify primary recharge source(s) for groundwater and surface water (e.g., snowmelt versus rainfall) and potential secondary effects due to evaporation or water-rock interactions. The primary goal of measuring stable isotopes of water for site groundwater samples was to assess recharge conditions and to identify water that may have been affected by evaporation of tailing water from the LTP.

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Stable oxygen ($\delta^{18}O$) and hydrogen ($\delta^{2}H$) composition of meteoric water (precipitation) behave predictably within the hydrologic cycle. The "global meteoric water line" (GMWL), defined by Craig (1961), describes the relationship between $\delta^{18}O$ and $\delta^{2}H$ in worldwide fresh surface water:

$$\delta^{2}H = 8*\delta^{18}O + 10 \text{ ‰ Standard Mean Ocean Water (SMOW)}$$

The isotopic composition of water will shift, or fractionate, as a result of meteorological processes (including, but not limited to, temperature effects, evaporation, and condensation), allowing use of isotopes to trace the source of water (Clark and Fritz 1997). Differences in meteorological processes, as well as fractionation that occurs during evaporation or during water-rock interactions, may provide a characteristic fingerprint for origin of water. For example, evaporation of water will cause a shift away from the Global Meteoric Water Line (GMWL), and successively more evaporated water will fall along an "evaporation line" that has a slope less than the GMWL.

The $\delta^{18}O$ values for site groundwater samples ranged from -9.97‰ to -6.40‰, and $\delta^{2}H$ values ranged from -81.1‰ to -56.8‰. Most site groundwater samples plotted along a local meteoric water line (LMWL) with a slope of approximately 7.1 (Figure S9). The slope of 7.1 for the LMWL is typical for arid environments (Ingraham 1998). Groundwater samples collected from the Middle Chinle Aquifer; sample CW18 from the Upper Chinle Aquifer; and alluvial aquifer samples MV, 920, and ST plot towards the lower end of the LMWL, while Upper Chinle Aquifer sample CW50 and alluvial aquifer samples P3, DD, DD2, ND, and Q plot towards the upper end of the LMWL. These results suggest that locations plotting along the lower portion of the LMWL receive recharge primarily from higher elevations (colder recharge) compared with samples that plot towards the upper end of the LMWL (lower elevation, warmer recharge). Samples T11 (alluvial aquifer), CE7 (Upper Chinle Aquifer), and SP2 (reverse osmosis system) plot away from the LMWL with a slope of approximately 4.2, suggesting that water at these locations has undergone substantial evaporation from the LTP. Lower Chinle Aquifer sample CW37 also plotted away from the LMWL, suggesting that water in the Lower Chinle Aquifer at this location has undergone evaporation before recharging the Lower Chinle Aquifer.

Groundwater samples collected at locations upgradient from the LTP, including alluvial aquifer wells DD, DD2, P3, and Q; Upper Chinle Aquifer well CW50; and Middle Chinle Aquifer wells CW1 and CW2, had water stable isotope compositions that fell along the LMWL and did not indicate influence of evaporated water from the LTP. There was substantial variation in the stable isotopic composition of upgradient alluvial groundwater. For example, the 920 samples plotted within the range of Middle Chinle samples, while ND plotted separately from other upgradient alluvial groundwater locations DD, DD2, Q, and P3 (Figure S9). These results indicate that multiple sources of recharge contribute groundwater to the alluvial system, and that groundwater in the alluvium is not uniform in composition.

Sulfate and Stable Isotopes of Sulfate

Groundwater samples were analyzed for sulfur concentrations and sulfur $\delta^{34}S$ values to gain insight into possible sources of sulfate in groundwater. Oxidation of pyrite present in uranium-containing minerals may release sulfur (in the form of sulfate) and may increase mobility of uranium associated with the pyrite. Dissolution of gypsum may also release sulfate to groundwater. In addition, sulfuric acid was used during the uranium milling process (HMC 2012) and may be a source of sulfate to groundwater.

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The valence state of sulfur in various sulfur species ranges from +6 to -2. This wide range in valence states, along with fractionation of sulfur isotopes during microbially mediated changes in speciation, results in isotopic compositions of sulfur from various source materials that are often distinguishable from each other (Krouse and Grinenko 1991, Krouse and Mayer 2000). Values of $\delta^{34}S$ range from about +10‰ to 30‰ in ocean water and evaporite minerals such as gypsum, while negative $\delta^{34}S$ values of -50‰ to +5‰ are typical of diagenetic environments where reduced sulfur compounds are formed (Clark and Fritz 1997). For example, the $\delta^{34}S$ of sulfur derived from limestone can vary between about -30‰ and +30‰ depending on whether the sulfur is in the form of pyrite (-30‰ to +5‰) or gypsum (+10‰ to 30‰), or some mixture of the two, and when the limestone was formed (Krouse and Grinenko 1991; Clark and Fritz 1997).

Jensen (1958) demonstrated that sulfur associated with uranium ores had $\delta^{34}S$ values ranging from -48‰ to 12‰; however, most values were strongly negative. Fishman and Reynolds (1982) reported $\delta^{34}S$ values ranging from -41.6‰ to -29.4‰ for pyrite associated with uranium ore samples collected from the Mariano Lake, New Mexico uranium ore deposit. Robertson et al. (1982) state that sulfuric acid was used during ore processing at most uranium mills and may have $\delta^{34}S$ values ranging from -8‰ to 32‰.

Sulfate $\delta^{34}S$ values for site groundwater samples ranged from -30.4‰ to 7.7‰ and sulfate concentrations ranged from 244 to 4,670 milligrams per liter (mg/L; Figure 15). Groundwater samples collected from upgradient of the LTP (CW-50, DD, DD2, P-3, Q, and 920) had $\delta^{34}S$ values ranging from -30.4‰ to -25.5‰ and sulfate concentrations ranging from 931 to 2,330 mg/L. The $\delta^{34}S$ values less than -25‰ for these upgradient groundwater samples suggest that sulfate was derived from oxidation of a reduced sulfur form such as pyrite. Pyrite may be present in alluvial aquifer sediments derived from mineralized bedrock. The San Mateo Creek system intersects a mineralized zone of the Morrison Formation upgradient from well 920.

Groundwater samples collected near the LTP (CE7, ST, and T11) had $\delta^{34}S$ values ranging from -9‰ to -3.9‰ and sulfate concentrations ranging from 1,850 to 4,670 mg/L (Figure 15). Higher sulfate concentrations and $\delta^{34}S$ values in groundwater samples collected in the vicinity of the LTP compared with upgradient groundwater samples may reflect use of sulfuric acid in the uranium ore milling process. Groundwater samples collected downgradient from the LTP and upgradient sample ND had $\delta^{34}S$ values ranging from -4.9‰ to 7.7‰ and sulfate concentrations ranging from 513 to 1,180 mg/L. The range of $\delta^{34}S$ values in the ND and downgradient groundwater samples suggests that sulfate is derived from a combination of reduced and oxidized sulfur species, such as sulfate derived from both pyrite oxidation and gypsum dissolution. Upgradient groundwater samples CW-50, DD, DD2, P-3, Q, and 920 had $\delta^{34}S$ values that were distinct from groundwater samples collected in the vicinity of and downgradient from the LTP (Figure 15). These results indicate that the LTP likely did not contribute sulfate to upgradient groundwater.

Nitrate and Stable Isotopes of Nitrate

Groundwater samples were analyzed for the stable nitrogen ($\delta^{15}N$) and oxygen ($\delta^{18}O$) composition of nitrate to identify potential controls of nitrate on uranium mobilization. The interaction of oxidants, such as nitrate, can result in the oxidation and mobilization of reduced uranium species (Paradis et al. 2016). Potential sources of nitrogen compounds, either including nitrate or having the potential to generate

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nitrate, in site groundwater include ammonia used during the uranium milling process (HMC 2012), animal waste, local septic systems, and naturally occurring nitrate from atmospheric deposition and soil.

Nitrogen exhibits a wide range of oxidation states in the various compounds containing nitrogen (e.g., +5 for nitrate and -3 for ammonia). This wide range of nitrogen oxidation states results in a wide natural range of nitrogen isotopic compositions for various nitrate sources (Kendall 1998). Using the $\delta^{18}O$ of nitrate value in conjunction with the $\delta^{15}N$ value can help differentiate between potential nitrate sources and determine whether certain biological transformations (i.e., nitrification or denitrification) have occurred. The ratio of the enrichment (accumulation) of ^{15}N to the enrichment of ^{18}O in residual nitrate from denitrification is approximately 2:1 (Bottcher et al. 1990). Hence, nitrate from systems that have experienced significant denitrification plot along a very distinctive line on $\delta^{18}O$ versus $\delta^{15}N$ plots (Figure S10).

In arid environments, naturally produced nitrate may accumulate in shallow soil due to evaporation of infiltrating precipitation water before reaching groundwater. Leaching of this nitrate source can result in groundwater nitrate concentrations as high as 2 mg/L (Nishikawa et al. 2003). Nitrate (as N) concentrations greater than 10 mg/L commonly occur in groundwater beneath and downgradient from septic systems (e.g., Nishikawa et al. 2003, Verstraeten et al. 2004, McQuillan 2004, Esser et al. 2010).

Groundwater sample $\delta^{15}N$ values ranged from 7.0‰ to 23.3‰, and $\delta^{18}O$ values ranged from 3.2‰ to 8.9‰. These nitrate $\delta^{15}N$ and $\delta^{18}O$ values fall within the expected range for natural soil nitrate and for sewage and manure (Figure S10). Groundwater nitrate concentrations ranged from below the laboratory detection limit of 0.1 mg/L at CW50 and DD2 to 16 mg/L at DD and Q. Locations with nitrate concentrations greater than 2.0 mg/L were distributed across the investigation area and included upgradient alluvial aquifer wells 920, DD, ND, P3, and Q; Upper Chinle well CE7; Middle Chinle wells ACW, CW1, and CW2; and Lower Chinle well CW37. These results suggest that nitrate in site groundwater is derived primarily from manure or septic sources because many locations had nitrate concentrations greater than 2 mg/L, which is higher than expected for natural soil sources.

Based on nitrate $\delta^{18}O$ values less than 10‰, nitrate from nitrate-based fertilizer or from industrial processes that use nitrate-based reagents (e.g., nitric acid or nitrate-based explosives) is not indicated. Although the $\delta^{15}N$ and $\delta^{18}O$ values suggest that nitrate could be derived from oxidation of industrial ammonia used during the uranium milling process with subsequent nitrate reduction. Ammonia was detected in groundwater at only one location; 0.11 mg/L at Middle Chinle well CW50 located upgradient from the LTP. Nitrate was not detected in groundwater at CW50, indicating the limited presence of nitrogen species in groundwater at this location.

Alkalinity and Dissolved Inorganic Carbon

Groundwater samples were analyzed for the stable carbon isotope composition ($\delta^{13}C$) of DIC and alkalinity concentrations to gain insight into groundwater inorganic carbon geochemistry and to assess the potential role of groundwater carbonate in mobilization of uranium. Sodium carbonate and sodium bicarbonate were used during the uranium milling process (HMC 2012) and uranium can form complexes with carbonate in oxygenated groundwater with high carbonate content (ATSDR 1999). The DIC $\delta^{13}C$ composition and alkalinity concentrations were also used to support interpretation of groundwater DIC carbon-14 (^{14}C) age dating results, as described below.

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Groundwater carbon geochemistry includes interactions with the atmosphere, biosphere, and geosphere, resulting in multiple sources and sinks of carbon that may vary in time and space (Kalin 2000). Atmospheric concentrations of carbon dioxide (CO_2) are generally low compared with CO_2 concentrations in soil gas. Microbial and plant root respiration contribute CO_2 to soil gas, and the main source of carbon in recharging groundwater typically is derived from dissolution of soil gas CO_2 into the recharging water. Dissolution of CO_2 results in formation of carbonic acid, which drives dissolution of carbonate and silicate minerals, which also contributes DIC to groundwater.

The $\delta^{13}C$ composition of DIC in groundwater will reflect the source or sources of inorganic carbon contributing DIC to groundwater. Sources of DIC in groundwater have varying $\delta^{13}C$ values. For example, atmospheric CO_2 has a small range of $\delta^{13}C$ values between about –8‰ and –5‰, while soil gas CO_2 $\delta^{13}C$ values can range from approximately -30‰ to -8 ‰ (Clark and Fritz 1997). Freshwater carbonates typically have $\delta^{13}C$ values that range from approximately -18‰ to 5‰, although the entire range of $\delta^{13}C$ values is from about -30‰ to 18‰ (Clark and Fritz 1997). Fishman and Reynolds (1982) reported $\delta^{13}C$ values of -18.8‰ to -7.4‰ for carbonates associated with uranium ore samples collected from the Mariano Lake, New Mexico uranium ore deposit, with most samples having $\delta^{13}C$ values greater than -12.5‰. Groundwater DIC $\delta^{13}C$ values have been measured between about -20‰ to 0‰, with values as high as 15‰ reported (Clark and Fritz 1997).

The $\delta^{13}C$ values of DIC in site groundwater samples ranged from -21.7‰ to -3.2‰. Most groundwater samples had DIC $\delta^{13}C$ values greater than -10‰ and alkalinity concentrations between 173 and 592 mg/L (Figure S11). Samples SP2, ST, CE7, and T11 had DIC $\delta^{13}C$ values (less than -10‰) and alkalinity concentrations that were substantially higher (ST, CE7, T11) or lower (SP2) than other groundwater samples (Figure S11). Samples ST, CE7, and T11 had alkalinity concentrations ranging from 729 to 2,140 mg/L, and sample SP2 had an alkalinity concentration of 32 mg/L. The higher alkalinity concentrations and more negative DIC $\delta^{13}C$ values for samples ST, CE7, and T11 indicate that the LTP is a likely source of DIC to groundwater near the LTP, and this DIC source has a DIC $\delta^{13}C$ value that is equal to or more negative than -21.7‰. The low alkalinity concentration in SP2 is consistent with removal of solutes during the reverse osmosis process.

Groundwater samples collected from upgradient alluvial aquifer wells DD, DD2, ND, P-3, Q, and 920 have distinctly different DIC $\delta^{13}C$ values and alkalinity concentrations compared with the three wells that are influenced by the LTP; ST, CE7, and T11 (Figure S11). These results indicate that the LTP likely does not contribute DIC and alkalinity to upgradient alluvial aquifer groundwater.

Carbon-14

Groundwater samples were analyzed for the activity of ^{14}C in DIC as a potential groundwater age dating tool. The ^{14}C age dating technique is an indirect method for age dating of water that is typically used to date groundwater that was recharged more than 60 years ago and relies on the presence of inorganic and organic carbon in the water. ^{14}C, or radiocarbon, is a radioactive isotope with a half-life of approximately 5,730 years (Clark and Fritz 1997). Measured ^{14}C activities are normalized to the international standard known as “modern carbon” (mC) and are reported as percent modern carbon (pmC).

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The ^{14}C in groundwater is typically derived from atmospheric incorporation of $^{14}CO_2$ into the biosphere, release of $^{14}CO_2$ to soil gas from biological processes, with subsequent leaching of soil gas $^{14}CO_2$ to groundwater. Atmospheric concentrations of ^{14}C peaked during atmospheric testing of thermonuclear devices conducted during the 1950s and 1960s, resulting in potential pmC values greater than 100 percent. This influx of ^{14}C to the atmosphere complicates precise interpretation of ^{14}C ages for water with recharge occurring after 1952, which is the case at this site based on detected concentrations of CFCs (described below).

^{14}C values greater than 100 pmC indicate that recharge occurred sometime after 1952, but the inferred, or apparent age, can only be reported as less than 60 years. In addition, mixing of older groundwater with groundwater recharge that has occurred in the past 60 years may result in an underestimate of groundwater age. Measured ^{14}C activities in groundwater samples must also be corrected for various dilution and fractionation effects (Clark and Fritz 1997; Kalin 2000). Processes that may contribute to dilution of ^{14}C in groundwater include dissolution of carbonate minerals, methanogenesis, and microbial degradation of organic matter (Clark and Fritz 1997).

Site groundwater samples had ^{14}C activities ranging from 14.39 to 85.17 pmC (Figure S12). Locations with ^{14}C activities greater than 50 pmC included alluvial aquifer wells Q (57.33 pmC), P3 (72.27 pmC), and ND (85.17 pmC) and Lower Chinle well CW37 (83.10 pmC). Groundwater wells upgradient from the LTP (i.e., ND, P3, Q, DD, and DD2) and Lower Chinle well CE37 had higher ^{14}C activities (greater than 40 pmC) compared with wells downgradient from the LTP. Upper Chinle wells CW50 and CE7 also had higher ^{14}C activities compared with downgradient wells. These results suggest that groundwater in wells upgradient from the LTP and Lower Chinle groundwater in the vicinity of CW37 have a greater modern component of groundwater compared with other monitoring locations. Upper Chinle wells CW50 and CE7 are located along the subcrop of the Upper Chinle Aquifer, indicating that recharge to the Upper Chinle Aquifer occurs near these wells. Lower Chinle well CW37 is located near the subcrop of the Lower Chinle Aquifer within the Alluvium, indicating that recharge to the Lower Chinle Aquifer occurs near CW37.

Clark and Fritz (1997) and Kalin (2000) describe several different models for estimating groundwater ages based on ^{14}C activity. The models were generally developed to account for dilution of the initial recharge ^{14}C of soil gas CO_2 during groundwater recharge and along the groundwater flow path. Depending on the model, calculation of groundwater ages based on ^{14}C requires several pieces of information that are not available for this site including, but not limited to the following:

- Identification of groundwater recharge zones
- Recharge conditions (i.e., open or closed system with respect to DIC reactions)
- Initial ^{14}C activity of DIC in recharge water
- Initial ^{14}C activity of sources of CO_2 that may be contributing DIC to groundwater
- Initial $\delta^{13}C$ of DIC in recharge water
- Initial $\delta^{13}C$ of sources of CO_2 that may be contributing DIC to groundwater
- Initial $\delta^{13}C$ of sodium carbonate and sodium bicarbonate reagents used in uranium milling processes.

Although some of these parameters can be estimated, unique groundwater ages based on ^{14}C activity were not calculated for this site. Kalin (2000) advises that detailed knowledge of the groundwater flow

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system is required to properly interpret any measured ^{14}C activity. As Kalin (2000) states, "It is not meaningful to model the geochemical evolution or radiocarbon mass balance of groundwater between two points that are unrelated, i.e., between two wells that are not on the same flow path or waters from separate aquifer systems." In addition, there is a broad range in DIC ^{14}C activity values (14.39 to 85.7 pmC), alkalinity concentrations (32 to 2,140 mg/L), and DIC $\delta^{13}C$ values (-21.7 to -3.2‰) for site groundwater, and these parameters are not well correlated (Figures S11 and S12). Robertson et al. (2016) concluded that the broad range in DIC $\delta^{13}C$ values (-18.44 to -2.99‰) in groundwater samples supported their conclusions that estimating dilution of ^{14}C activity by processes that add DIC to groundwater would be complicated, and that ^{14}C of DIC was not a reliable indicator of groundwater age for their site.

Chlorofluorocarbons

Groundwater samples were collected for analysis of CFCs at select locations including DD, ND, CW18, CW50, CW15, CW2, and CW37. CFCs are anthropogenic gases that have been released to the atmosphere since the 1930s and 1940s. Small quantities of these gases dissolve naturally in water and, because of low analytical detection limits, detection of one or more of these gases is an indication of modern groundwater recharge (Ekwurzel et al. 1994; Cook and Solomon 1995, Plummer and Busenberg 2000). Three CFCs (trichlorofluoromethane [CFC- 11], dichlorodifluoromethane [CFC-12], and trichlorotrifluorethane [CFC-113]) were evaluated as part of this investigation.

Groundwater CFC results were corrected for salinity, recharge elevation, and recharge temperature using a standard calculation tool provided by the laboratory. The apparent recharge year for water samples was calculated by identifying the concentration of each CFC in air that would be in equilibrium with the water concentration and correlating that concentration to an equivalent atmospheric air concentration at the time of recharge.

CFC data may be influenced by several factors relating to both sampling and current and historical activities at the site. Factors affecting CFC apparent ages include the following (Ekwurzel et al. 1994; Cook and Solomon 1995):

- Rapid or focused recharge (e.g., in fractured rock where "excess" air can become trapped during recharge) can result in an apparent age that is younger than expected.
- CFC mixing ratios in air in urban and industrial areas can exceed regional values and result in an apparent age that is younger than expected.
- Microbial anaerobic degradation of CFCs under sulfate-reducing and methanogenic conditions can result in apparent ages that are older than expected. Biodegradation is more prevalent for CFC-11 and CFC-113, while CFC-12 is relatively stable.
- Sorption, either to particulate and soil matter or to plastic used during sampling, may release or retain CFCs resulting in either older or younger than expected apparent ages. Generally, sorption is not a concern when dedicated plastic tubing is used during sampling.

Mixing of CFC-containing groundwater with older groundwater that does not contain CFC will dilute the CFC concentrations and affect the CFC age estimate. In addition, the atmospheric concentrations of CFC-11 and CFC-113 are not always unique. For example, the atmospheric concentrations of CFC-11

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began declining in 1994, and as of 2001, had declined to approximately the same value it was in 1989. Therefore, unique recharge dates cannot be generated based on CFC-11 concentrations for the period from 1989 to 2001. The same challenge exists for CFC-113 starting in 1991. However, comparison of estimated groundwater ages based on tritium-helium age dating and the different CFCs can be used to constrain the interpretation of possible groundwater ages.

CFCs were detected in all groundwater samples analyzed for CFCs, indicating some component of modern recharge (post-1950) at these locations. Estimated CFC recharge years ranged from 1952 to 1977 for CFC-11, from 1974 to 1991 for CFC-12, and from 1970 to 1985 for CFC-113. Estimated recharge years were more recent (1974 to 1991) for the two alluvial aquifer wells evaluated (DD and ND) compared with bedrock wells (1952 to 1986), suggesting shorter flow paths for modern water recharging the alluvial aquifer versus water recharging the Upper, Middle, and Lower Chinle Aquifers.

Given dilution of CFC concentrations from older groundwater that does not contain CFCs, as confirmed by ^{14}C results, unique groundwater ages based on CFC results were not calculated.

Tritium-Helium

Tritium (^{3}H) is a radioactive isotope with a half-life of 12.3 years (Clark and Fritz 1997). The tritium age dating technique offers a direct measurement of water age for modern waters with recharge dates in the past 60 years (Clark and Fritz 1997). Tritium activities are expressed as absolute concentrations in tritium units (TUs), where 1 TU is equal to 10^{-18} ^{1}H atoms, and no reference standard is required. The concentration of tritium in groundwater reflects the atmospheric concentrations of tritium at the time when the water was recharged, although mixing with older tritium-free water will dilute the measured tritium concentration.

Before the start of atmospheric testing of thermonuclear devices in the early 1950s, tritium concentrations in precipitation water ranged from approximately 2 to 8 TUs. Atmospheric tritium concentrations increased during the 1950s and peaked in about 1963 due to atmospheric testing of thermonuclear devices but have been continually declining since this peak. In 2016, when groundwater sampling was conducted, atmospheric tritium concentrations had returned to original background concentrations at most tritium monitoring locations around the world (Clark and Fritz 1997; Divine and Humphrey 2005). The current 10-year average for the United States (USEPA 2012) for tritium concentrations in precipitation is 7.2 TU. Interpretation of tritium results may be difficult for groundwater samples that contain a mixture of modern (post-1952) water with detectable concentrations of tritium and water that was recharged more than 100 years ago that does not contain tritium, as dilution of the modern tritium signal will occur.

Tritium activity in site samples ranged from 0.1 TU (CW28) to 5.5 TU (DD) (Figure S13). Chinle groundwater samples typically had lower tritium activities (less than 0.5 TU) and lower ^{14}C activities (less than 38 pMC) compared with upgradient alluvial groundwater tritium (0.8 to 5.5 TU) and ^{14}C (40 to 85 pMC). These results demonstrate generally older groundwater ages in bedrock groundwater compared with alluvial groundwater. Notable exceptions were DD2, with low tritium (0.4 TU), compared with DD (5.5 TU) and other upgradient wells (920, Q, P3), with tritium activities from 2.2 to 3.6 TU. 14C activity for these upgradient wells ranged from 40 to 85 pMC. Variability in the tritium and ^{14}C composition of upgradient alluvial groundwater suggests that multiple sources of recharge contribute groundwater to the alluvial system and that flow through the alluvium is not uniform.

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These results, in conjunction with the ^{14}C data, indicate a mix of modern and older water. Because of the presence of older groundwater, unique groundwater ages were not calculated.

Summary

In summary, results from the environmental tracer analysis portion of the SSE indicate the following:

- Stable isotopes of water demonstrate an evaporation signature for groundwater in the vicinity of the LTP. This evaporation signal is not observed in upgradient alluvial groundwater samples.
- Stable isotopes of upgradient alluvial groundwater samples demonstrate a wide range of compositions that suggest recharge of groundwater from multiple sources.
- Stable sulfur isotopes of sulfate demonstrate a range of compositions that suggest input of sulfate to groundwater from oxidation of pyrite minerals and dissolution of evaporites. Use of sulfuric acid during the milling process may have contributed sulfate to groundwater in the vicinity of and downgradient from the LTP.
- Stable sulfur isotopes of sulfate in upgradient alluvial groundwater samples suggest that sulfate was derived from oxidation of a reduced sulfur form such as pyrite. Pyrite may be present in alluvial aquifer sediments derived from mineralized bedrock. The San Mateo Creek system intersects a mineralized zone of the Morrison Formation upgradient from well 920.
- The stable isotopes of nitrate values fall within the expected range for natural soil nitrate and for sewage and manure. Although oxidation of manufactured ammonium may be contributing nitrogen to groundwater, contributions of manufactured nitrate used in nitrate-based explosives, nitric acid, or fertilizers is not indicated.
- Higher alkalinity concentrations and more negative DIC $\delta^{13}C$ values for samples ST, CE7, and T11 indicate that the LTP is a likely source of DIC to groundwater near the LTP, and this DIC source has a DIC $\delta^{13}C$ value that is equal to or more negative than -21.7‰.
- Groundwater samples collected from upgradient alluvial aquifer wells DD, DD2, ND, P-3, Q, and 920 have distinctly different DIC $\delta^{13}C$ values and alkalinity concentrations compared with the three wells that are influenced by the LTP; ST, CE7, and T11. These results indicate that the LTP likely does not contribute DIC and alkalinity to upgradient alluvial aquifer groundwater.
- Site groundwater samples had ^{14}C activities ranging from 14.39 to 85.17 pmC, indicating a broad range of apparent groundwater ages that are thousands of years old. Due to the complexity of the hydrogeologic system and the broad range of DIC concentrations, unique ^{14}C groundwater ages were not calculated for SSE samples.
- CFC and tritium data demonstrated that alluvial and bedrock groundwater have a component of modern water recharged since about 1950. Given the presence of older groundwater, indicated by ^{14}C activities, unique groundwater ages were not calculated based on CFC or tritium results.

Multiple lines of evidence, including stable isotopes of water, stable isotopes of nitrate, sulfate concentrations and stable sulfur isotopes, ^{14}C activity of DIC, and tritium results demonstrate different compositions of upgradient alluvial aquifer groundwater that is distinctly different from groundwater affected by the LTP. These results demonstrate the upgradient alluvial aquifer groundwater is not affected

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by the LTP. Heterogeneity of environmental tracer composition within the alluvial aquifer groundwater upgradient from the LTP indicates that multiple sources of recharge and non-uniform flow through the alluvial aquifer system.

SUPPLEMENTARY INFORMATION TABLES

ARCADIS Design & Consultancy for natural and built assets

Well ID	Temperature (degrees Celcius)	Conductivity (microSeimens per centimeter)	Dissolved Oxygen (mg/L)	pH (s.u.)	ORP (mV)	Turbidity (NTU)	Meets Arcadis Parameter Stabilization Standard
0920	13.30	3073	0.12	7.22	41.0	0.76	FALSE
ACW	13.20	2702	0.07	8.6	-20.7	1.75	FALSE
CW15	12.60	2438	0.34	8.3	98.6	0.38	FALSE
CE7	14.50	9385	6.28	7.4	97.5	5.11	FALSE
CW1	15.90	2407	0.17	8.6	129.0	0.15	FALSE
CW-18	12.90	3015	2.46	7.2	15.4	0.37	FALSE
CW-2	15.10	2132	0.18	8.6	135.1	0.42	TRUE
CW28	14.50	1799	2.44	8.6	106.9	1.6	FALSE
CW-37	13.00	2124	0.95	7.4	109.9	0.17	FALSE
CW45	13.70	1985	3.81	7.3	94.6	1.67	FALSE
CW50	13.30	2206	0.06	7.3	37.5	0.27	FALSE
DD	13.60	4057	3.37	7.2	76.2	2.66	FALSE
DD-2	13.10	3165	0	6.9	72.6	0.61	FALSE
MV	14.30	2606	2.81	6.9	77.6	0.58	FALSE
ND	13.00	2666	6.07	7.8	75.5	1.98	FALSE
P-3	12.90	3343	1.98	7.4	62.9	0.37	FALSE
Q	13.00	3204	0	7.2	72.4	0.39	FALSE
SP2	15.50	1036	7.39	6.8	53.4	0.45	NA
ST	14.00	3918	0.15	7.3	126.4	1.05	FALSE
T-11	14.90	9989	NA	9.7	80.2	3.15	FALSE

Notes:
mg/L - milligram per liter
mV - millivolt
NA -- Not applicable; well was pumping and no separate purge was conducted
NTU - nephelometric turbidity units

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Table S2
Laboratory PDS Testing: Solution Recipe
Grants Reclamation Project

Reagent	Amount	Final Concentration (mg/L)
$NaHCO_3$	10207 mg	504
$Na_2SeO_4 \cdot 10H_2O$	4.2 mg	0.15 mg/L as SeO_4^{2-}
100 mg/L UO_2^{2+} stock solution	60 mL	1.0 mg/L as UO_2^{2+}
KCl	4488 mg	748
NaCl	4488 mg	748

Notes:
Amounts are calculated for a final solution volume of six liters
KCl - potassium chloride
mg - milligram
mL - milliliter
mg/L - milligram per liter
NaCl - sodium chloride
$NaHCO_3$ - sodium carbonate
$Na_2SeO_4 \cdot 10H_2O$ - sodium selenate decahydrate
SeO_4^{2-} - selenate ion
UO_2^{2-} - uranyl ion

Table S3
Laboratory PDS Testing: Aqueous Analytical Results
Grants Reclamation Project

	Baseline (bulk solution)	Bulk solution with added sampler water[a]	24 hour	Week 1	Week 2	Week 4	Week 6	Week 8
Analyte	Result (mg/L)							
Total metals[b]								
Potassium	348	278	53	75	110	233	313	293
Selenium	0.209	0.167	0.027	0.034	0.050	0.117	0.140	0.164
Sodium	646	517	95	133	201	445	628	604
Uranium	9.10	7.28	0.477	1.17	2.11	5.26	8.97	9.96
Dissolved metals[b]								
Potassium	338	270	62	78	125	284	295	316
Selenium	0.275	0.22	0.032	0.051	0.055	0.126	0.164	0.184
Sodium	631	505	104	132	219	472	611	644
Uranium	9.43	7.54	0.486	1.03	2.06	5.42	8.00	8.86

Notes:

[a] Calculated based on reagent masses used to make 6 liters of simulated well water (bulk solution) when mixed with all deionized water introduced by the passive samplers (6 bottles with 250 milliliters of deionized water).

[b] Sodium and potassium were quantified using method SW6010B; selenium and uranium were quantified using method SW6020

mg/L - milligram per liter

Table S4
Laboratory PDS Testing: Measured Laboratory Parameters Over Time
Grants Reclamation Project

Sample	pH (s.u.)	Conductivity (µS/cm)	Temperature (degrees Celcius)
Initial (Bulk Solution)	7.05		11.5
24 Hours	7.10	730.00	11.7
Week 1	7.28	932.0	12.0
Week 2	7.36	1571	12.3
Week 4	7.30	2928	12.2
Week 6	8.00	3650	12.0
Week 8	8.87	4170	12.0

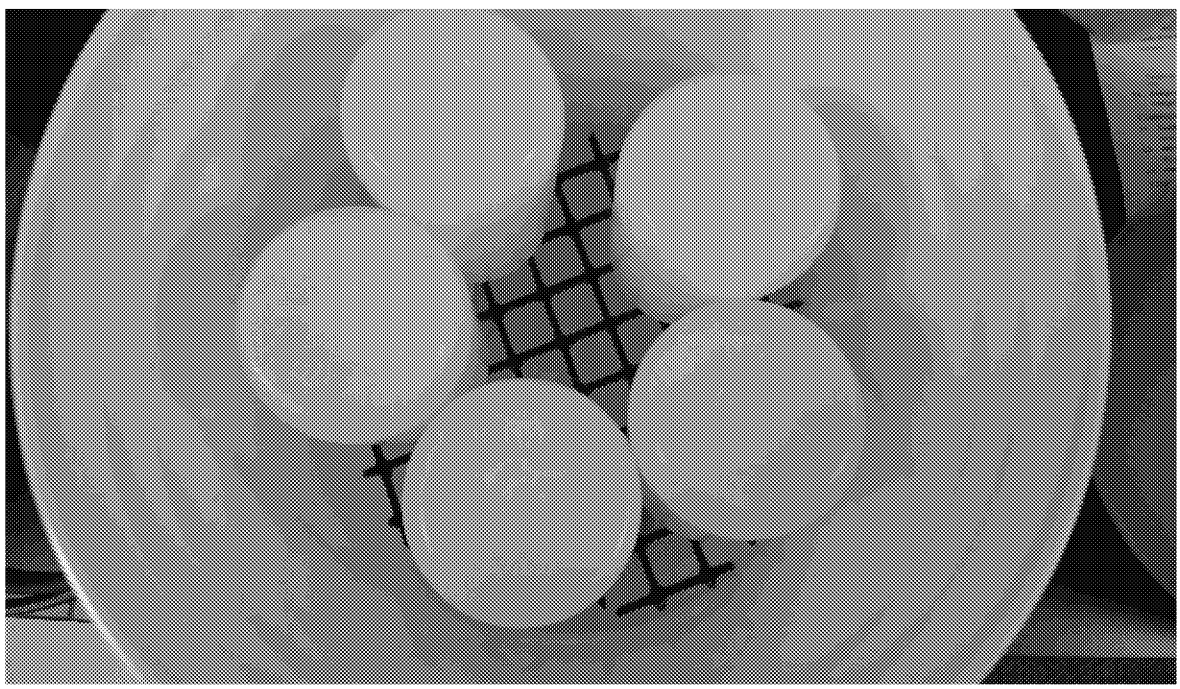
Notes:
µS/cm - microSiemens per centimeter
s.u. - standard units

Table S5
Laboratory PDS Testing: Mass of Analyte Bound to Mesh Over Time
Grants Reclamation Project

	Unused Mesh (baseline)		24 Hours		Week 1		Week 2		Week 4		Week 6		Week 8	
Analyte	Result (mg/kg)	Qualifier	Result (mg/kg)	Qualifier	Result (mg/kg)	Qualifier	Result (mg/kg)	Qualifier	Result (mg/kg)	Qualifier	Result (mg/kg)	Qualifier	Result (mg/kg)	Qualifier
Total Metals by USEPA Methods 3050B and then SW6010B for sodium and potassium, SW6020 for selenium and uranium (mg/L)														
Potassium	14		192		139		161	D	246	D	185		146	D
Selenium	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Sodium	298		299		285		317		1060	D	558		299	D
Uranium	1	U	3		3		4		6		4		3	

Notes:
D - sample was diluted by the analytical laboratory for quality control purposes.
mg/kg - milligram per kilogram
U - analyte was not detected above the method detection limit. The reporting limit is shown.
USEPA - United States Environmental Protection Agency

SUPPLEMENTARY INFORMATION FIGURES



EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

**LABORATORY PDS
TESTING SETUP**

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FIGURE
S1

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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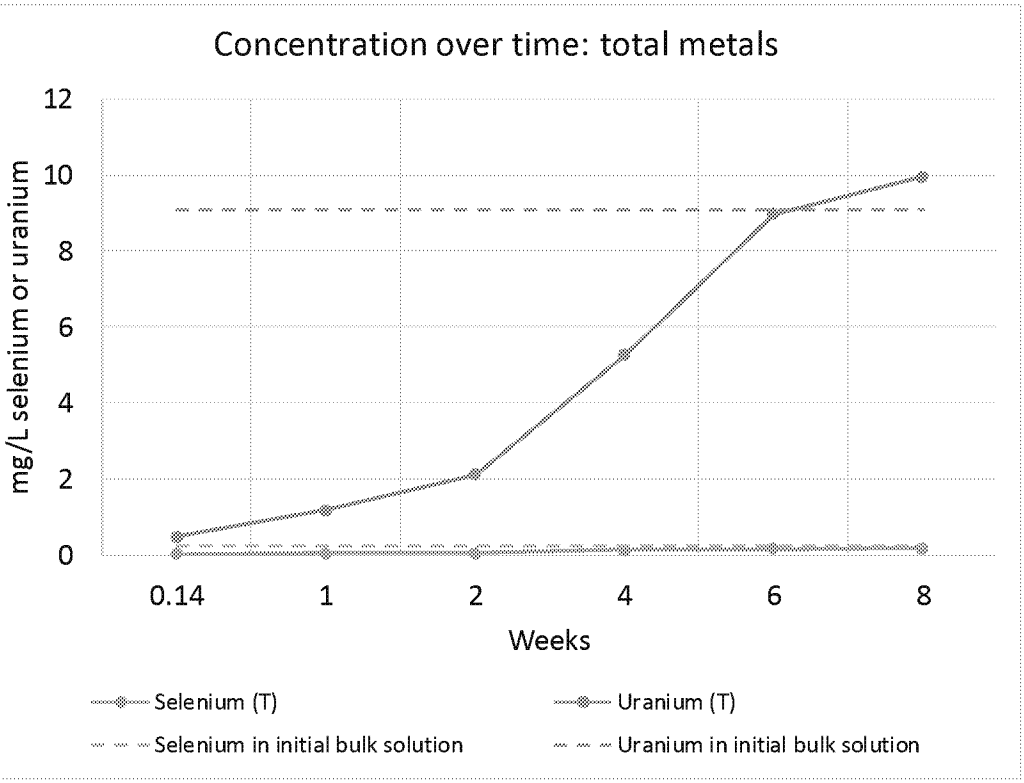

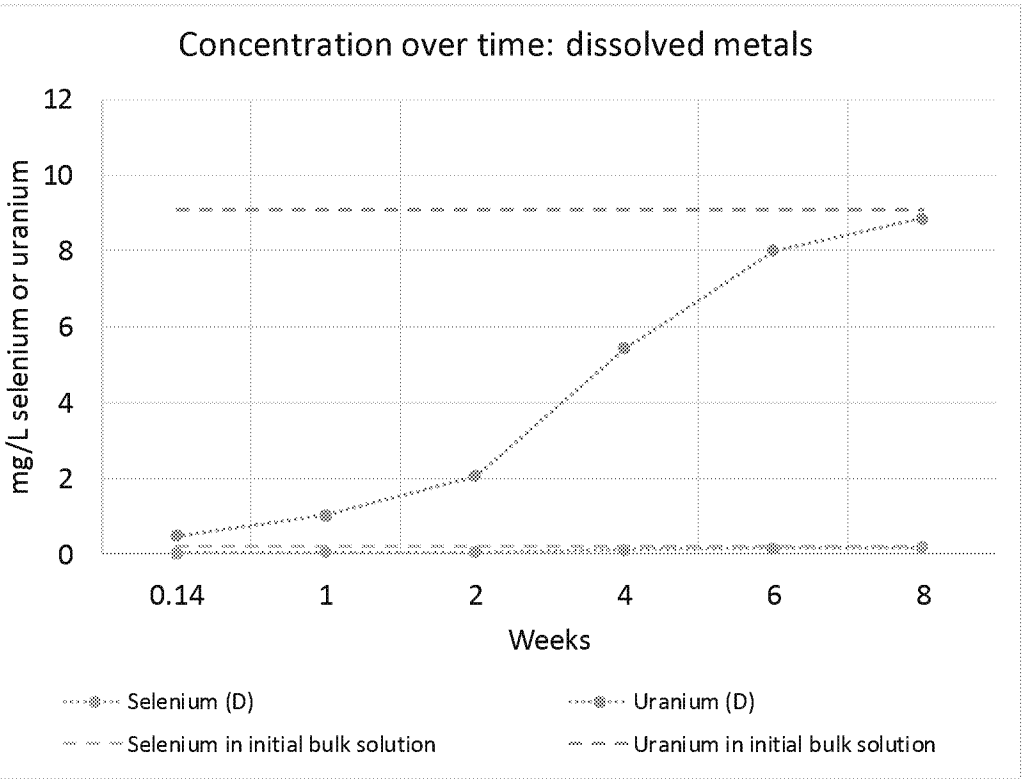

NOTES:

1. D = dissolved
2. mg/L = milligram per liter
3. T = total

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

LABORATORY PDS TESTING RESULTS: SELENIUM AND URANIUM CONCENTRATION OVER TIME

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FIGURE **S2**

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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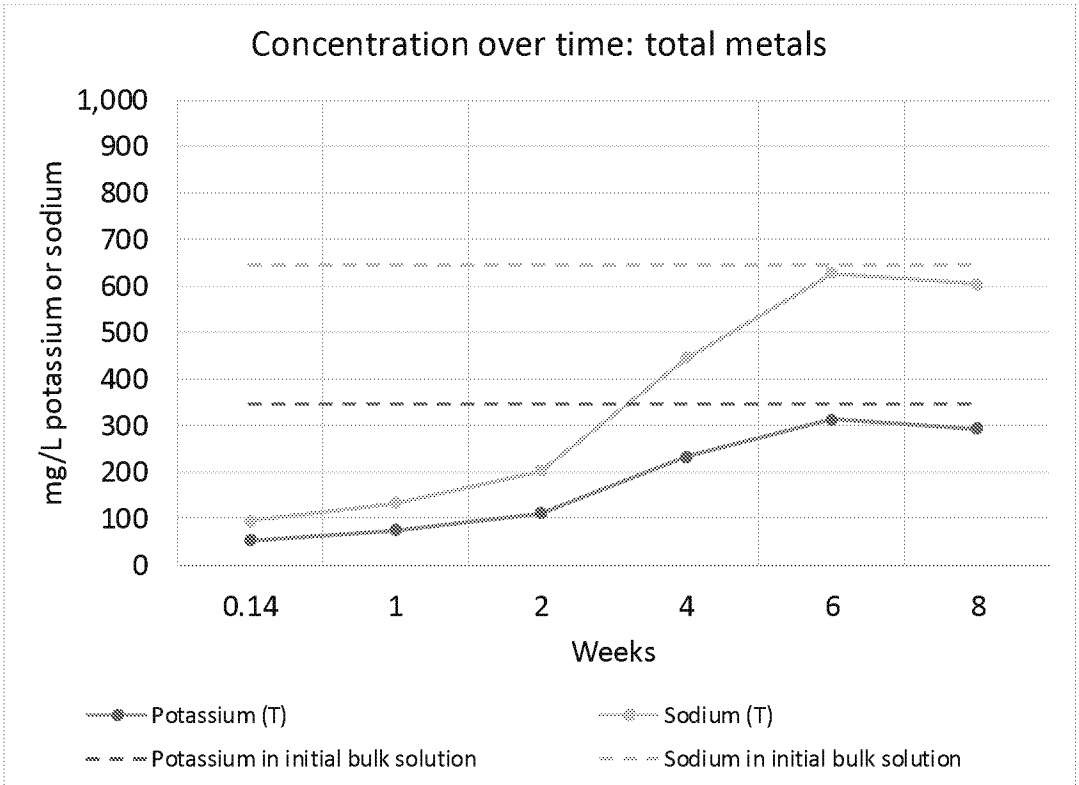

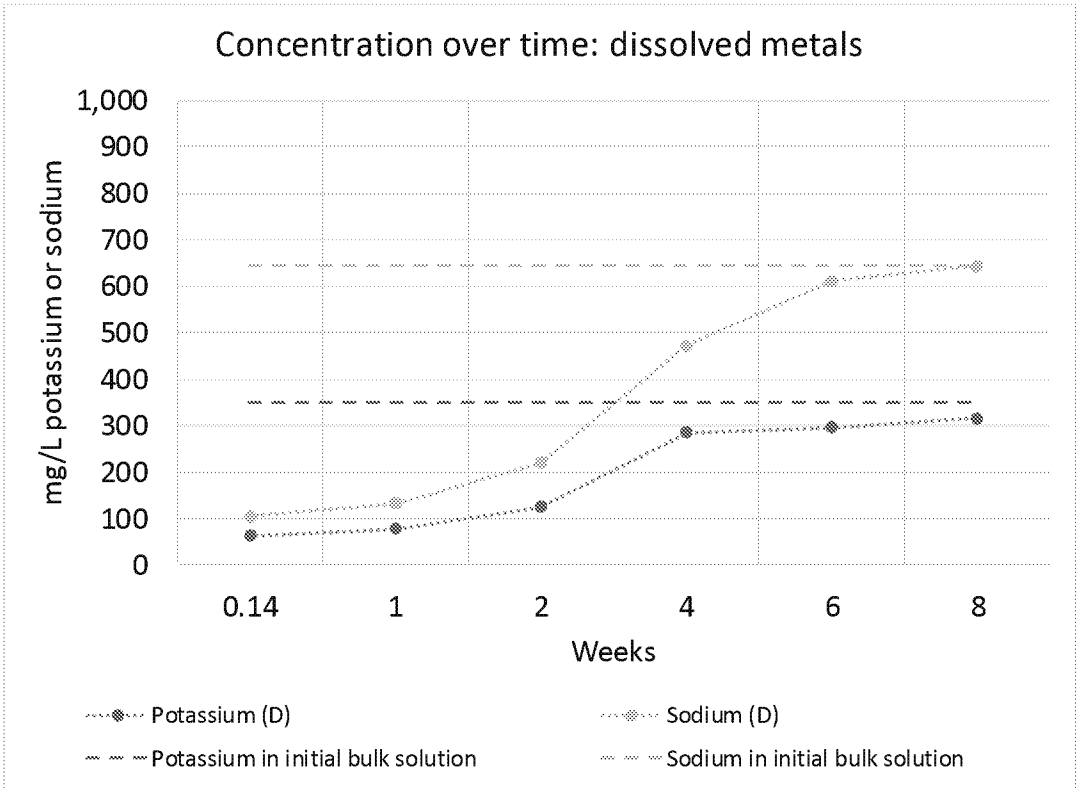

NOTES:

1. D = dissolved
2. mg/L = milligram per liter
3. T = total

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

**LABORATORY PDS TESTING RESULTS:
POTASSIUM AND SODIUM
CONCENTRATION OVER TIME**

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FIGURE
S3

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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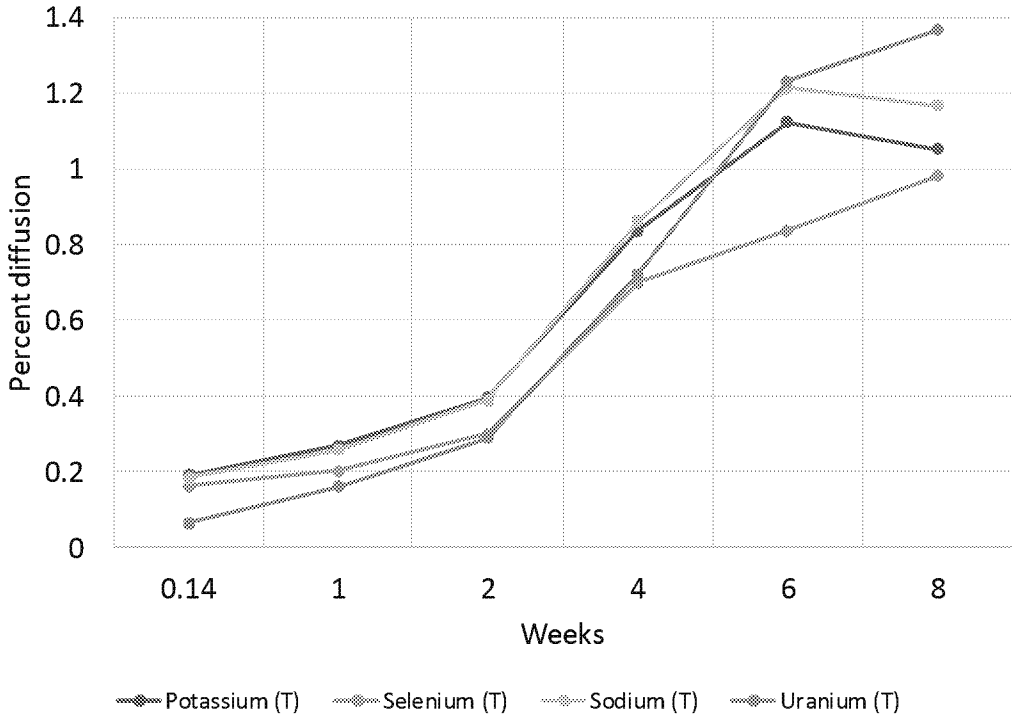

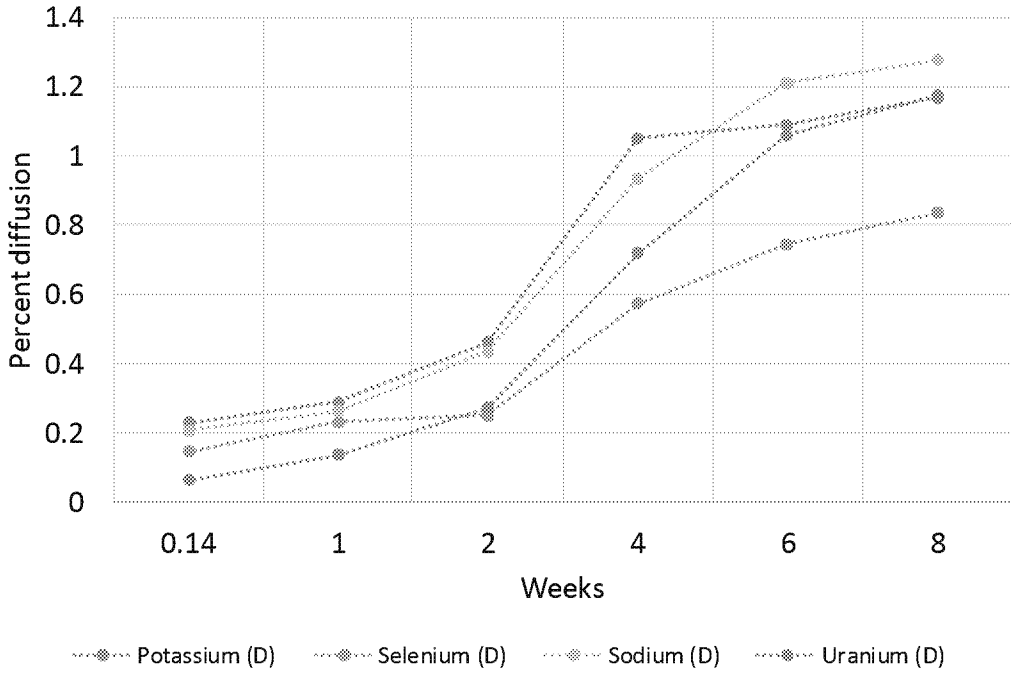

NOTES:

1. D = dissolved
2. T = total

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

LABORATORY PDS TESTING RESULTS: EQUILIBRATION OVER TIME - PERCENT DIFFUSION

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FIGURE **S4**

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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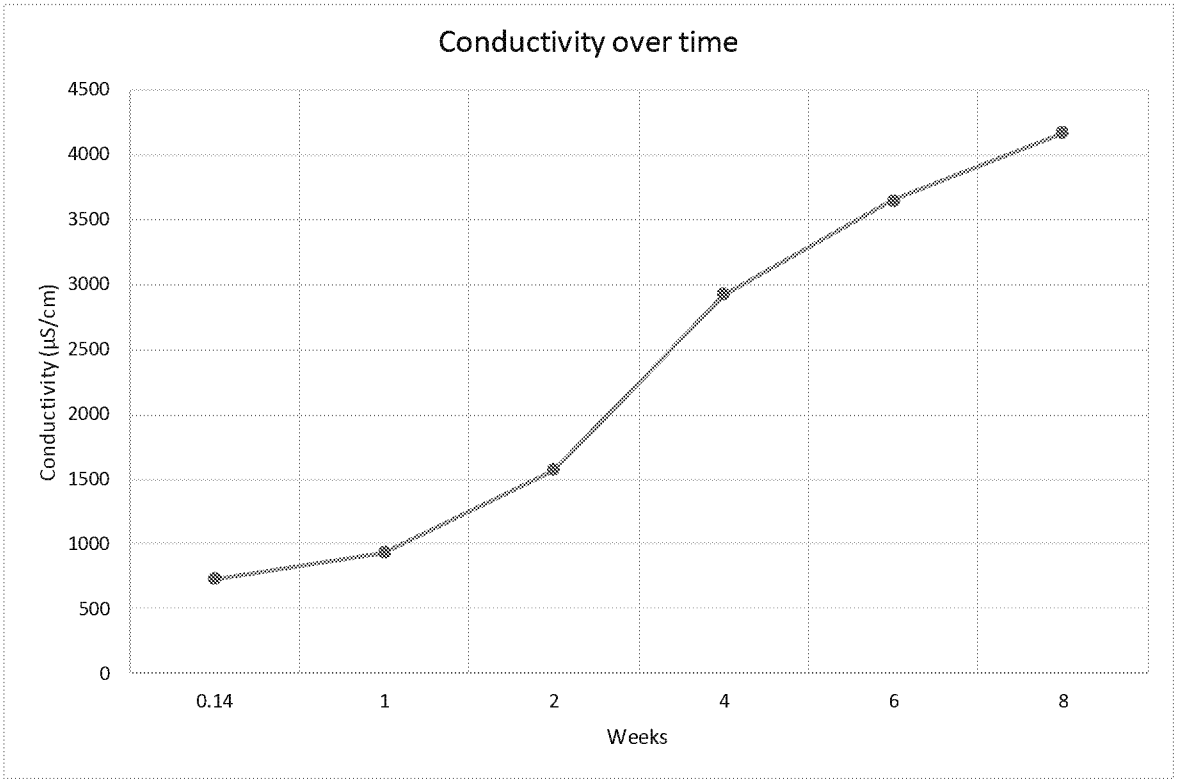

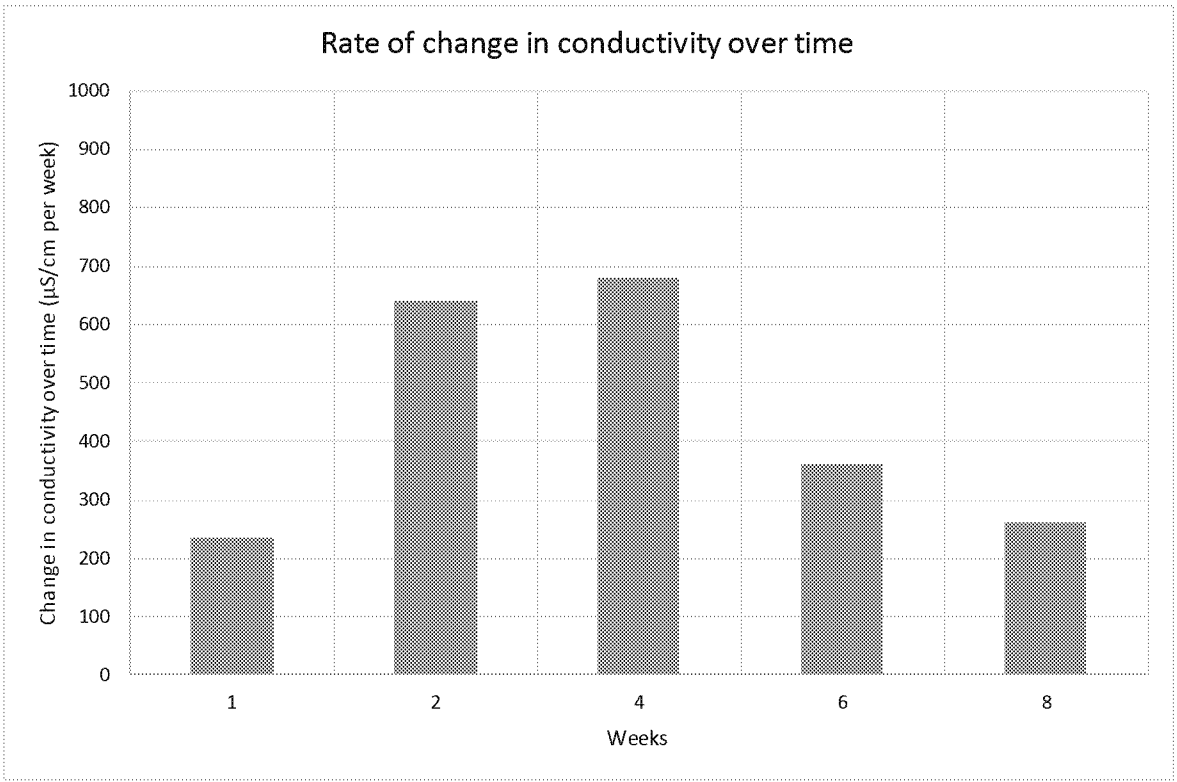

NOTES:

1. µS/cm = microSiemens per centimeter

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

**LABORATORY PDS TESTING RESULTS:
EQUILIBRATION OVER TIME -
CONDUCTIVITY**

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FIGURE
S5

City: DN/Group: Created By: Last Saved By: kkelley
Project (Project #)
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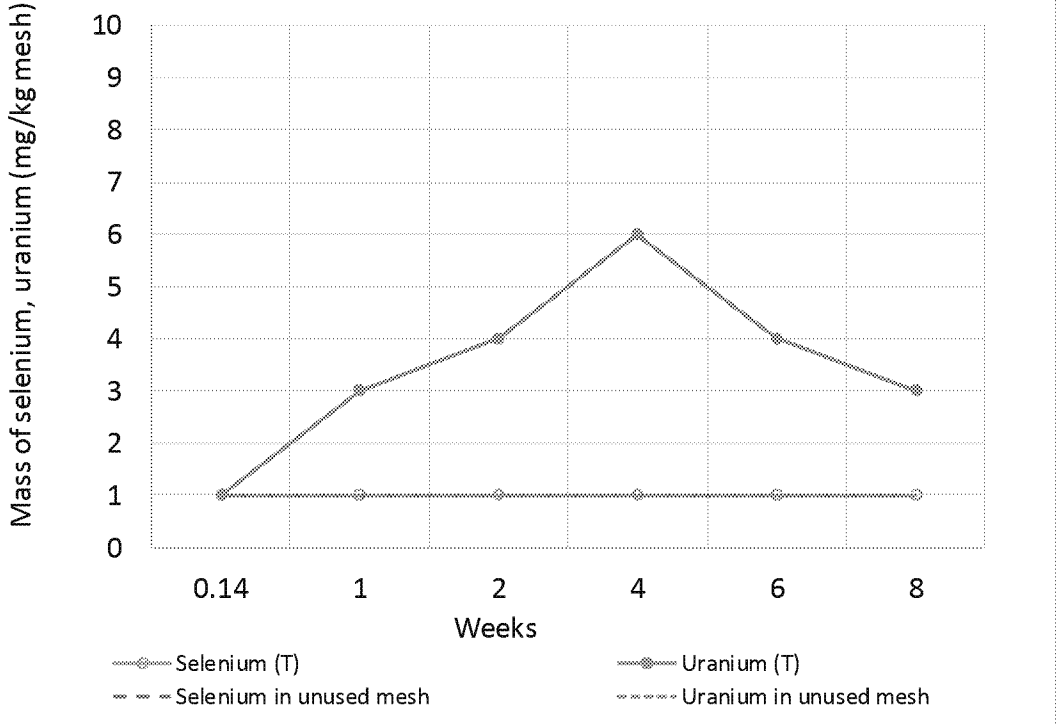

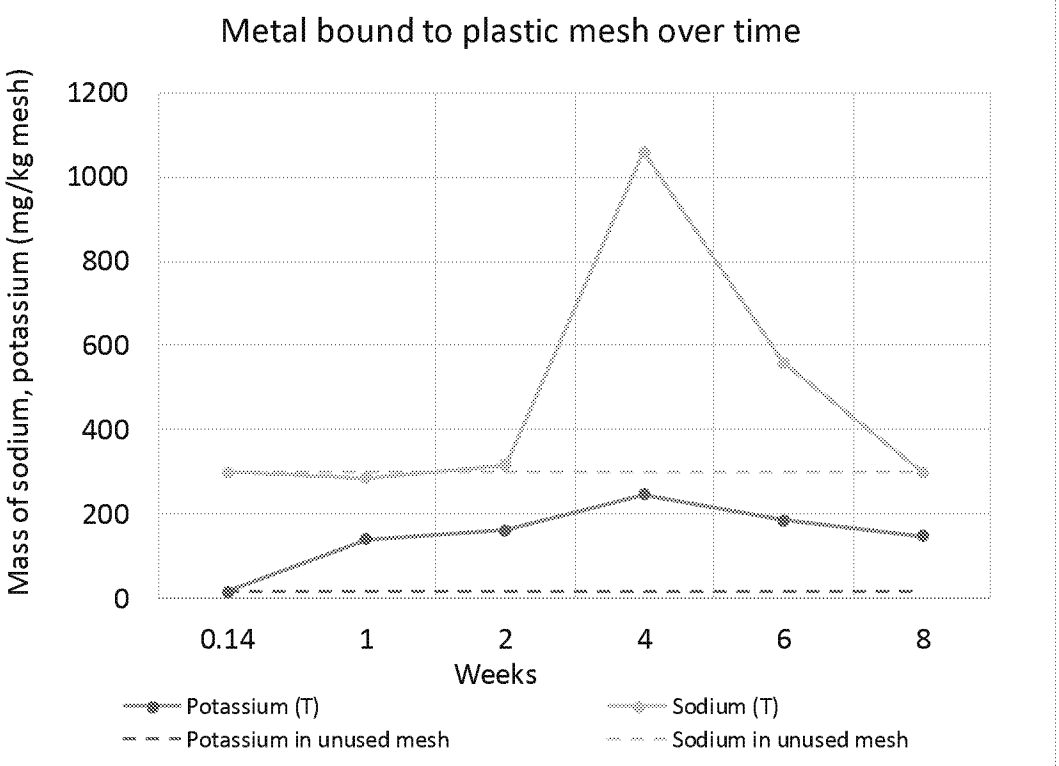

NOTES:

1. mg/kg = milligram per kilogram
2. T = total

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

**LABORATORY PDS TESTING RESULTS:
ANALYTES BOUND TO MESH OVER TIME**

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FIGURE
S6

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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Project (Project #)
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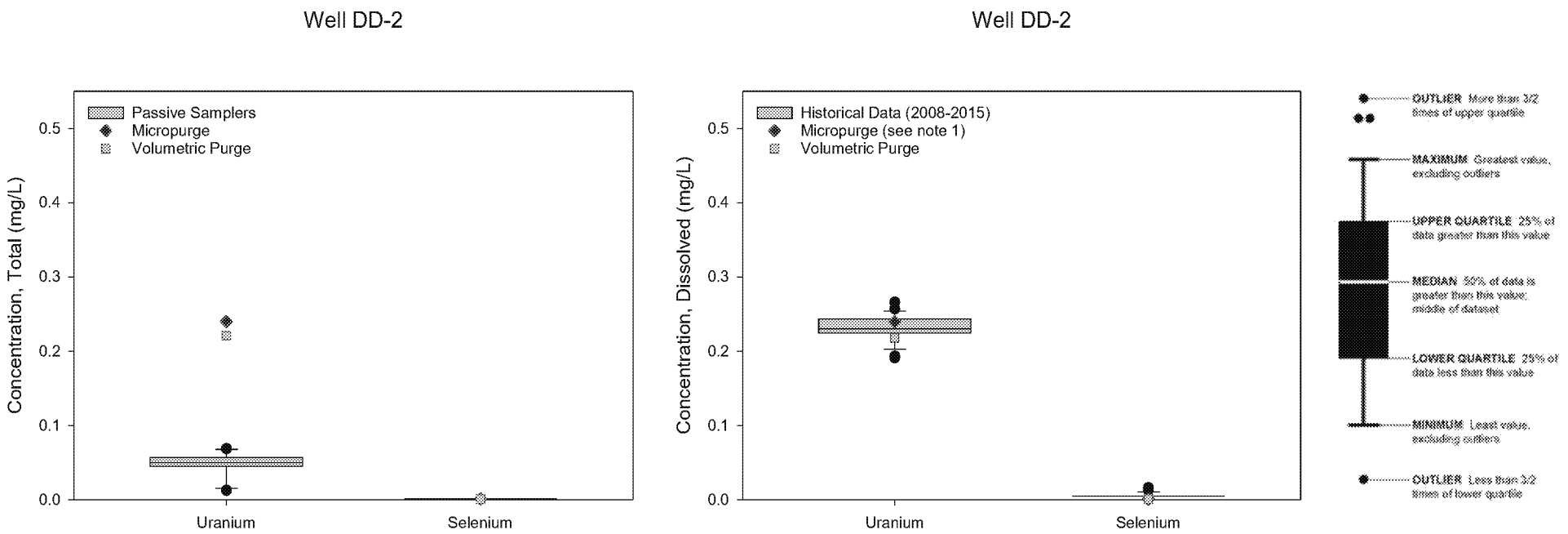

NOTES:

1. Micropurge concentrations are total metals, not dissolved.
2. mg/L = milligram per liter

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

2016 USGS SSE DATA FOR WELL DD2

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FIGURE
S7

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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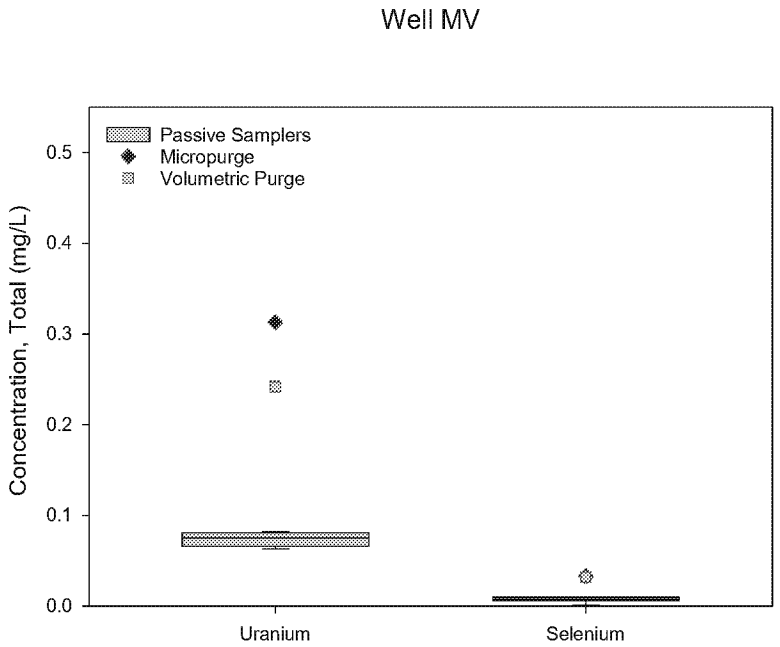

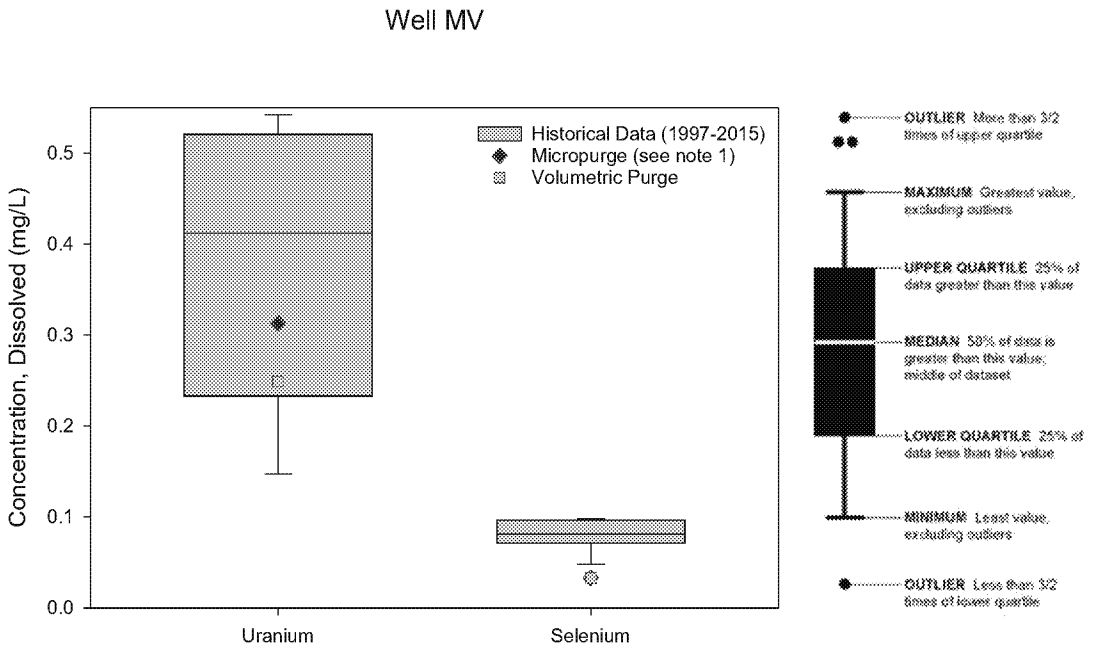

NOTES:

1. Micropurge concentrations are total metals, not dissolved.
2. mg/L = milligram per liter

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

2016 USGS SSE DATA FOR WELL MV

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FIGURE
S8

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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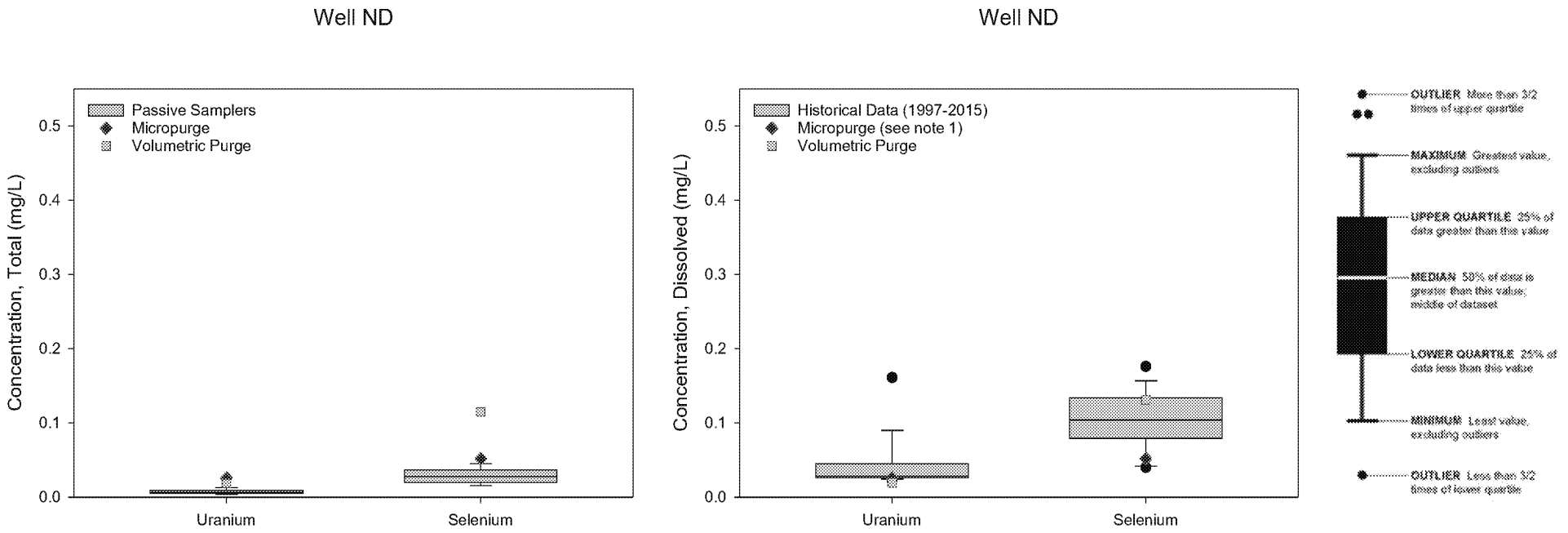

NOTES:

1. Micropurge concentrations are total metals, not dissolved.
2. mg/L = milligram per liter

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

2016 USGS SSE DATA FOR WELL ND

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FIGURE
S9

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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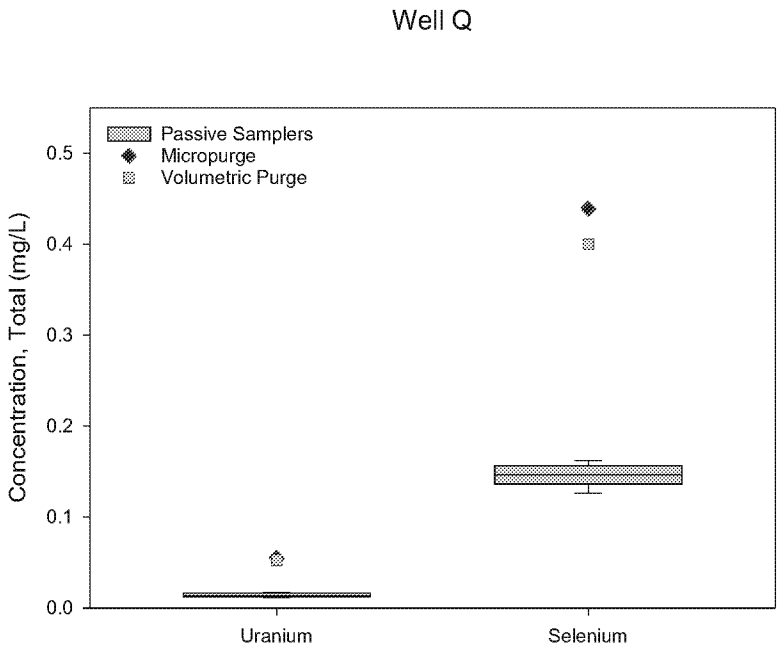

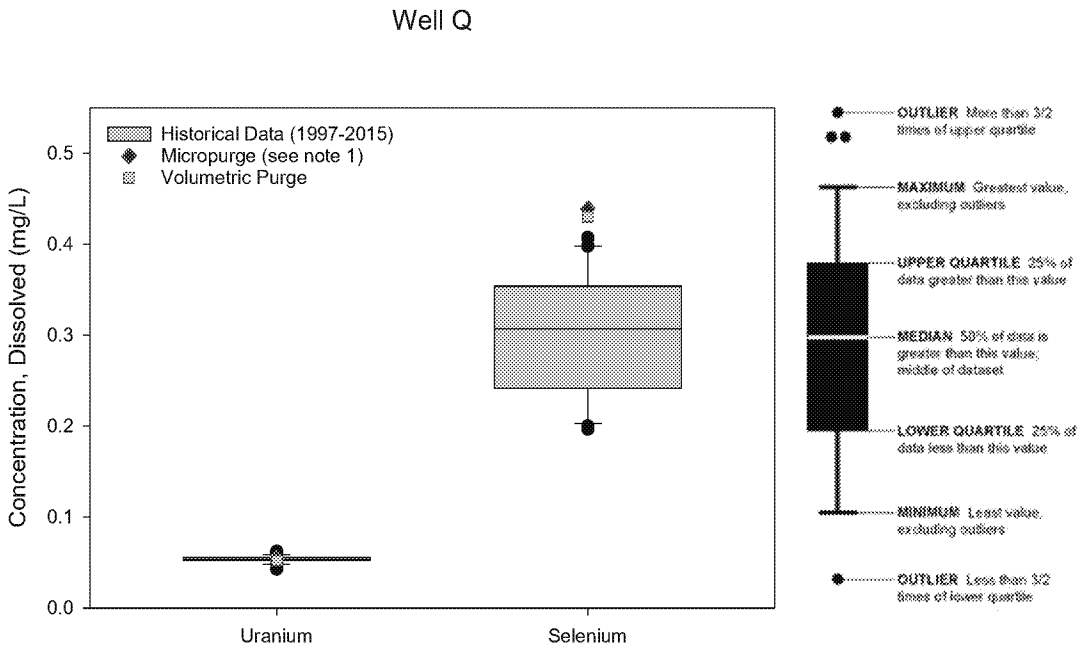

NOTES:

1. Micropurge concentrations are total metals, not dissolved.
2. mg/L = milligram per liter

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

2016 USGS SSE DATA FOR WELL Q

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FIGURE
S10

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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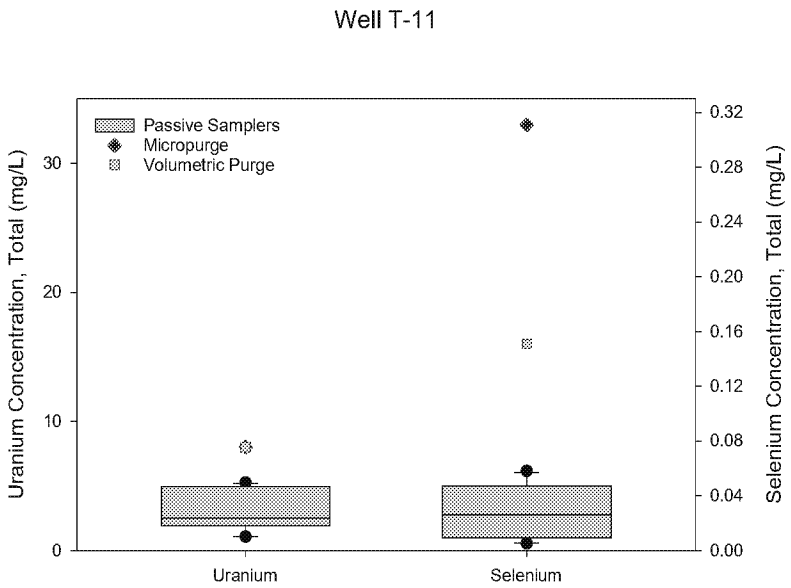

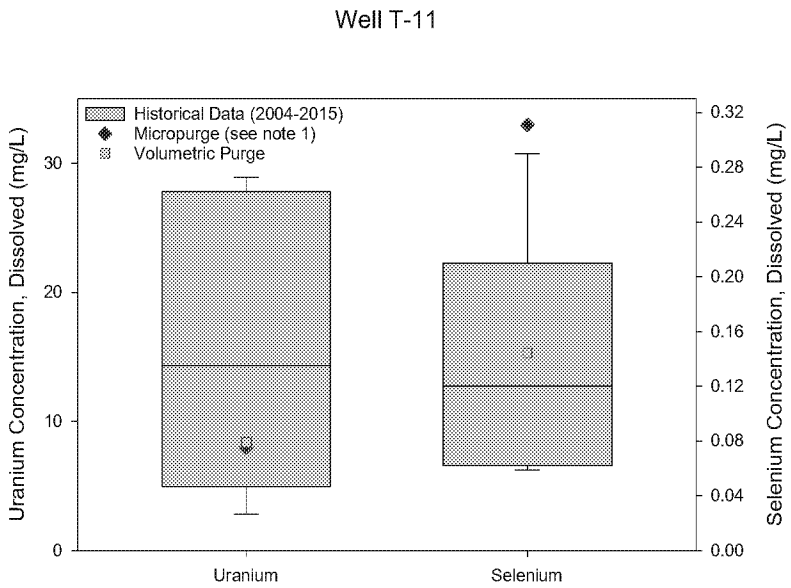

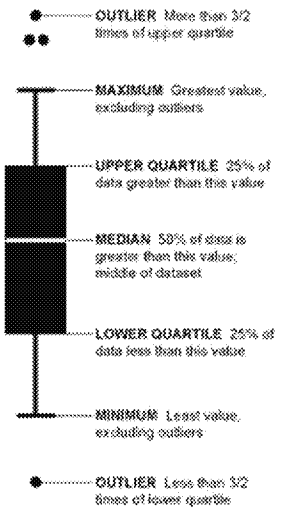

NOTES:
1. Micropurge concentrations are total metals, not dissolved.
2. mg/L = milligram per liter

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

2016 USGS SSE DATA FOR WELL T-11

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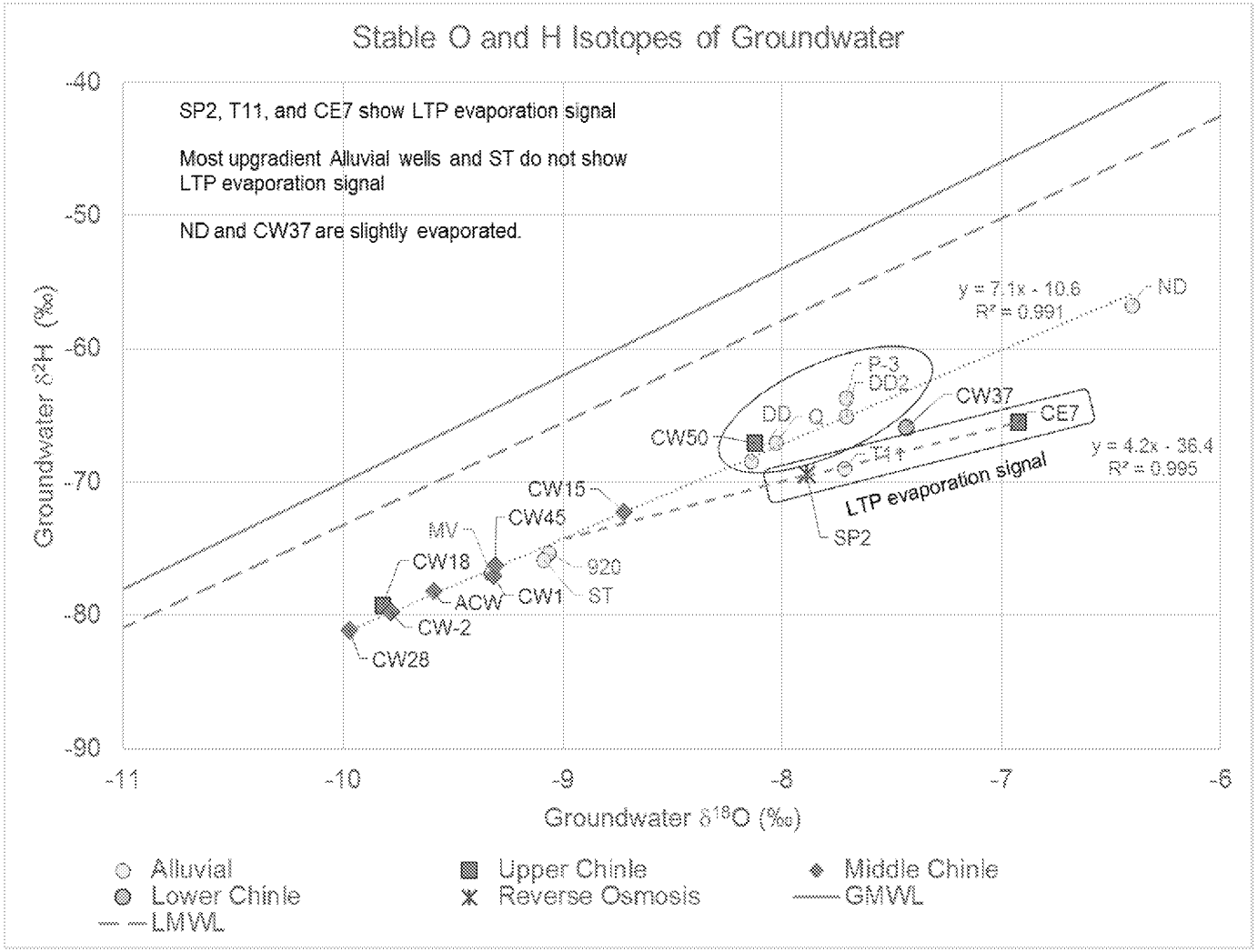
FIGURE
S11

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Constituents_in_GW_Upgradient_of_Grants_Uranium_Mill\ArcMaps\Fig_S12_Stable_Oxygen_and_Hydrogen_Isotopes_of_Water.mxd 9/18/2018 1:35:47 PM



NOTES:

1. ‰ = per mille
2. δ = delta, indicating a per mille enrichment or depletion of the isotope
3. GMWL = global meteoric water line
4. H = hydrogen
5. LMWL = local meteoric water line
6. LTP = Large Tailing Pile
7. O = oxygen

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

STABLE OXYGEN AND HYDROGEN ISOTOPES OF WATER

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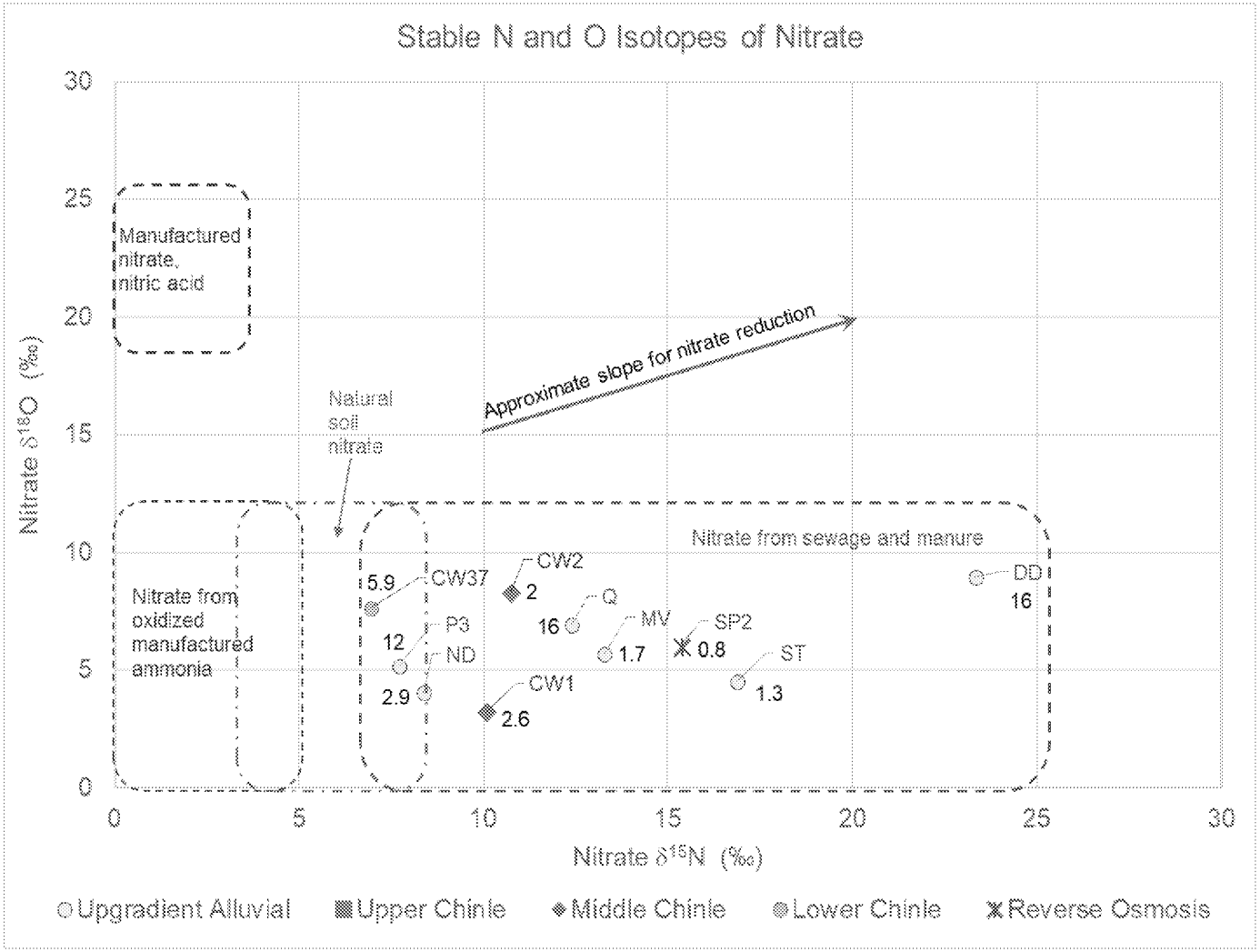
FIGURE **S12**

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Constituents_in_GW_Upgradient_of_Grants_Uranium_Mill\ArcMaps\Fig_S13_Stable_Oxygen_and_Nitrogen_Isotopes_of_Nitrate.mxd 9/18/2018 1:37:27 PM



NOTES:

1. ‰ = per mille
2. δ = delta, indicating a per mille enrichment or depletion of the isotope
3. N = nitrogen
4. O = oxygen
5. Approximate boundaries of isotopic signatures of common nitrate sources are shown

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

STABLE OXYGEN AND NITROGEN ISOTOPES OF NITRATE

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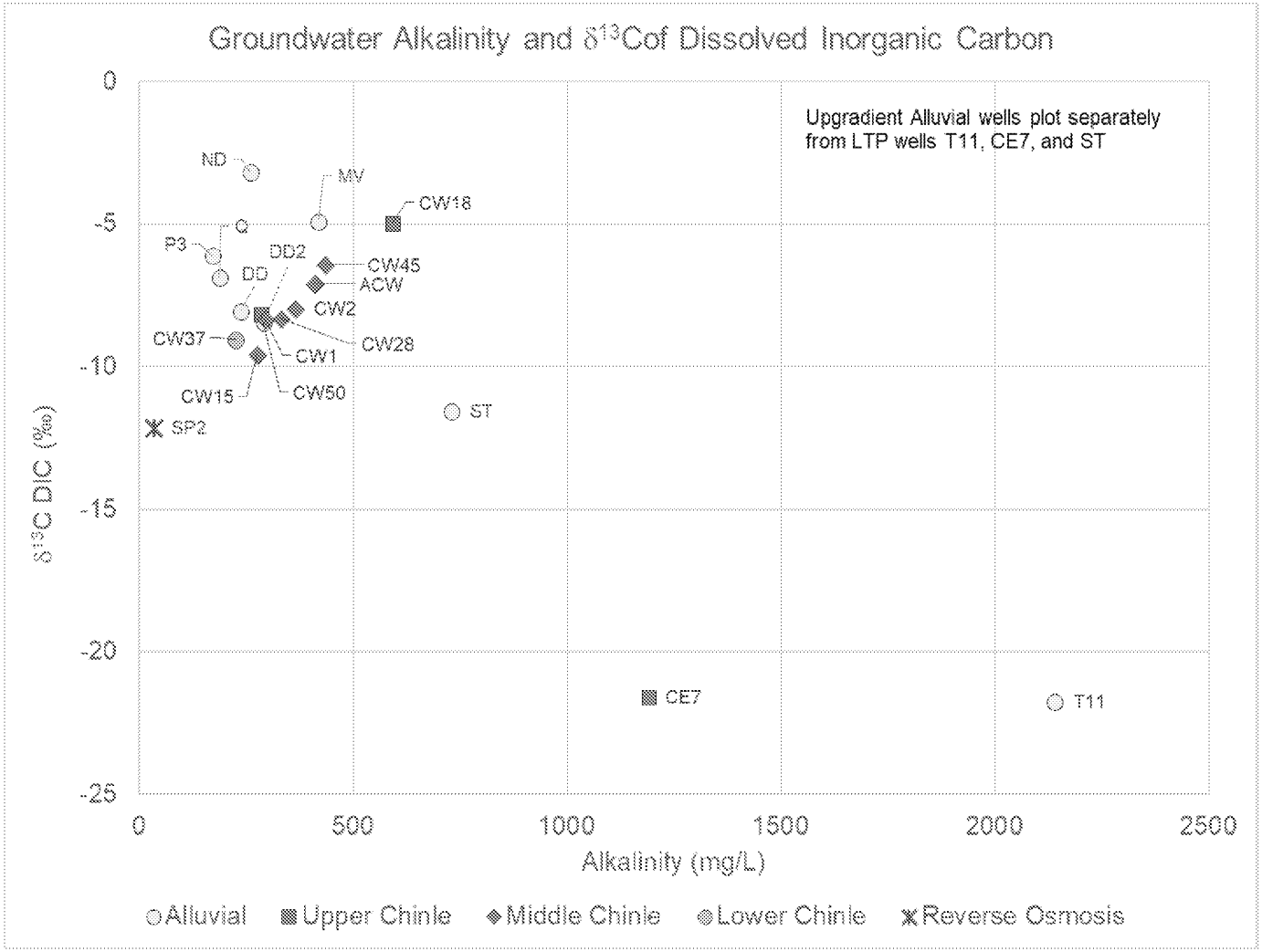
FIGURE
S13

ED_004985_00011411-00143

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Constituents_in_GW_Upgradient_of_Grants_Uranium_Mill\ArcMaps\Fig_S14_Alkalinity_and_Stable_Carbon_Isotopes_of_Dissolved_Inorganic_Carbon.mxd 9/18/2018 1:42:55 PM



NOTES:

1. ‰ = per mille
2. δ = delta, indicating a per mille enrichment or depletion of the isotope
3. C = carbon
4. DIC = dissolved inorganic carbon
5. mg/L = milligram per liter

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

ALKALINITY AND STABLE CARBON ISOTOPES OF DISSOLVED INORGANIC CARBON

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FIGURE **S14**

ED_004985_00011411-00144

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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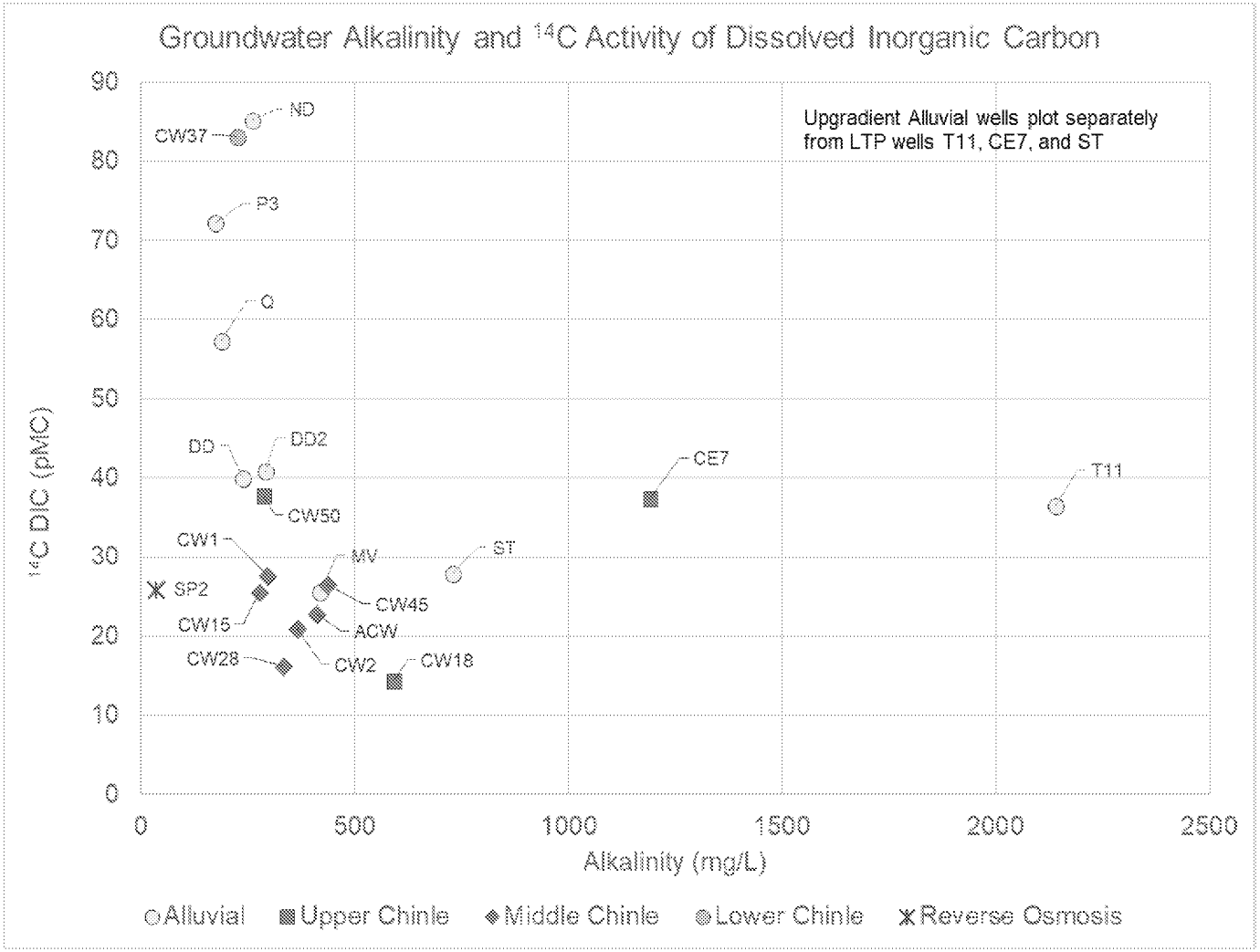

NOTES:

1. C = carbon
2. DIC = dissolved inorganic carbon
3. LTP = Large Tailing Pile
4. mg/L = milligram per liter
5. pMC = percent modern carbon

EVALUATION OF WATER QUALITY IN REGARD TO SITE BACKGROUND STANDARDS AT THE GRANTS RECLAMATION PROJECT

CARBON-14 OF DISSOLVED INORGANIC CARBON

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FIGURE **S15**

ED_004985_00011411-00145

City: Div/Group: Created By: Last Saved By: kkelley
Project (Project #)
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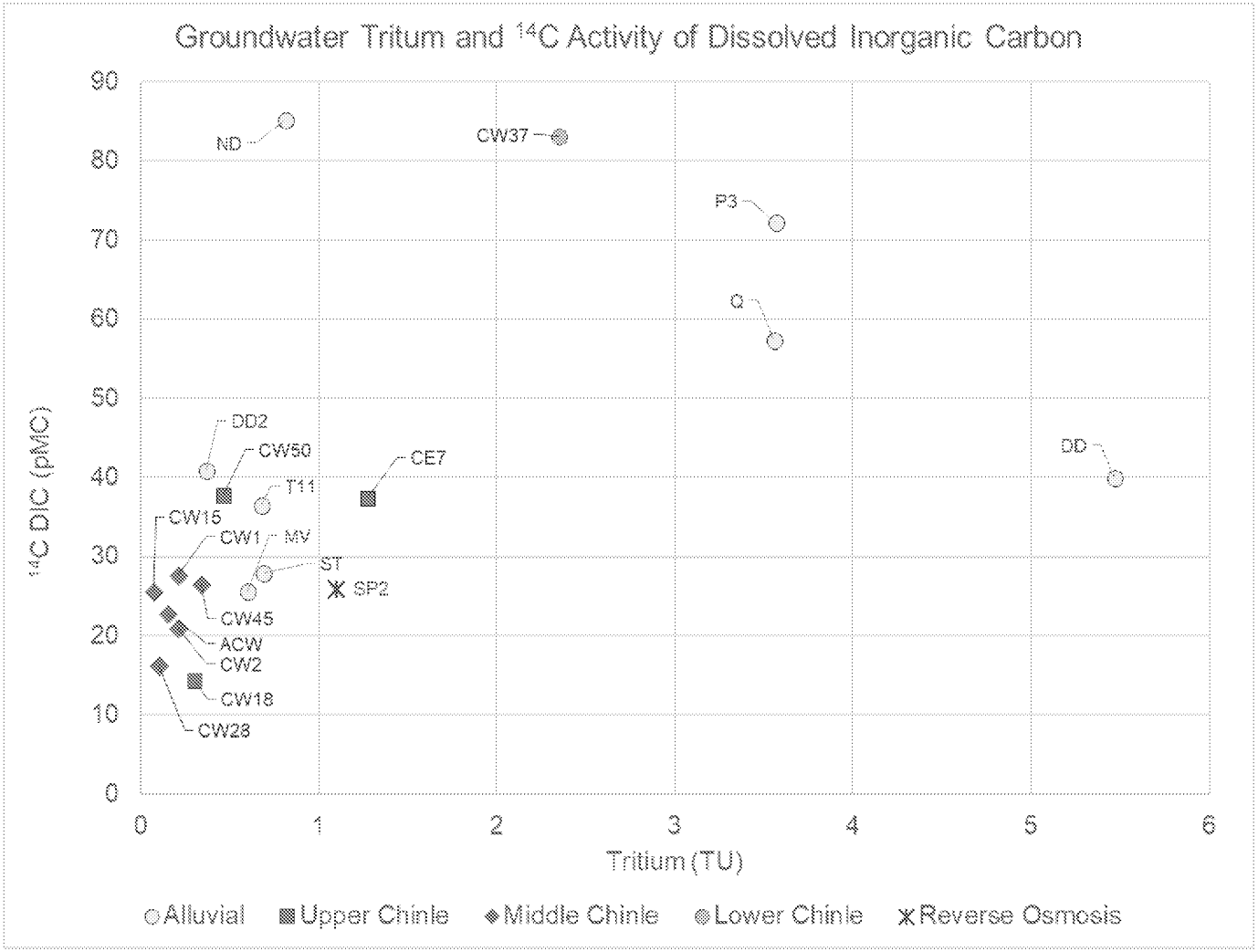

NOTES:

1. C = carbon
2. DIC = dissolved inorganic carbon
3. pMC = percent modern carbon
4. TU = tritium units

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

TRITIUM IN GROUNDWATER

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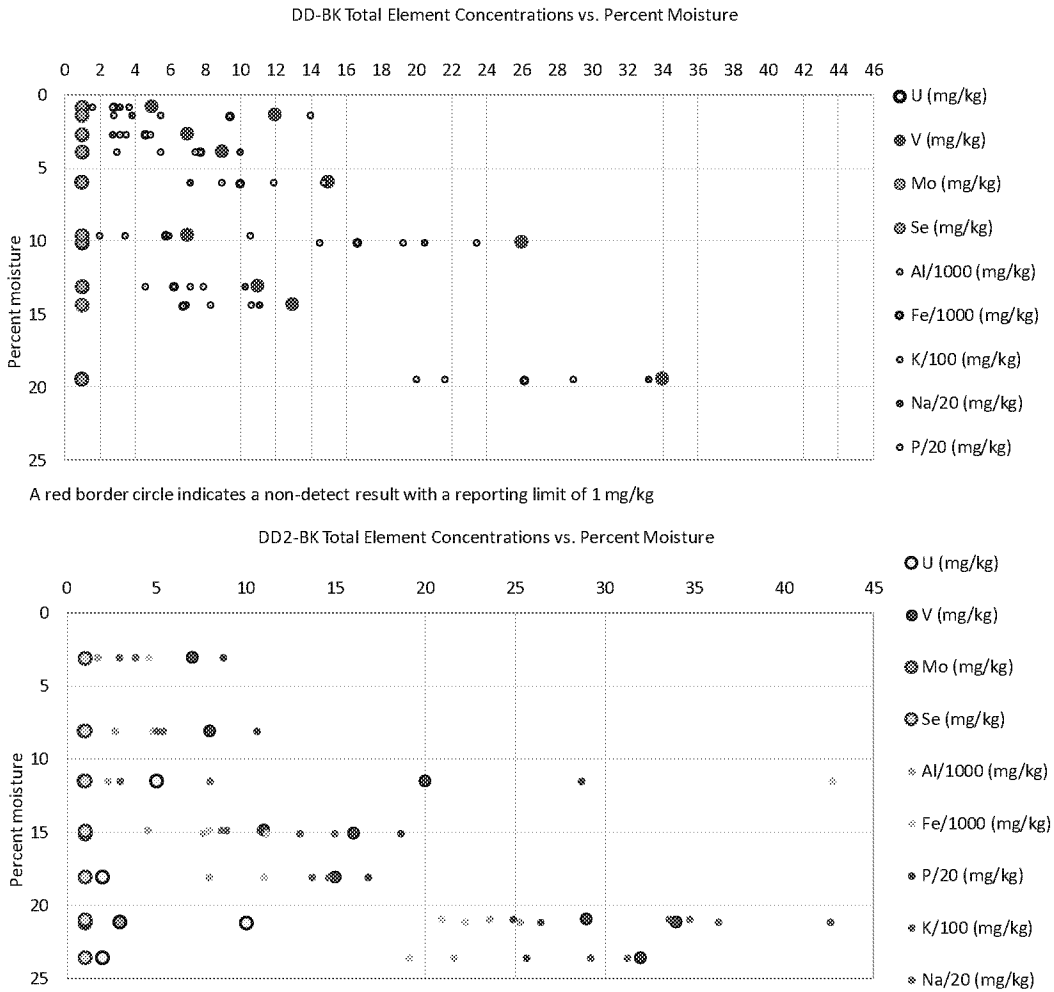
FIGURE
S16



NOTES:

1. mg/kg = milligram per kilogram
2. Al = aluminum
3. Fe = iron
4. K = potassium
5. Mo = molybdenum
6. Na = sodium
7. P = phosphorus
8. Se = selenium
9. U = uranium
10. V = vanadium

EVALUATION OF WATER QUALITY IN
REGARD TO SITE BACKGROUND STANDARDS
AT THE GRANTS RECLAMATION PROJECT

2018 SOIL INVESTIGATION
TOTAL METALS VS. PERCENT MOISTURE

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FIGURE
S17

APPENDIX A
Summary of USGS/EPA Geophysical Logging and Passive Sampler Deployment Field Events, Grants Reclamation Project

MEMO

ARCADIS Design & Consultancy for natural and built assets

To:
Jesse Toepfer
Homestake Mining Company

Copies:
Phil DeDycker
Jeff Gillow
Anna Hagemeister

Arcadis U.S., Inc.
630 Plaza Drive
Suite 100
Highlands Ranch
Colorado 80129
Tel 720 344 3500
Fax 720 344 3535

From:
Brad Cross
Patsy Moran
Joe Gilbert

Date:
September 12, 2016

Arcadis Project No.:
AO000120.007E

Subject:

Summary of USGS/EPA Geophysical Logging and Passive Sampler Deployment Field Events, Grants Reclamation Project

INTRODUCTION

The United States Environmental Protection Agency (EPA) Region 6 and the United States Geological Survey (USGS) intend to gather data in support of a background groundwater reassessment for the Grants Reclamation Project as described in the EPA letter dated April 19, 2016 and subsequent Quality Assurance Project Plan dated July 26, 2016 (USGS 2016). Data are being gathered during multiple field events:

1. An information gathering and well inspection site visit conducted on May 17 and May 18, 2016. The results of this site visit were summarized in a technical memorandum provided by Arcadis U.S., Inc. (Arcadis) dated May 23, 2016 (Arcadis 2016).
2. A geophysical logging event conducted from August 8 through August 13, 2016, discussed below.
3. Installation of passive samplers on August 30 and August 31, 2016, discussed below.
4. Retrieval of passive samplers and additional sampling of select groundwater wells, scheduled for the week of October 3, 2016.

At the request of Homestake Mining Company of California (HMC), Arcadis staff were and will be in attendance for all field events. The purpose of this technical memorandum is to summarize observations during the geophysical logging and passive sampler events conducted by EPA and USGS.

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EVENT #2 OVERVIEW – GEOPHYSICAL LOGGING

Personnel in attendance from EPA and USGS included:

- Sai Appaji, EPA Region 6
- Kent Becher, USGS, Fort Worth Texas Water Science Center
- John Thomas, USGS, Geophysicist

The EPA/USGS objective of the geophysical logging event was to collect borehole geophysical data logs from seven monitoring wells completed in the alluvial aquifer (DD, DD-2, MV, ND, Q, T-11, and n-17) to assist in the reassessment of background concentrations for uranium at the HMC site. The suite of borehole geophysical logging data proposed included measurements using a caliper, natural gamma (run on a multi-tool string), induction, spectral gamma, optical televiewer, and electromagnetic (EM) flowmeter, as well as fluid temperature and conductivity. The primary uses for each logging tool/measurement and their limitations are discussed below:

- A ***caliper*** is a mechanical tool that measures inner casing diameter and total depth, and can detect changes, or the presence of obstructions, in the well casing or borehole.
- ***Natural gamma*** is used to obtain lithology and stratigraphy/hydrostratigraphy data and to detect the presence of high gamma emitters (e.g., uranium). Natural gamma passively detects gamma particles emanating from a source and is impacted by distance from the source (greater distance results in lower counts). Fined-grained sediments generally result in higher gamma counts due to the mineralogy of clays, although coarse sediments with abundant orthoclase (potassium feldspar) can result in high gamma counts. Borehole/well diameter will affect results due to the distance of the tool detector from native soils. The presence of bentonite in the annular well seal can also affect results.
- ***Induction*** is used to obtain lithology and stratigraphy/hydrostratigraphy data and pore fluid characteristics (e.g., total dissolved solids [TDS]). Clay minerals are generally more highly conductive than sandy material. High TDS in pore fluids will make sandy sediments more conductive. Induction is generally used in polyvinyl chloride (PVC) cased wells because it can measure beyond the casing and borehole zone. The presence of metallic materials in the well (e.g., centralizers) or in soils will affect results.
- ***Spectral gamma*** is used to measure concentrations of specific gamma emitters including radioactive isotopes of thorium, uranium, and potassium. Similar qualities/limitations exist as for natural gamma.
- An ***optical televiewer*** provides visual images used to assess the total depth of a well, depth and condition of the screened casing, condition of the blank casing, and turbidity of fluid in the well (qualitative). Excess turbidity in well water will reduce visibility of well features. This tool is also used in open boreholes for geologic interpretation.
- An ***EM flowmeter*** is used to assess vertical groundwater gradients and relative, interval-specific fluid yield based on changes in groundwater flow into or out of a borehole or across the screened interval of cased wells under both ambient (natural) and stressed (pumping) conditions. In cased wells, borehole diameter and annular fill can affect results, as can the condition of the well screen or the presence of breaches in the blank casing. Under pumping conditions, variability in pumping rates will affect results.

- ***Fluid temperature and conductivity*** measurements are used to assess groundwater properties (e.g., TDS) and to process other tool data. The data can also be used to assess changes in measured parameters related to depth/hydrostratigraphic intervals assuming mixing of well fluids within the well column is minimal.

The monitoring wells logged during this event included:

- DD, located northwest of the LTP
- DD-2, located northwest of the LTP in proximity to well DD
- MV, located southwest of the LTP
- ND, located northeast of the LTP
- Q, located north of the LTP
- T-11, located on top of and in the northwestern portion of the LTP

One other proposed well, N-17, was not logged due to weather delays and well construction/access issues.

During the field event, the following were collected/prepared by EPA/USGS and/or Arcadis:

- Photographs
- Well construction specifics including measuring point (MP) elevation above ground surface (stick-up), and casing outer diameter (OD) and inner diameter (ID)
- Static depth to groundwater and drawdown and recovery water levels during the pumping stage of EM flowmeter logging
- Preliminary (pre-processed) borehole geophysical logs (Arcadis staff collected photographs of the preliminary logging results from the computer screen in the logging truck whenever possible. Spectral gamma and flowmeter results were often difficult to photograph because the USGS geophysicist cleared the screen and initiated depth-specific station measurements immediately following those logging runs).
- Handwritten notes that, at a minimum, included observations on logging procedures and initial observations regarding the response of the geophysical tools and implications to the investigation being conducted

Two senior-level staff from Arcadis were in attendance:

- Patsy Moran, Geochemistry/Project Technical Lead
- Brad Cross, Geophysics

Based on discussions with HMC, the objectives of the Arcadis personnel included:

- Engage EPA/USGS staff and ask questions regarding specific activities during geophysical logging
- Observe activities and record observations on procedures and methods
- Avoid providing detailed information when asked and avoid assisting in data acquisition activities

A summary of the oversight activities is provided below. The Arcadis photographic log is provided in Attachment 1. Attachment 2 is a compilation of daily geophysical logging field forms. The wells subjected to geophysical logging by USGS/EPA and passive sampler deployment as well as the wells that will be sampled during the event scheduled for the week of October 3, 2016 are shown on Figure 1.

Summary of Activities – Geophysical Logging

Date: Monday, August 8, 2016

Arcadis staff arrived at the HMC office at 0720 followed by USGS staff at 0750. Following introductions, a health and safety tailgate briefing was conducted, focusing on the weather and driving in muddy conditions. Specifically, there had been heavy rain in the area over the previous few days and the potential to get stuck while driving had increased significantly. The HMC requirement to stop work when lightning is observed was discussed (30-minute stop-work requirement when lightning is visible). HMC conducted a field-level risk assessment (FLRA) and discussed the risks (e.g., weather, slips/trips/falls, snakes/ants/prairie dog holes) and mitigation associated with the tasks being conducted. HMC/USGS acknowledged the need to walk around rather than under the truck boom and to talk to Kent Becher rather than John Thomas while conducting logging activities.

USGS personnel unloaded their trailer and prepared for the day's activities, realizing they had left some key equipment at the hotel. They left the site at 0930 to retrieve the equipment and returned to the site at 1020. Due to rain and lightning in the area, a weather stop work order was issued until 1045. An attempt to mobilize to well ND was thwarted when the USGS trailer got stuck in mud and HMC staff had to pull out the trailer using a front-loader tractor. A decision was made to mobilize to well MV instead; however, nearby lightning strikes resulted in a stop work order being issued before personnel had arrived at the well and all personnel returned to the office.

At 1250, Sai Appaji (EPA) arrived on site. USGS then conducted decontamination of the geophysical tools. Arcadis staff noted that during decontamination activities, the tools were removed from their containers, rinsed with Liquinox® followed by deionized (DI) water, wiped with a paper towel, and then placed back in the containers without a sleeve or other protection against subsequent contamination. USGS then continued to prepare for logging activities, including preparations for EM flowmeter setup and monitoring of flow rates under pumping conditions.

All field personnel mobilized to well MV at 1510, and USGS collected water level measurements and prepared to conduct caliper tool logging when lightning was observed nearby, resulting in a stop work order being issued just prior to the caliper run. USGS asked permission to complete the caliper run since it would only take a few minutes, and HMC personnel agreed. It was somewhat unclear whether EPA/USGS personnel are required to follow HMC rules, but prior to this interaction they had done so throughout the day (e.g., Sai Appaji requested a hard hat and vest after learning they were HMC-required personal protective equipment). Logging was completed at 1603 while the storm was rapidly approaching. Following the caliper logging run, USGS personnel decontaminated the caliper tool using a Liquinox® rinse and DI rinse and the tool was returned to its container. The wireline cable was then decontaminated using a DI rinse and wiped down with a paper towel.

All field personnel demobilized and returned to the HMC office at 1615. EPA and USGS personnel left the site at 1620. Arcadis staff met briefly with HMC personnel and left a telephone message for Jesse Toepfer before leaving the site at 1635.

Date: Tuesday, August 9, 2016

Arcadis staff arrived on site at 0610 and conducted a tailgate meeting that focused on the weather and driving in muddy conditions since rain was expected. Various physical (e.g., uneven footing) and biological hazards were also discussed. All field personnel remobilized to well MV at 0650 to complete the borehole geophysical logging at that location. Logging activities took place in the following order: multi-tool for natural gamma (other geophysical measurements can be made with the multi-tool but it is not intended for use in cased wells), induction, spectral gamma, optical televiewer, and fluid temperature and conductivity. Each logging run was conducted from the total depth (TD) of the well to surface, with the exception of spectral gamma, which was logged from TD to 5 feet (ft) above the top of the screened interval. No EM flowmeter logging was conducted at well MV.

Following each logging run, USGS personnel decontaminated the geophysical tools with a Liquinox® rinse and DI rinse, and the tools were then placed back in the containers. Upon completion of the fluid temperature and conductivity logging run and decontamination of the tool, an equipment blank was collected. The wireline cable was then decontaminated using a DI rinse and wiped down with a paper towel. Activities at well MV were completed by 0955 and all field personnel returned to the HMC office by 1030.

USGS personnel mobilized to well ND at 1105. Well ND logging activities took place in the following order: caliper, multi-tool for natural gamma, induction, optical televiewer, spectral gamma, fluid temperature and conductivity, and EM flowmeter. Each logging run was conducted from the TD of the well to surface, with the exception of spectral gamma and EM flowmeter logging. Spectral gamma was logged from TD to 10 ft above the top of the screened interval at 31.5 ft. EM flowmeter logging included ambient trolling down, ambient trolling up, pumping, and depth-specific station measurements within the screened interval of the well. For the pumping flowmeter logging run, the pump had to be positioned 8.5 ft below the top of the screened interval to allow for drawdown in the well (5.2 ft of drawdown was observed while pumping at approximately 1.5 gallons per minute [gpm]). As a result, the upper portion of the screened interval could not be logged, which may potentially impact the analysis of EM flowmeter results (see Observations and Interpretation of Preliminary Field Data section below). In addition, the inline flowmeter indicated that pumping rates varied between 1.3 and 1.6 gpm (approximately 20%), which could impact the accuracy of estimated interval flow rates.

Following each logging run, USGS personnel decontaminated the geophysical tools with a Liquinox® rinse and DI rinse, and the tools were then placed back in the containers. Following the final logging runs, the wireline cable was decontaminated using a DI rinse and wiped down with a paper towel. Activities at well ND were completed by 1820 and all field personnel returned to the HMC office by 1830. EPA and USGS personnel proceeded off site. Arcadis staff met briefly with HMC personnel and Jesse Toepfer (via telephone) for debriefing before leaving the site at 1845.

Date: Wednesday, August 10, 2016

Arcadis staff arrived on site at 0605 and conducted a tailgate meeting that focused on the weather and driving, biological hazards (snakes, ants, spiders), and sun exposure protection. Issues associated with fatigue due to early morning start times, long hours in the field (12+-hour days), and general lack of sleep, and the importance of going to bed early were also discussed. All field personnel mobilized to well Q at 0700. Logging activities took place in the following order: caliper, multi-tool for natural gamma, induction, optical televiewer, spectral gamma, fluid temperature and conductivity, and EM flowmeter. Each logging run was conducted from the TD of the well to surface, with the exception of spectral gamma and EM flowmeter logging. Spectral gamma was logged from TD to 10 ft above the top of the screened interval at

57.5 ft. EM flowmeter logging included ambient trolling down, pumping, and depth-specific station measurements within the screened interval of the well. For the pumping flowmeter logging run, the pump was positioned at 55 ft below ground surface (bgs) within the blank casing interval of the well to allow for drawdown in the well (2.2 ft of drawdown was observed while pumping at approximately 1.75 gpm). This allowed the entire screened interval to be logged. The inline flowmeter indicated that pumping rates varied between 1.6 and 1.9 gpm (approximately 17%), which could impact the accuracy of estimated interval flow rates.

Following each logging run, USGS personnel decontaminated the geophysical tools with a Liquinox® rinse and DI rinse, and the tools were then placed back in the containers. Following the final logging runs, the wireline cable was decontaminated using a DI rinse and wiped down with a paper towel. Activities at well Q were completed by 1355 and all field personnel returned to the HMC office.

USGS personnel mobilized to well DD at 1450. Logging activities took place in the following order: caliper, multi-tool for natural gamma, induction, optical televiewer, spectral gamma, and fluid temperature and conductivity. Each logging run was conducted from the TD of the well to surface, with the exception of spectral gamma. Spectral gamma was logged from TD to approximately 30 ft bgs. Following each logging run, USGS personnel decontaminated the geophysical tools with a Liquinox® rinse and DI rinse, and the tools were then placed back in the containers. Following the final logging runs, the wireline cable was decontaminated using a DI rinse and wiped down with a paper towel.

Activities at well DD were stopped at 1752 prior to conducting EM flowmeter logging due to the late time of day. All field personnel returned to the HMC office by 1815. EPA and USGS personnel proceeded off site. Arcadis staff met briefly with HMC personnel and Jesse Toepfer (via telephone) for debriefing before leaving the site at 1840.

Date: Thursday, August 11, 2016

Arcadis staff arrived on site at 0610 and conducted a tailgate meeting. Heavy rain overnight required that HMC personnel inspect roads to determine if they were passable. Based on the inspection, field work was put on hold until conditions improved. Arcadis staff focused on paperwork and report preparation, and HMC provided required training for radiological exposure. By 1200, it was apparent that field work would not be able to resume and all field personnel left the HMC office.

Date: Friday, August 12, 2016

Arcadis staff arrived on site at 0850 and conducted a tailgate meeting that focused on heat stress, given that this was one of the hotter days of the event. HMC personnel indicated they had cut the excessive vegetation around well DD-2 after inspection revealed it was overgrown and access would be difficult. HMC staff inspected roadway conditions and concluded that field work could resume after internal meetings were completed at 0900.

All field personnel remobilized to well DD at 0915 to conduct EM flowmeter geophysical logging at that location. EM flowmeter logging included ambient trolling down, pumping, and depth-specific station measurements within the screened interval of the well. For the pumping flowmeter logging run, the pump was positioned at 56 ft bgs, approximately 14 ft within the screened interval of the well and 10 ft below the static water level, to allow for drawdown in the well (1.8 ft of drawdown was observed while pumping at approximately 1.0 gpm). As a result, the upper portion of the screened interval could not be logged, which may potentially impact the analysis of EM flowmeter results (see Observations and Interpretation of Preliminary Field Data section below). The inline flowmeter indicated that pumping rates varied between

0.97 and 1.01 gpm. Logging at well DD was completed at 1215, and USGS personnel completed decontamination procedures.

All field personnel mobilized to well DD-2 at 1315. Logging activities took place in the following order: caliper, multi-tool for natural gamma, induction, optical televiewer, spectral gamma, fluid temperature and conductivity, and EM flowmeter. Each logging run was conducted from the TD of the well to surface, with the exception of spectral gamma and EM flowmeter logging. Spectral gamma was logged from TD to approximately 35 ft bgs. The optical televiewer log revealed dark staining on significant portions of the slotted and blank casing. EM flowmeter logging was initiated with the ambient trolling down run. Issues with the logging were observed including unexplained spikes on the log curve. The tool was pulled and upon visual inspection, a black material was found to be fouling the tool. After cleaning and redeploying the tool, a repeat section was run with slightly better, but unrepeatable results. Before pulling the tool, a few depth-specific station measurements were collected within the screened interval of the well. A decision was made to forgo a pumping flowmeter test at this location. It was later hypothesized that the dark material fouling the tool was likely organic material (possibly rodent remains) that was in the well and coating the casing as observed on the optical televiewer.

Logging at well DD-2 was completed at 1841, and following decontamination, all field personnel returned to the HMC office at 1900. EPA and USGS proceeded off site. Arcadis staff met briefly with HMC personnel and attempted a debriefing call with Jesse Toepfer before leaving the site at 1940.

Date: Saturday, August 13, 2016

Arcadis staff arrived on site at 0600 and conducted a tailgate meeting that focused on paying attention and not moving too fast on the final day of field work. All field personnel mobilized to well T-11 at 0625. Logging activities took place in the following order: caliper, multi-tool for natural gamma, induction, optical televiewer, spectral gamma, fluid temperature and conductivity, and EM flowmeter. Each logging run was conducted from the TD of the well to surface, with the exception of EM flowmeter logging, which included ambient trolling down and depth-specific station measurements within the saturated screened interval of the well. A pumping flowmeter logging run was not conducted at well T-11.

Following each logging run, USGS personnel decontaminated the geophysical tools with a Liquinox® rinse and DI rinse, and the tools were then placed back in the containers. Following the final logging runs, the wireline cable was decontaminated using a DI rinse and wiped down with a paper towel. After a stop work break due to lightning at 1302, logging activities resumed at well T-11 and were completed by 1435. All field personnel returned to the HMC office by 1443. EPA and USGS packed their gear while Arcadis staff met briefly with HMC personnel and held a debriefing call with Jesse Toepfer. All field personnel left the site by 1508.

Observations and Interpretation of Preliminary Field Data

The following observations are provided for each monitoring well location and are based on the preliminary field data collected. It should be noted that pre-processed geophysical data are subject to changes and corrections, and additional information will be provided after the geophysical data are fully processed. For example, the field logs of the spectral gamma data show only relative detections and changes in detections for thorium, uranium, and potassium isotopes over the vertical profile logged. Following processing, concentrations of those isotopes will be provided. In addition, borehole geophysical data are best analyzed by comparing results of the full suite of logs and evaluating results from multiple locations (multiple lines of evidence) rather than individual log results. For example, natural gamma and induction logging methods each provide information on lithology based on indirect measurements of soil

properties that are not exclusive to a particular soil type; however, in combination they can indicate a particular soil type with greater assurance.

It should also be noted that geophysical tools vary in length, and the position of detectors on the tools varies. Adjustments are made by the geophysicist to account for these variations so that data reported on the final logs are relative to ft bgs. During the logging of well DD-2, the USGS geophysicist reported a potential error in measurements of well casing diameter and stick-up lengths. The measuring tape used was graduated differently on each side of the tape: in ft and inches on one side and in ft and tenths of a foot on the other. The geophysicist indicated that he believed he had made casing measurements and calibrated the caliper in tenths of a foot. He said corrections to the geophysical logs would be made when the data are processed. This means that actual depths and casing widths reported on field sheets may differ slightly than reported on the final geophysical logs, although relative depths from the MP and ground surface will not be affected as they rely on the wireline for measurement.

Well MV

- Caliper:
  - TD at 105.2 ft bgs (98 ft and tool length of 7.2 ft).
  - Casing ID of 3.8 inches (preliminary).
- Multi-tool:
  - Gamma log indicates predominantly fine-grained materials more than approximately 84 ft bgs; clean sand/gravel from 84 to 36 ft bgs (thin, fine-grained interval from 64 to 62 ft bgs); and fining upward sequence of sediments less than 36 ft bgs.
  - Groundwater at approximately 65 ft bgs.
  - Casing prohibits resistivity data collection.
- Induction log:
  - Conductivity (inverse of resistivity) indicates gamma data are accurate/unit contacts consistent with gamma data from multi-tool; predominantly fines/clays above 25 ft bgs.
- Spectral gamma:
  - Data collected after delay (operator had problems with tool, contacted Mt. Sopris to discuss problems, and problems were resolved).
  - Data acquisition was completed, but no photograph of data display was collected due to depth-specific stacking data collection.
  - Visual recollection is that data obtained appear consistent with expectations, with potassium detections being most prominent followed by uranium and then thorium detections. Elevated detections occur in finer-grained intervals associated with silt/clay.
- Optical televiewer:
  - Screened casing observed from 105 to 75.5 ft bgs; staining on casing observed from 87 to 84 ft bgs, likely due to permanent pump intake zone.
  - No noticeable well casing issues to surface.

- Fluid temperature/conductivity log:
  - Groundwater elevation of 65 ft bgs.
- No EM flowmeter data collected.

Well ND

- Caliper:
  - TD at 68.7 ft bgs (61.5 ft and tool length of 7.2 ft).
  - Casing ID of 3.42 inches (preliminary).
- Multi-tool:
  - Gamma log indicates predominantly fine-grained materials more than approximately 56 ft bgs; coarsening upward sequence from 56 to 40 ft bgs with coarsest sediments from 50 to 40 ft bgs; fine-grained materials from 40 to 38 ft bgs; and interbedded sands/silts from 38 ft bgs to surface.
  - Groundwater at approximately 42 ft bgs.
  - Casing prohibits resistivity data collection.
- Induction log:
  - Conductivity indicates gamma data are accurate/unit contacts consistent with gamma data from multi-tool (above).
- Optical televiewer:
  - Blank screen more than 61.5 ft bgs.
  - Screened casing observed from 61.5 to 41.5 ft bgs.
  - No noticeable well casing issues to surface.
- Spectral gamma:
  - Data collected from TD to 10 ft above screened interval.
  - Data show that isotope detections peak in fine-grained sediments, but are largely absent in more highly conductive intervals of alluvial sediments, particularly from 45 to 40 ft bgs.
  - Data acquisition results appear consistent with expectations.
- Fluid temperature/conductivity log:
  - Groundwater elevation of 38.5 ft bgs.
- EM flowmeter:
  - Ambient up and ambient down trolling plus ambient station measurements indicate that vertical gradient/flow under ambient conditions is minimal.
  - Pump intake was set at 47 ft bgs, within screened interval.
  - Constant flow rate established at approximately 1.3 to 1.6 gpm, with approximately 5.2 ft of drawdown.

- Logging conducted from 58 to 47 ft bgs indicates that 1.2 gpm of flow is from below pump intake.
- What appears to be the most hydraulically conductive interval from 45 to 40 ft bgs (based on gamma/induction logging) could not be logged due to pump placement.

Well Q

- Caliper tool:
  - TD at approximately 100.5 ft bgs (93.3 ft plus tool length of 7.2 ft).
  - Well ID casing of 3.4 inches (preliminary).
- Multi-tool:
  - Gamma log indicates sandy sediments from TD to 86 ft bgs; fine-grained material from 85 to 80 ft bgs; sandy sediments from 80 to 56 ft bgs; fine-grained materials from 56 to 52 ft bgs; and multiple coarsening-upward interbedded sequences from 52 to 12 ft bgs.
  - Groundwater at approximately 42 ft bgs.
  - Casing prohibits resistivity data collection.
- Induction log:
  - Conductivity indicates gamma data are accurate/unit contacts are consistent with gamma data from multi-tool (above). Pore fluids in shallow saturated sediments less than 42 ft bgs are fairly conductive, indicating high TDS concentrations. Conductivity decreases with depth; coarse sand from 80 to 56 ft bgs exhibits lower conductivity than shallow saturated zone.
- Spectral gamma:
  - Data collected from TD to 10 ft above screened interval (approximately 57 ft bgs).
  - Data show that potassium isotope detections are dominant followed by uranium and then thorium detections. Highest detections (counts per second) of uranium and potassium isotopes occur in fine-grained sediments at approximately 80 ft bgs.
  - Data acquisition results appear consistent with expectations.
- Optical televiewer:
  - Screened casing observed from TD to 67.5 ft bgs. A joint in casing was observed at 85 ft bgs. Screen slot density appears greater in screen casing more than 85 ft bgs.
  - No noticeable well casing issues to surface.
- Fluid temperature/conductivity log:
  - Groundwater elevation of 43 ft bgs.
- EM flowmeter:
  - Ambient down trolling plus ambient station measurements indicate that vertical gradient/flow under ambient conditions is minimal.
  - Pump intake was set at approximately 50 ft bgs, but excessive drawdown with pumping resulted in pump being lowered to approximately 55 ft bgs in blank casing.

- Constant flow rate established at approximately 1.63 to 1.94 gpm, with approximately 2.2 ft of drawdown.
- Logging conducted from 99 to 57 ft bgs indicates that inflow is distributed relatively evenly across the screened interval, although a slight reduction of inflow is observed below 85 ft bgs, consistent with different screen characteristics observed on the optical televiewer.

Well DD

- Caliper:
  - TD at 80 ft bgs (72.8 ft plus tool length of 7.2 ft).
  - Casing ID of 3.4 inches (preliminary).
- Multi-tool:
  - Gamma log indicates that the saturated sediments are predominantly fine grained with sandy intervals more than 74 ft bgs and from 49 to 44 ft bgs. Some thin, sandy interbeds are indicated between 74 and 49 ft bgs. Coarse sands are present from approximately 30 to 10 ft bgs in the unsaturated sediments.
  - Groundwater at approximately 46 ft bgs.
  - Casing prohibits resistivity data collection.
- Induction log:
  - Conductivity indicates gamma data are accurate/unit contacts consistent with gamma data from multi-tool (above).
  - Conductivity of shallow saturated sand (49 to 46 ft bgs) is elevated, indicating high TDS concentrations.
- Optical televiewer:
  - Screened casing observed from TD to 42 ft bgs.
  - No noticeable well casing issues to surface.
  - Slotted casing is highly stained below water table.
- Spectral gamma:
  - Data collected from TD to approximately 30 ft bgs.
  - Data show that detections of uranium and potassium isotopes dominate. Prevalence of fine-grained sediments results in increased detections (counts per second). A peak elevated uranium detection was observed in the shallowest saturated sand at approximately 46 ft bgs.
  - Data acquisition results appear consistent with expectations.
- Fluid temperature/conductivity log:
  - Groundwater elevation of 46 ft bgs.
  - Fluid conductivity is elevated throughout saturated interval, indicating high TDS concentrations.

- EM flowmeter:
  - Ambient down trolling plus ambient station measurements indicate that vertical gradient/flow under ambient conditions is minimal or slightly downward.
  - The pump intake was set at 50 ft bgs, but sustained pumping could not be achieved so the pump was lowered to 55 ft bgs. A sustained pumping rate of approximately 4.2 gpm was achieved with 1.78 ft of drawdown. Because of the location of the pump intake, it was not possible to directly measure flow from the uppermost-producing sandy interval (water table to 50 ft bgs). Most inflow observed occurred in sandy intervals more than 66 ft bgs.

Well DD-2

- Caliper:
  - TD at 92.5 ft bgs (85.3 ft plus tool length of 7.2 ft).
  - Casing ID of 4.2 inches (preliminary).
- Multi-tool:
  - Gamma log indicates coarse sandy sediments from 56 to 52 ft bgs and 51 to 44 ft bgs, and some thin, finer sandy intervals at 70, 66, and 62 ft bgs. A coarsening upward sequence is also observed from 38 to 20 ft bgs in the unsaturated zone.
- Induction log:
  - Induction log results are consistent with gamma logging lithology. Elevated conductivity in upper saturated sandy sediments indicates relatively high TDS concentrations.
- Optical televiewer:
  - Screened casing observed from TD to 54 ft bgs.
  - Dark black scale/staining observed throughout most of the casing.
- Spectral gamma:
  - Data collected from TD to approximately 45 ft bgs.
  - Data show that potassium isotope detections are dominant followed by uranium and then thorium detections. Highest detections (counts per second) of uranium and potassium isotopes occur in fine-grained sediments, and thorium is nearly absent more than 60 ft bgs.
- Fluid temperature/conductivity log:
  - Groundwater elevation of 45 ft bgs.
- EM flowmeter:
  - Ambient down trolling was impacted by fouling of the tool from debris in the well. A few ambient station measurements were collected. No pumping data were collected.

Well T-11

- Caliper:

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  - TD at 193 ft bgs (185.7 ft plus tool length of 7.2 ft).
  - Casing ID of 5.0 inches (preliminary).

- Multi-tool:
  - Gamma logging indicates clean sand from 190 to 178 ft bgs; primarily fine-grained sediments from 178 to 172 ft bgs; a coarsening upward sequence from 152 to 110 ft bgs; and fine-grained sediments from 110 to 103 ft bgs. Gamma counts were off-scale less than 103 ft bgs (with the exception of 90 to 95 ft bgs), indicating that the interval consisted of tailings materials. Logging (after rescaling) indicates that tailings materials are fine grained with a few thin sandy interbeds.

- Induction log:
  - Induction log results indicate very high conductivity representative of high TDS concentrations.
  - Casing joints show high conductivity spikes (banding/centralizers on casing suspected).

- Optical televiewer:
  - Screened casing observed from TD to 113 ft bgs.
  - Brown staining observed from TD to approximately 128 ft bgs.
  - Just above observed casing joints are a series of marks that appear to be screws penetrating the casing, which would explain elevated conductivity at casing joints.

- Spectral gamma:
  - Data collected from TD to near surface.
  - Spikes in uranium counts per second detected at 175 ft bgs (in fine-grained interval), 100 ft bgs, and 92 ft bgs. Rescaling was done at 70 ft bgs due to off-scale counts. Potassium and uranium counts per second appear to increase in steps occurring at approximately 110 ft bgs and 75 ft bgs.

- Fluid temperature/conductivity log:
  - Fluid conductivity is very high at depth (22,000 microsiemens per centimeter [µS/cm]) and decreases upward in steps at approximately 170 and 140 ft bgs. The tool got stuck temporarily at approximately 115 ft bgs, and did not function above this depth.

- EM flowmeter:
  - Only ambient data were obtained (both trolling down and station testing), and initial results indicate minimal vertical flow (within the error margin of the tool).

Cross Borehole Comparisons

Based on natural gamma and induction response, the geophysical logs correlate well with respect to lithology and stratigraphy. Within the saturated portion of the alluvium, a relatively thick sequence of coarse-grained sediments is present along the axis of wells Q, T-11, and MV, and those coarse-grained sediments tend to thin and have greater amounts of finer-grained sediments to the east and west (wells DD, DD-2, and ND). Saturated sediments within the alluvium occur within a higher stratigraphic horizon in wells located beneath and upgradient (north) of the LTP (all locations except well MV). The shallow-most saturated sediments at the locations of wells ND, DD, and DD-2 are relatively free of fine-grained

sediments and likely have the highest yields; however, flowmeter logging could not be conducted at well DD-2 or in the upper saturated zones at wells ND or DD.

Induction logging results are consistent with gamma results for lithology and stratigraphy. Elevated TDS concentrations in pore fluids were indicated in shallow saturated sediments at wells Q and DD and in deeper intervals at well DD-2. Induction logs for well T-11 indicate very high TDS results, which were confirmed by the fluid conductivity log for well T-11.

Spectral gamma and EM flowmeter results cannot be evaluated until the processed geophysical logs are released by USGS, but initial results suggest that ambient vertical gradients are minimal or were not detected. Potential influences of well construction need to be evaluated for pumping flowmeter responses. Spectral gamma results generally indicate that potassium isotopes are most prevalent followed by uranium and then thorium. Elevated detections of radioactive isotopes correlate well with intervals for which gamma and induction logging indicates fined-grained sediments are present.

EVENT #3 OVERVIEW – PASSIVE SAMPLER DEPLOYMENT

Personnel in attendance from EPA and USGS included:

- Sai Appaji, EPA Region 6
- Phil Hearte, USGS, New Hampshire/Vermont Water Science Center
- Johanna Blake, USGS, New Mexico Water Science Center

Following geophysical logging, USGS identified separate depth locations within six wells (Q, ND, DD, DD-2, MV, and T-11) for the installation of passive samplers (Table 1). Arcadis deployed equivalent passive samplers within the same mesh sleeve to assess the reproducibility/variability of EPA/USGS methods and results.

Passive nylon screen samplers were constructed by both USGS and Arcadis following the approach detailed in Vroblesky et al. (2002, 2003a, 2003b). Passive samplers were constructed from 250-milliliter wide-mouth polyethylene bottles and 125-micron nylon screen. The center of each 250-milliliter bottle cap were drilled out to leave only the threaded portion that screws onto the bottle. The caps were then screwed onto the bottles over an approximate 2-inch by 2-inch section of nylon screen. Passive samplers were filled with ASTM International (ASTM) Type II laboratory-grade DI water and kept in buckets that had been acid-washed and then tripled-rinsed with ASTM Type II laboratory-grade DI water until arrival at the site.

To deploy the passive samplers at discrete depth intervals in each of the wells, USGS prepared a pre-marked deployment rope. The rope was a multi-strand twisted polyester or nylon rope that had been pre-measured to the anticipated total well depth by USGS prior to arrival at the site. Each deployment rope had a knot at one end representing the top of casing. It appeared that passive sampler depths were measured from that knot. Individual depth locations were marked on each well deployment rope with a colored zip-tie. Every 10 ft was marked with a set of small zip-ties. For example, the depth of 50 ft was marked with five small zip-ties and 60 ft with six small zip-ties. A weight was placed on the deployment rope during installation and consisted of a stainless-steel chain that was looped and zip-tied to the bottom-of-well end of the nylon rope.

At the time of installation, passive samplers were placed in a red polyethylene mesh sleeve. Each mesh sleeve containing the passive samplers was then attached to a pre-measured nylon deployment rope

using zip-ties at depth interval. The mesh sleeves for each passive sampler depth location were attached to the rope such that the USGS bottle was always just below the colored zip-tie depth marking, and the HMC sampler was always just above. USGS used a minimum of eight zip-ties for each depth interval.

Passive samplers were installed at the deepest interval first; as passive samplers were attached to the deployment rope, the rope was lowered in the well. After all passive samplers were installed, the deployment rope was attached to a carriage bolt that had been threaded through two holes in the well casing near the top of the well. The deployment rope was first tied to the bolt and then zip-tied. Finally, any excess deployment rope was threaded through two holes drilled on the well top-cap and tied with a knot. Each well was completed by taping the top-cap to the well casing, and then attaching a sign to the well warning that an experiment was ongoing in the well. The Arcadis photographic log from the passive sampler installation is provided in Attachment 1.

Two senior-level staff from Arcadis were in attendance for the passive sampler installation:

- Patsy Moran, Geochemistry/Project Technical Lead
- Joe Gilbert, Geologist

Summary of Activities – Passive Sampler Deployment

Date: Tuesday, August 30, 2016

Arcadis met with HMC at approximately 0740 to review likely activities. EPA and USGS personnel arrived on site at approximately 0940. After introductions, HMC conducted a safety meeting and completed an FLRA for site activities. During the morning meeting with USGS, passive samplers built by Arcadis were examined and USGS agreed that the HMC samplers matched the USGS samplers in design. USGS suggested cooling the sample bottles to the same temperature as groundwater. Arcadis confirmed groundwater temperatures (12 to 13 degrees Celsius), and placed all samplers on ice until deployment. USGS and Arcadis began passive sampler installation on well Q at approximately 1100. Passive samplers were installed at well ND starting at approximately 1300 and at well DD starting at approximately 1500. All personnel were off site by 1630.

Details of Passive Sampler Installation at Well Q

- Eight intervals of passive samplers were installed.
- Additional bottles for duplicate samples (one for HMC and one for USGS) were placed in the well.

Details of Passive Sampler Installation at Well ND

- Six intervals of passive samplers were installed.
- Additional bottles for duplicate samples (one for HMC and one for USGS) were placed in the well.

Details of Passive Sampler Installation at Well DD

- Six intervals of passive samplers were installed.
- Additional bottles for duplicate samples (one for HMC and one for USGS) were placed in the well.

Additional Information

The number of duplicate quality control (QC) sample bottles was increased to one per well per team (one USGS sample bottle and one HMC sample bottle). This is a change from what was initially discussed with USGS. USGS stated that they likely would not submit all duplicate samples for analysis, but would collect at least one per well.

It was noted that USGS did not take any actual measurements in the field, but relied on the deployment rope to record sampler placement depths. During the course of installation at each well, USGS appeared to make slight changes to the rope:

- For well Q, USGS wrapped the top of the rope around the securing bolt several times and the top-of-casing knot did not match up with the actual top of casing.
- For well ND, USGS made a loop in the deployment rope in order to attach the samplers, potentially shortening the rope. USGS also suggested that the top-of-casing knot was not correct, and retied the knot, lowering the rope an additional 3 to 4 ft in the well.
- For well DD, USGS cut approximately 10 ft of rope from the bottom.

These changes to the deployment rope may have resulted in their placement depths being off by a few inches to a few ft. To confirm proper placement and sample depths, Arcadis plans to measure the deployment rope using a tape during passive sampler retrieval.

During installation of the passive samplers, USGS used a large number of zip-ties, and not consistently. At several intervals, zip-ties were placed directly around the HMC bottle caps, which may impede flow.

Date: Wednesday, August 31, 2016

Arcadis arrived on site at 0720, and EPA and USGS arrived at 0740. During a brief morning meeting, the potential for systematic error was discussed, and Arcadis requested that HMC duplicate bottles be placed at the lower depth interval that day since HMC bottles were placed in the upper interval during the previous day's installation at wells Q, ND, and DD. This suggestion was rejected by USGS, although it was agreed that HMC samplers would be placed at the deepest intervals in wells DD-2, MV, and T-11 (Table 1). Arcadis and USGS completed passive sampler installation at wells DD-2, MV, and T-11. Following deployment, Arcadis and USGS met briefly to discuss Event #4 (passive sampler retrieval and well sampling event). All personnel were off site by 1700.

Details of Passive Sampler Installation at Well DD-2

- 10 intervals of passive samplers were installed.
- Additional bottles for duplicate samples (one for HMC and one for USGS) were placed in the well.

Details of Passive Sampler Installation at Well MV

- Eight intervals of passive samplers were installed.
- Additional bottles for duplicate samples (one for HMC and one for USGS) were placed in the well.

Details of Passive Sampler Installation at Well T-11

- 11 intervals of passive samplers were installed.

- Additional bottles for duplicate samples (one for HMC and one for USGS) were placed in the well.

Additional Information

During a post-installation meeting, USGS personnel indicated that they prefer to meet with EPA before providing additional details regarding event #4. However, USGS confirmed that the pumps for wells ST, 920, ACW, and CE-7 do not need to be pulled.

REFERENCES

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U.S. Environmental Protection Agency (EPA). 2016. Letter to HMC, Remedial Investigation/Feasibility Study (RI/FS) Equivalency: Re-Assessment of Background Groundwater at Homestake Mining Company Superfund Site. April 18.

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Vroblesky, D.A., M. Petkewich, and T. Campbell. 2002. Field Tests of Diffusion Samplers for Inorganic Constituents in Wells and at a Ground Water Discharge Zone. USGS Water Resources Investigations Report 02-0431.

Vroblesky D., W. Scheible, and G. Teall. 2003a. Laboratory Equilibration Study of Nylon-Screen Passive Diffusion Samplers for VOCs, and Select Inorganics. ITRC Spring Meeting, March 2003, Annapolis, Maryland.

Vroblesky, D.A., J. Manish, J. Morrell, and J.E. Peterson. 2003b. Evaluation of Passive Diffusion Bag Samplers, Dialysis Samplers, and Nylon-screen Samplers in Selected Wells at Andersen Air Force Base, Guam, March-April 2002, U.S. Geological Survey Water - Resources Investigations Report 03-4157.

ENCLOSURES

Tables

Table 1 Passive Sampler Deployment Depths

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Figure 1 Well Location Map

Attachments

Attachment 1 Photographic Logs - Geophysical Logging and Passive Sampler Installation

Attachment 2 Geophysical Logging Field Forms

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Tables

Table 1
Passive Sampler Deployment Depths
Homestake Mining Company
Grants Reclamation Project
Grants, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Q		ND		DD		DD-2		MV		T-11	
Depth	Duplicate	Depth	Duplicate	Depth	Duplicate	Depth	Duplicate	Depth	Duplicate	Depth	Duplicate
97		68		68		90		102		190	
93		64		63		84		98		185	
88		60	USGS	60		78	HMC	95		180	
85	USGS	57	HMC	54		75	USGS	91	HMC	175	
82	HMC	50		50	USGS	72		87	USGS	170	HMC
78		42		45	HMC	67		82		164	USGS
71						63		76		154	
57						60		67		148	
						56				140	
						48				134	
										115	

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Figures

CITY: (DENTECH) DIV/GROUP:(ENV) DB:MESTIFANOS LD: PIC: PM: TM: DATE: 6/24/2016
PROJECT PATH: Z:\GISPROJECTS_ENV\AO000120-Grants\GIS\ArcMaps\2016\BackgroundGWCharacterizationSAP\Figure1-2_Well_Location_Map.mxd

LEGEND

- Reverse Osmosis Product Water Sampling Point
- Alluvial Aquifer Well
- Upper Chinle Aquifer Well
- Middle Chinle Aquifer Well
- Lower Chinle Aquifer Well

N

0 2,000 4,000

SCALE IN FEET

Basemap features from: Hydro-Engineering, LLC, 2011

GRANTS RECLAMATION PROJECT

MONITORING WELL LOCATIONS

ARCADIS

FIGURE 1

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Attachment 1
Photographic Log

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PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 1	8/8/16

Location/Description:

Location: Site Office Parking Area

Photographed By: Patsy Moran

Comment: Equipment Tool Storage

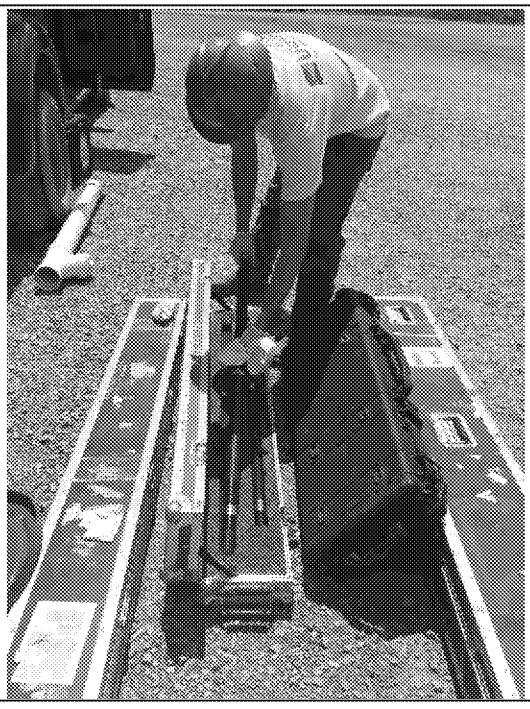

Photo No. 2	8/8/16

Location/Description:

Location: Site Office Parking Area

Photographed By: Patsy Moran

Comment: Equipment Storage in Truck

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ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 3	8/8/16

Location/Description:

Location: Site Office Parking Area

Photographed By: Patsy Moran

Comment: Equipment (Calipers) Decon

Photo No. 4	8/8/16

Location/Description:

Location: Site Office Parking Area

Photographed By: Patsy Moran

Comment: Equipment (Pulley Cable) Decon

ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 5	8/8/16

Location/Description:

Location: Mobilizing to Well ND

Photographed By: Patsy Moran

Comment: Muddy Field Conditions Due to Heavy Monsoon Storms

Photo No. 6	8/8/16

Location/Description:

Location: Well MV

Photographed By: Patsy Moran

Comment: USGS (Kent Becher) Gauging Water Level.

ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 7	8/9/16

Location/Description:

Location: Well MV

Photographed By: Patsy Moran

Comment: USGS (Jonn Thomas) Preparing Multi-Tool for Deployment.

Photo No. 8	8/9/16

Location/Description:

Location: Well MV

Photographed By: Patsy Moran

Comment: USGS Decon Induction Tool After Deploying in Well MV.

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ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 9	8/9/16

Location/Description:

Location: Well MV

Photographed By: Patsy Moran

Comment: USGS (Jonn Thomas) Removing Optical Televiewer From Well MV.

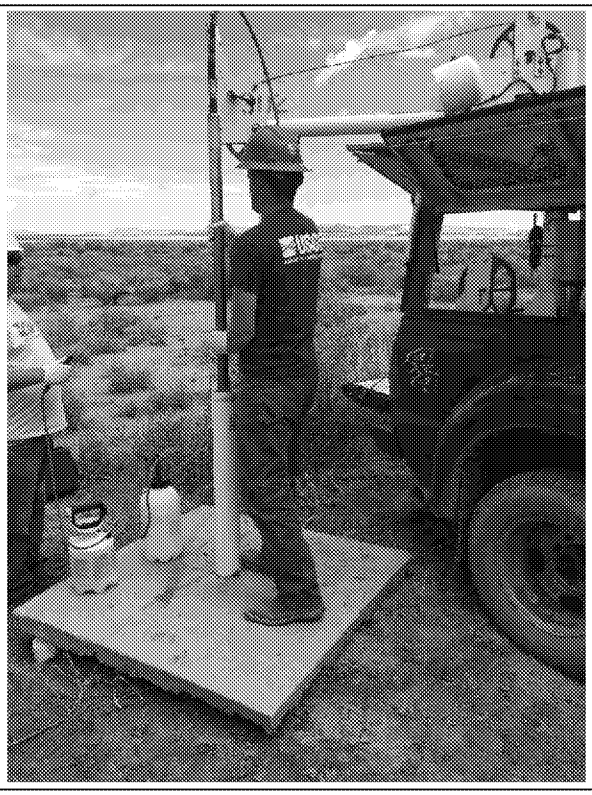
Photo No. 10	8/9/16

Location/Description:

Location: Well ND

Photographed By: Patsy Moran

Comment: USGS (Jonn Thomas) Deploying Multi-Tool into Well ND.



ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 11	8/9/16

Location/Description:

Location: Well ND

Photographed By: Patsy Moran

Comment: USGS (Jonn Thomas) Deploying Optical Televiewer Into Well MV.

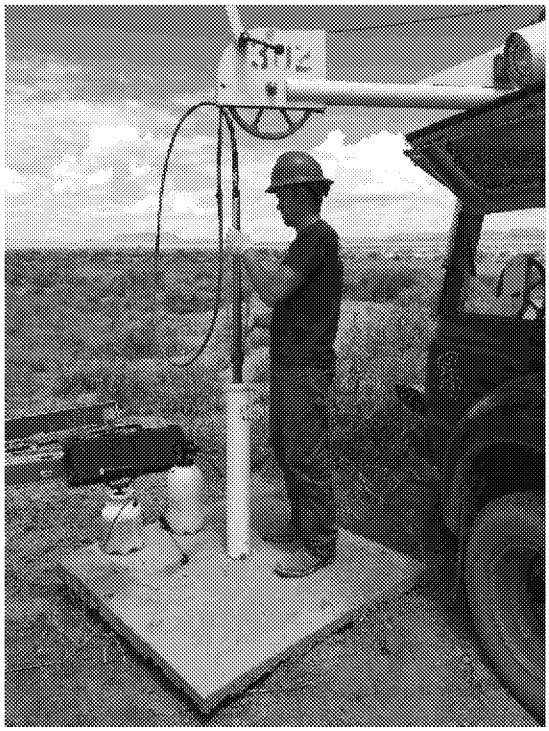


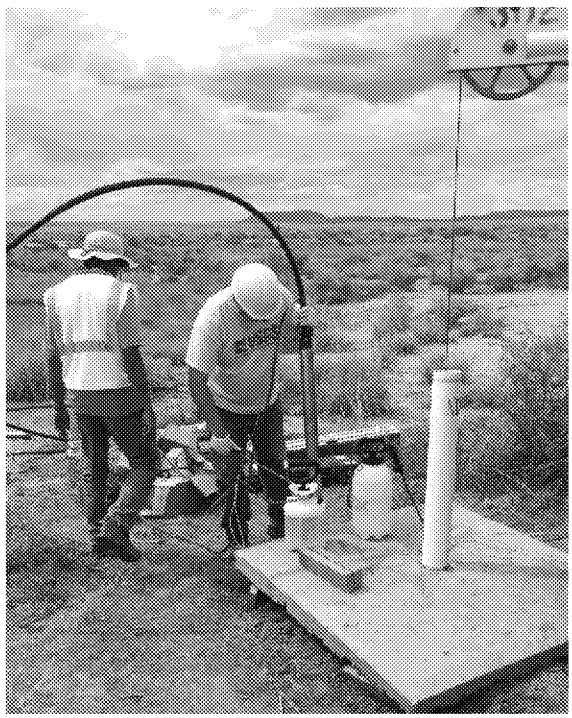
Photo No. 12	8/9/16

Location/Description:

Location: Well ND

Photographed By: Patsy Moran

Comment: USGS (Kent Becher) Preparing EM Flowmeter For Deployment Into Well ND.



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ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 13	8/9/16

Location/Description:

Location: Well ND

Photographed By: Patsy Moran

Comment: Flowmeter Connected To Well ND; Discharge Is Directed To Ground Surface.

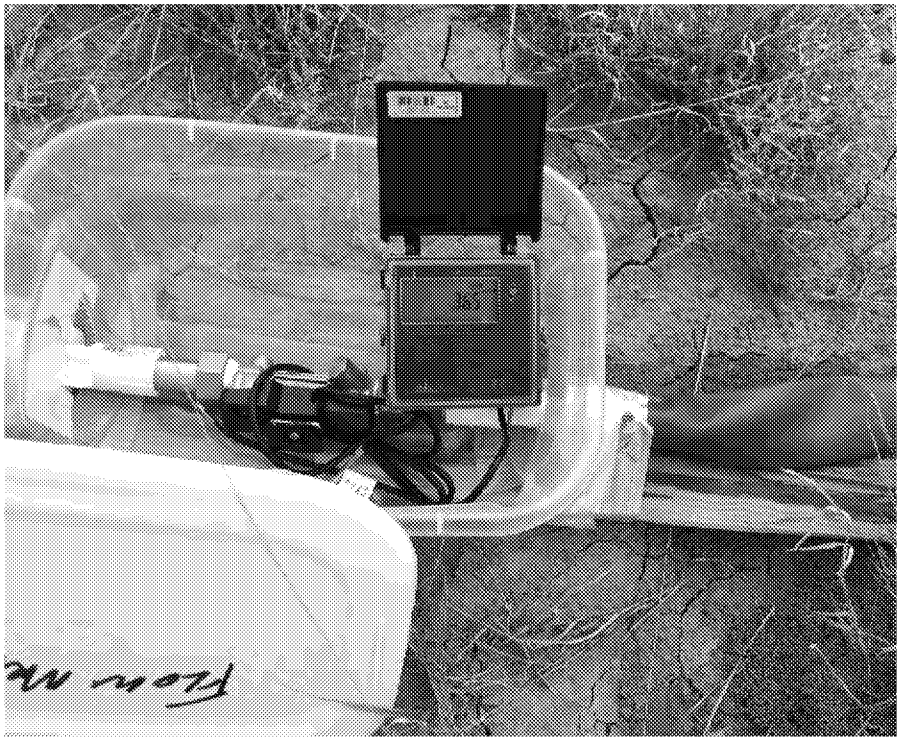
Photo No. 14	8/9/16

Location/Description:

Location: Well ND

Photographed By: Patsy Moran

Comment: Flowmeter Connected to Well ND With a Discharge Rate of ~1.6 gpm.



ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 15	8/9/16

Location/Description:

Location: Well ND

Photographed By: Patsy Moran

Comment: USGS (Kent Bercher) Gauging and Recording Groundwater Recovery following the EM Flowmeter Process in Well ND.

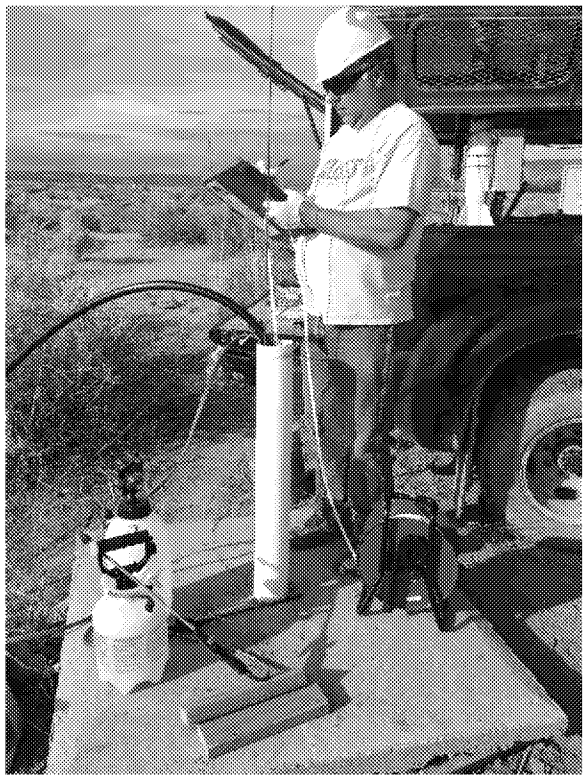


Photo No. 16	8/10/16

Location/Description:

Location: Well Q

Photographed By: Patsy Moran

Comment: USGS Setting up at Well Q

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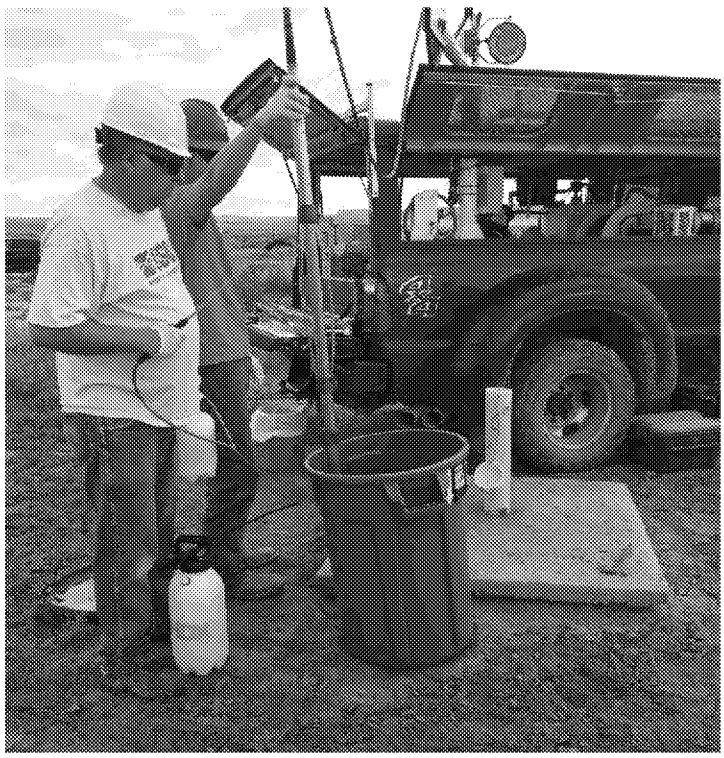
ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 17	8/10/16
Location/Description: Location: Well Q Photographed By: Patsy Moran Comment: USGS Deploying Optical Tool into Well Q	

Photo No. 18	8/10/16
Location/Description: Location: Well Q Photographed By: Patsy Moran Comment: USGS Decon Optical Tool following removal from Well Q	

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PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 19	8/10/16

Location/Description:

Location: Well Q

Photographed By: Patsy Moran

Comment: Spectral Gamma Logging Data within Field Truck

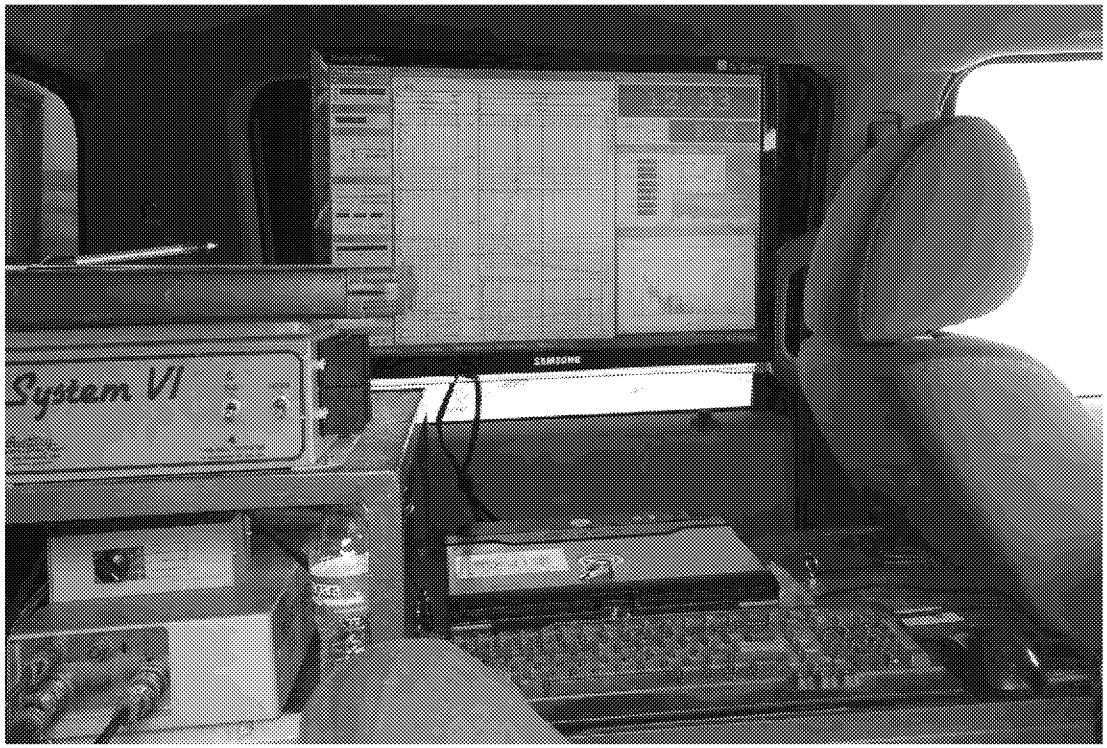

Photo No. 20	8/10/16

Location/Description:

Location: Well Q

Photographed By: Patsy Moran

Comment: USGS Lowering EM Flowmeter in Well Q with Sai Appaji from USEPA overseeing.

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PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 21	8/10/16

Location/Description:

Location: Well Q

Photographed By: Patsy Moran

Comment: USGS decon EM Flowmeter after removal from Well Q.

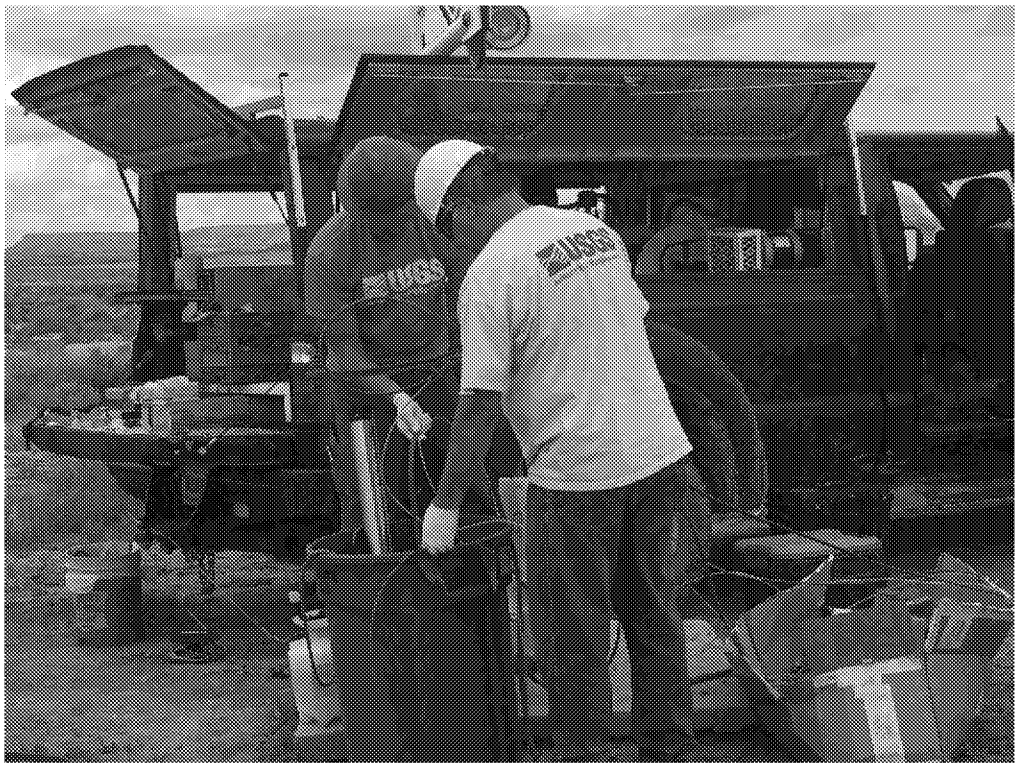

Photo No. 22	8/12/16

Location/Description:

Location: Well DD

Photographed By: Patsy Moran

Comment: Arcadis (Brad Cross) overseeing and documenting EM Flowmeter in Well DD.

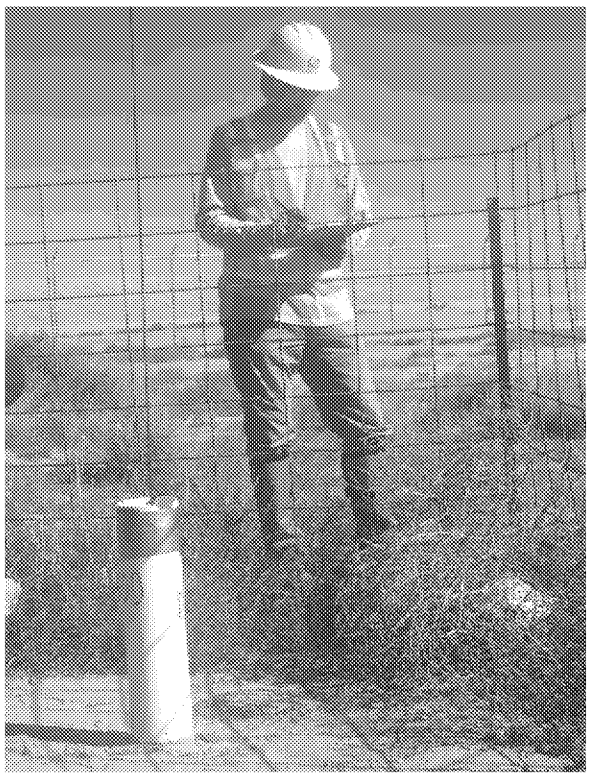

Photo No. 23	8/12/16

Location/Description:

Location: Well DD

Photographed By: Patsy Moran

Comment: USGS gauging discharge from EM Flowmeter in Well DD using a measured bucket method. Note the groundwater discharge to ground surface.

Photo No. 24	8/12/16

Location/Description:

Location: Well DD-2

Photographed By: Patsy Moran

Comment: USGS gauging depth to groundwater and well stick-up prior to geophysical tool deployment. Arcadis (Brad Cross) overlooking measurements.

ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 25	8/12/16

Location/Description:

Location: Well DD-2

Photographed By: Patsy Moran

Comment: USGS (Jon Thomas) preparing Caliper tool for deployment into Well DD-2. Note that USGS not wearing gloves while handling tool.

Photo No. 26	8/12/16

Location/Description:

Location: Well DD-2

Photographed By: Patsy Moran

Comment: USGS Lowering Optical Televiewer into Well DD-2.

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Photo No. 27	8/12/16

Location/Description:

Location: Well DD-2

Photographed By: Patsy Moran

Comment: Black organic material from Well DD-2 during decon of geophysical tools.

Photo No. 28	8/12/16

Location/Description:

Location: Well DD-2

Photographed By: Patsy Moran

Comment: Black muck – decaying matter from Well DD-2.

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ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 29	8/12/16

Location/Description:

Location: Well DD-2

Photographed By: Patsy Moran

Comment: USGS Removing and rolling up tubing from Well DD-2.

Photo No. 30	8/13/16

Location/Description:

Location: Well T-11

Photographed By: Patsy Moran

Comment: USGS set up at Well T-11 and collecting well Measurements. Arcadis (Brad Cross) overseeing.

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ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 31	8/13/16

Location/Description:

Location: Well T-11

Photographed By: Patsy Moran

Comment: Equipment setup at Well T-11 with muddy conditions. USGS (Jon Thomas) preparing equipment and Arcadis (Brad Cross) overseeing.

Photo No. 32	8/13/16

Location/Description:

Location: Well T-11

Photographed By: Patsy Moran

Comment: USGS decon Multi-Tool after use in Well T-11.

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ARCADIS

PHOTOGRAPHIC LOG: Geophysical Well Logging

Project Name: Grants Reclamation Project

Dates: August 8-13, 2016
Photographed By: Brad Cross and Patsy Moran

Photo No. 33	8/13/16

Location/Description:

Location: Well T-11

Photographed By: Patsy Moran

Comment: USGS (Jon Thomas) removing Fluid Temperature and Conductivity Tool from Well T-11.

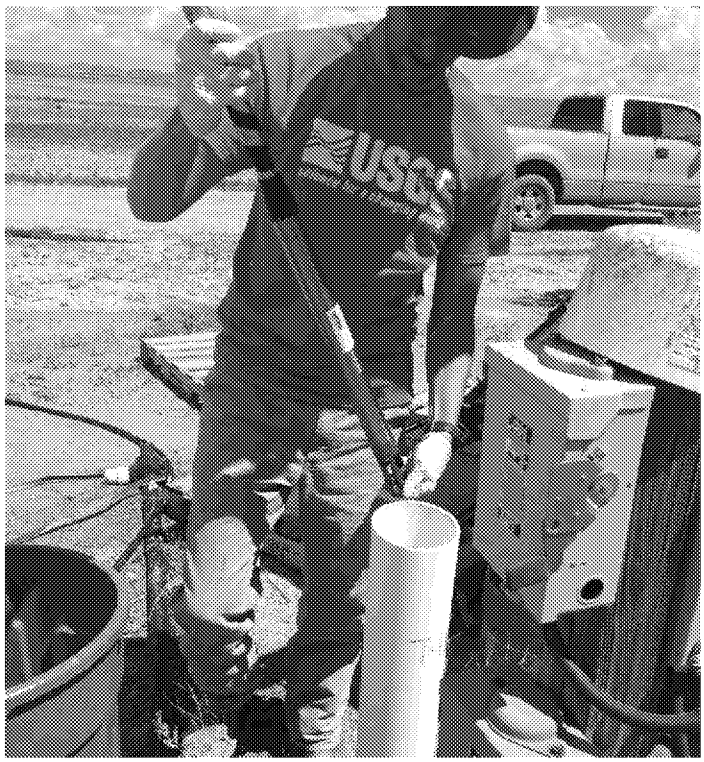

Photo No. 34	8/13/16

Location/Description:

Location: Well T-11

Photographed By: Patsy Moran

Comment: USGS Decon EM Flowmeter following removal from Well T-11.

ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 1	08/30/16

Location/Description:

Well ID: Q

Photographer: P. Moran

Comment: Initial inspection of the well cap at well Q. In this photo, left to right: J. Gilbert (Arcadis), J. Blake (USGS), P. Hearte (USGS), and S. Appaji.

Photo No. 2	08/30/16

Location/Description:

Well ID: Q

Photographer: Patsy Moran

Comment: Prior to installation of passive samplers, the USGS collected a static water level at the well. In this photo, the USGS is using a spray bottle to decontaminate their water level indicator.

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ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 3	08/30/16

Location/Description:

Well ID: Q

Photographer: Patsy Moran

Comment: In each well, a weight was placed at the bottom of a deployment rope. In this picture, the weight is held and prepared to go into well Q. The weight consists of a stainless steel chain looped together and zip-tied to the deployment rope.

Photo No. 4	08/30/16

Location/Description:

Well ID: Q

Photographer: Patsy Moran

Comment: Passive Samplers. HMC sample bottle has been placed in a mesh sleeve on top of the USGS sampler bottle and is attached to the deployment rope at a specified depth interval. Note on the deployment rope the purple zip-tie, which represents a depth sample location on the deployment rope.

ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 5	08/30/16

Location/Description:

Well ID: Q

Photographer: Patsy Moran

Comment: Once all passive samplers were installed and the deployment rope was in the well, a carriage bolt was placed across the well casing and used to hang the deployment rope in the well. In this photo, the USGS has attached the bolt and is attaching the deployment rope.

Photo No. 6	08/30/16

Location/Description:

Well ID: Q

Photographer: Patsy Moran

Comment: Well Q with passive samplers installed. The well cap was sealed with a zip-tie. A sign was taped to the outside of the well with USGS and EPA contact information.

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ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 7	08/30/16

Location/Description:

Well ID: ND

Photographer: Patsy Moran

Comment: Recording of water levels in well ND. The USGS recorded the sample information on sample sheets, included the depths of each passive sampler.

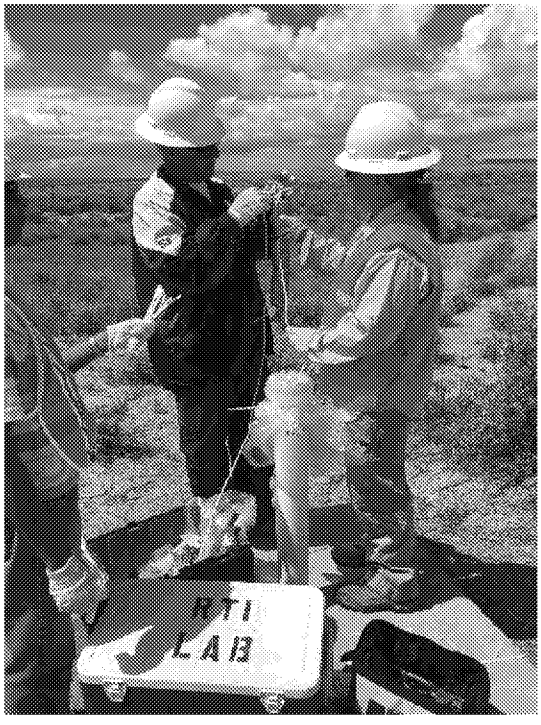
Photo No. 8	08/30/16

Location/Description:

Well ID: ND

Photographer: Patsy Moran

Comment: Duplicate sampler bottles were placed in each well. In this photo, the USGS has placed their sample duplicate at the 60 foot depth interval (just below the colored ziptie marking 60-foot interval). HMC sample duplicate was placed at the next highest interval in the well (57 feet below ground surface).



ED_004985_00011411-00191

ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 9	08/30/16

Location/Description:

Well ID: ND

Photographer: Patsy Moran

Comment: After passive samplers were installed, the deployment rope (with samplers attached) was lowered to depth in the well. The USGS used a knot tied in the deployment rope to mark the top of casing. In this photo the top of casing knot is visible and the deployment rope (and samplers are in the well).

Photo No. 10	08/30/16

Location/Description:

Well ID: ND

Photographer: Patsy Moran

Comment: Well ND with the top cap placed and secured. Passive samplers are deployed.

ED_004985_00011411-00192

ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 11	08/30/16

Location/Description:

Well ID: DD

Photographer: Patsy Moran

Comment: On all wells, the USGS placed plastic sheeting around the top of the wellhead to attempt to control debris from entering the well during passive sampler deployment. In this well, EPA and USGS are fixing plastic sheeting and preparing to drill out holes for the deployment rope bolt.

Photo No. 12	08/30/16

Location/Description:

Well ID: DD

Photographer: Patsy Moran

Comment: Well deployment ropes included a chain weight fixed to the bottom. In this photo, the USGS is holding the completed weight for installation in well DD.

ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 13	08/30/16

Location/Description:

Well ID: DD

Photographer: Patsy Moran

Comment: Passive samplers were attached to the deployment ropes using zip-ties. At some locations, it appeared that zip-ties are attached near the HMC bottle opening (center of mesh sleeve), potentially inhibiting flow in some bottles. Zip-tie placement was not consistent between sampler deployment locations.

Photo No. 14	08/30/16

Location/Description:

Well ID: DD

Photographer: Patsy Moran

Comment: Well DD secured with passive samplers deployed. At some of the well locations, the placement of the deployment rope bolt interfered with the top cap, at well DD, the cap appears to be askew.

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ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 15	08/31/16

Location/Description:

Well ID: DD-2

Photographer: Joe Gilbert

Comment: Arcadis observed the installation of each passive sampler. Arcadis staff is on the right.

Photo No. 16	5/18/16

Location/Description:

Well ID: DD-2

Photographer: Patsy Moran

Comment: In this photo, the deployment rope has been tied to the carriage bolt across the well casing and is secured with two zip-ties.

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ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 17	08/31/16

Location/Description:

Well ID: DD-2

Photographer: Patsy Moran

Comment: Well DD-2 after installation of passive samplers.

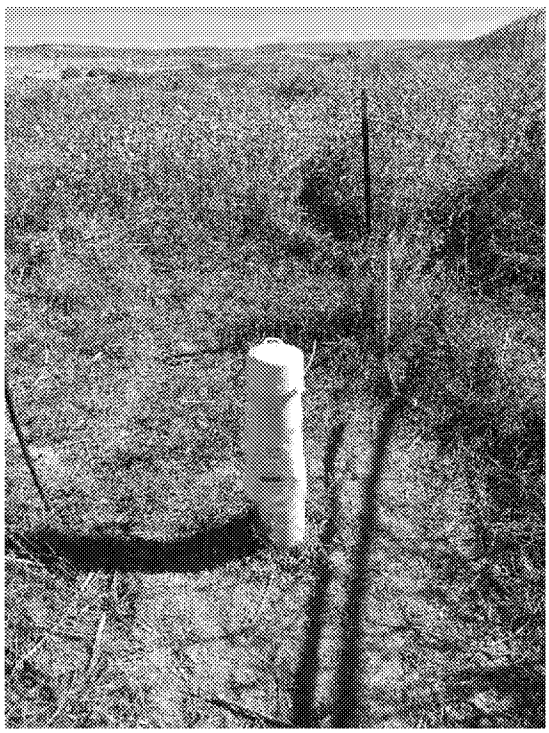

Photo No. 18	08/31/16

Location/Description:

Well ID: MV

Photographer: Patsy Moran

Comment: USGS is collecting water level information at well MV.

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ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 19	08/31/16

Location/Description:

Well ID: MV

Photographer: Patsy Moran

Comment: View of remaining USGS passive samplers. Note the drilled caps and screens placed on the bottles. The passive sampler bottles were placed cap-side-down in the red mesh sleeves (for both HMC and USGS samplers).

Photo No. 20	08/31/16

Location/Description:

Well ID: MV

Photographer: Patsy Moran

Comment: Preparation of the passive samplers. In this photo, an HMC passive sampler is handed to the USGS who is preparing to place into the mesh sleeve. Each bottle was handed cap-side-down to keep the screen wet during deployment.

ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 21	08/31/16

Location/Description:

Well ID: MV

Photographer: Patsy Moran

Comment: Well MV with cap secured and passive samplers installed.

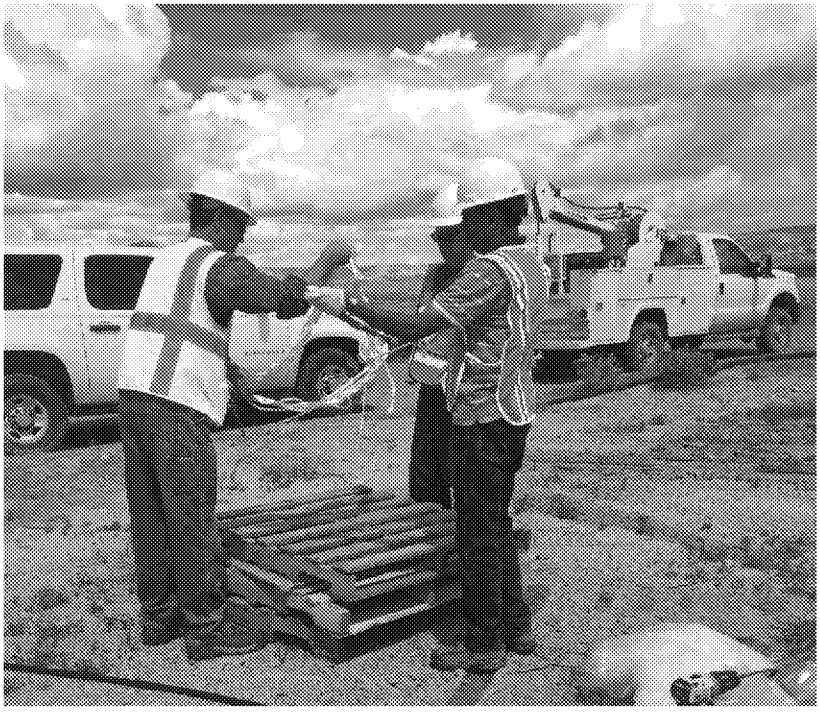
Photo No. 22	08/31/16

Location/Description:

Well ID: T-11

Photographer: Patsy Moran

Comment: Due to the depth of well T-11, USGS added a separate safety rope, tied to the deployment rope at approximately 100 feet below ground surface, and then tied to the carriage bolt to support the weight of the deployment rope. In this photo, the USGS and EPA are un-tangling the safety rope over pallets that were near T-11.



ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 23	08/31/16

Location/Description:

Well ID: T-11

Photographer: Patsy Moran

Comment: For wells DD-2, MV, and T-11, the HMC duplicate placed deeper into the well than the USGS duplicate. This was done to attempt to account for potential systematic bias in duplicate samples. In this photo, depth location 170 feet is resting on the well casing while the USGS affixes depth location 164 to the deployment rope.

Photo No. 24	08/31/16

Location/Description:

Well ID: T-11

Photographer: Patsy Moran

Comment: At well T-11, a section of the deployment rope touched the ground on top of the Large Tailings Pile. In this photo, the EPA is decontaminating the rope using a spray bottle.

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ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 25	08/31/16

Location/Description:

Well ID: T-11

Photographer: Patsy Moran

Comment: In this photo, the safety rope has been attached to the deployment rope and the USGS is using the safety rope to guide the deployment rope into place.

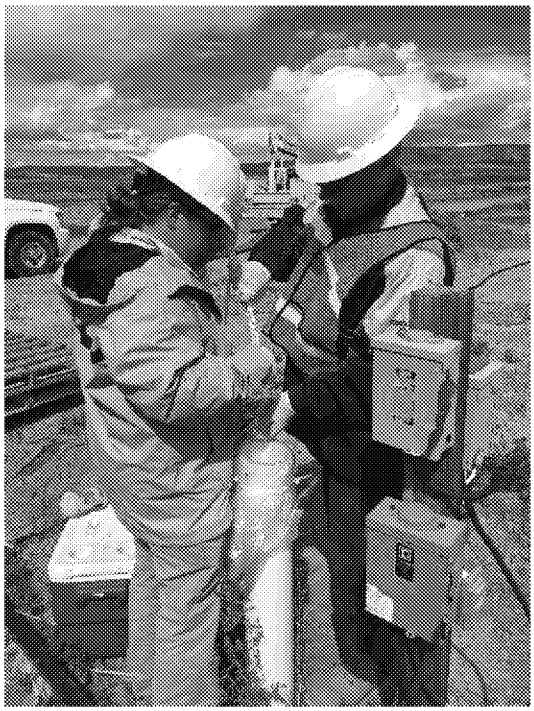

Photo No. 26	08/31/16

Location/Description:

Well ID: T-11

Photographer: Patsy Moran

Comment: Well T-11 with safety line and deployment rope attached to the carriage bolt with zip-ties.

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ARCADIS

PHOTOGRAPHIC LOG: Passive Sampler Installation

Project Name: Grants Reclamation Project

Dates: August 30 to 31, 2016
Photographed By: Joe Gilbert and Patsy Moran

Photo No. 27	08/31/16

Location/Description:

Well ID: T-11

Photographer: Patsy Moran

Comment: Well T-11 with passive samplers installed and top cap secured.

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APPENDIX B
BACKGROUND BOREHOLE DEVELOPMENT, MINEROLOGY, AND GEOPHYSICS ASSESSMENT REPORT

ARCADIS Design & Consultancy for natural and built assets

HOMESTAKE

Homestake Mining Company

BACKGROUND BOREHOLE DEVELOPMENT, MINEROLOGY, AND GEOPHYSICS ASSESSMENT REPORT

Grants Reclamation Project

July 25, 2018

ED_004985_00011411-00203

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BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

Grants Reclamation Project

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CO000120.1801

Date:
July 25, 2018

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Appendix B Geophysical Logs and Data
Appendix C Laboratory Data
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ACRONYMS AND ABBREVIATIONS

Cascade	Cascade Drilling, LP
cm	centimeters
COC	constituent of concern
cpm	counts per minute
CSM	Conceptual Site Model
DCM	DCM Science Laboratory
Fm	Formation
ft bgs	feet below ground surface
mg/kg	milligram per kilogram
mg/L	milligram per liter
MS/MSD	matrix spike/matrix spike duplicate
ppm	parts per million
Project/Site	Grants Reclamation Project
PVC	polyvinyl chloride
RI/FS	Remedial Investigation/Feasibility Study
SEM-EDS	scanning electron microscopy with energy-dispersive x-ray spectroscopy
SRB	sulfate-reducing microbes
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
XRD	x-ray diffraction

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1 BACKGROUND

The Grants Reclamation Project (Project/Site) is an approximately 1,085-acre former uranium mill site located 5.5 miles north of Milan, New Mexico in Cibola County. Milling operations took place from 1958 until 1990, depositing tailings in two onsite tailing piles: the Small Tailings Pile and the Large Tailings Pile (Figure 1). At that time, naturally occurring constituent of concern (COC) concentrations contained in the uranium ore were elevated in the tailings. The COCs include uranium, selenium, molybdenum, sulfate, chloride, total dissolved solids, nitrate, vanadium, thorium-230, and radium-226/228. Porewater seepage from the Large Tailings Pile is believed to have influenced shallow groundwater quality (alluvial and Chinle aquifers), particularly the alluvial aquifer directly beneath and downgradient of the Large Tailings Pile. The United States Environmental Protection Agency (USEPA), New Mexico Environment Department, and the Nuclear Regulatory Commission, agreed to the site standards for each COC in 2006 based on an evaluation of background water quality (HMC and Hydro-Engineering 2003). The standards were incorporated into the Radioactive Materials License via License Amendment Number 39 as Groundwater Protection Standards.

Since the establishment of the Groundwater Protection Standards, Homestake and the USEPA have pursued a CERCLA Remedial Investigation/Feasibility Study (RI/FS) equivalency evaluation for the Site. In 2016, USEPA initiated a background re-assessment study to determine if the approved background standards for the Site are appropriate under the CERCLA RI/FS equivalency process (referred to as the 2016 USGS Split-Sampling Event; USEPA 2016). Arcadis' evaluation of the results of this study show that the uranium in near upgradient wells, including wells DD and DD2 are likely due to leaching of uranium from naturally-occurring uranium-bearing sediments deposited over geologic time (at least hundreds of years for shallow alluvial deposits (Leopold and Snyder 1951) and probably thousands for deeper alluvial deposits). To test this hypothesis, a borehole development program was initiated in January 2018 near wells DD and DD2 to examine geochemical, mineralogical, and geophysical characteristics of the unsaturated and saturated soils in this area.

This report summarizes the field activities conducted in January 2018 in association with the background assessment of uranium sources at the Project. This work is related to Arcadis' interpretation of the results of the geophysics and groundwater assessment performed by USEPA and United States Geological Survey (USGS) in August 2016 and subsequent data released in 2017.

Arcadis' interpretation of the 2016 geophysical data indicated that uranium was present naturally in the alluvial aquifer sediments (soils) and supported the concept that monitoring well locations DD and DD2 exhibit elevated concentrations of uranium in groundwater due to interaction with and the nature of the minerals present in this portion of the aquifer.

The goal of the 2018 assessment was to further investigate whether uranium concentrations in groundwater in the vicinity of groundwater monitoring wells DD and DD2 are naturally derived or from mining/milling, or other anthropogenic sources. The objectives of this work were to:

1. Assess lithological variation of uranium in soils and/or weathered bedrock that were in contact with the groundwater-bearing zone and that were present in the unsaturated zone, away from groundwater contact.

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2. Support the interpretation of the geophysics data through collection and direct analysis of geologic core material.
3. Correlate uranium concentrations in soils to uranium concentrations in groundwater.
4. Link uranium naturally leaching from soils with areas of elevated groundwater uranium concentration and/or provide evidence of isolated elevated groundwater uranium concentrations away from known mining and milling impacts.

This report presents the results of the field activities in the following sections:

- **Section 2 – Activities Completed:**
  - Borehole development, lithological logging, and soil sampling.
  - Mineralogical assessment.
  - Geophysical assessment.
- **Section 3 – Results, Discussion, and CSM:** Presents the assessment results associated with the sampling activities and development of the Conceptual Site Model (CSM) for the origin of uranium in the aquifer.
- **Section 4 – Conclusions:** Provides a summary and conclusions associated with the investigation.

2 ACTIVITIES COMPLETED

Per the workplan produced by Arcadis (Arcadis 2018a), two boreholes were advanced using rotosonic drilling methods adjacent to existing groundwater monitoring wells DD and DD2 and were logged by an Arcadis geologist. During borehole advancement, soil was recovered and submitted for laboratory analysis of uranium content and other geochemical and mineralogical parameters. The boreholes were installed as blank wells with solid polyvinyl chloride (PVC) risers (no screen), and downhole geophysical logging was performed. The data obtained from lithological logging, uranium content, geochemical and mineralogical parameters, and geophysics were correlated and have been used to refine the interpretation of the geophysical data collected by the USGS in 2016 at six locations (existing wells DD, DD2, Q, ND, MV, and T11).

The borehole and geophysical data were processed and evaluated, comparing lithological variations in soils, geophysical variations, and uranium concentrations with depth. Details of the activities completed are provided in the following sections.

2.1 Drilling, Lithological, and Geochemical Assessment

Cascade Drilling, LP (Cascade) conducted the drilling using a ProSonic 600 Series rotosonic drilling rig, overseen by Arcadis. Before advancing with the drill rig, utility clearance activities were conducted, and the upper 5 feet of soil was removed by hand augur. Each borehole location was positioned as close to the associated groundwater monitoring well as was feasible, with the borehole locations presented on Figure 1. Borehole DD-BK was located approximately 10 feet to the southeast of groundwater monitoring well DD, and borehole DD2-BK was located approximately 40 feet to the northeast of groundwater monitoring well DD2.

Borehole DD-BK was drilled with a 6-inch-diameter bit to 75 feet below ground surface (ft bgs) and then a 4-inch-diameter bit to its total depth of 85 ft bgs. Borehole DD2-BK was drilled with a 6-inch-diameter bit to its total depth of 100 ft bgs. A 2-inch solid PVC riser with no screen was grouted in place with neat cement in each well, with steel centralizers installed at 11.5-13.0 ft, 48.0-49.5 ft, and 82.5-84.0 ft depths in DD-BK and 5.0-6.5 ft, 46.0-47.5 ft, and 97.5-99.0 ft depths in DD2-BK. The borehole construction details are presented in Table 1.

Both temporary boreholes were abandoned following completion of the downhole geophysical assessment by cutting the PVC riser off 3 feet below grade and filling the temporary borehole with neat cement grout to the surface using a tremmie pipe. Both boreholes, DD-BK and DD2-BK, were abandoned on January 26, 2018.

2.1.1 Geological Logging and Core Assessment

The soil was geologically logged per the Unified Soil Classification System and was screened with a radiation detector to indicate the presence of radioactive materials in the core. A Ludlum 2241 ratemeter with a 44-9 pancake detector (sensitive to alpha, beta, and gamma radiation) was used to record radioactivity along the core in the field.

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2.1.2 Soil Sampling and Laboratory Analysis

Soil samples were selected based on the lithological interpretation and radiation detector results, with sampling targeting sections of the core with lithologies to highlight differing potential background metals concentrations (principally uranium). The objectives of the sampling program were as follows:

1. Collection of samples across a wide range of lithologies.
2. Collection of samples from both the saturated and unsaturated zones. The saturated zone is where lithology is most influential on groundwater quality. The unsaturated zone experiences or has experienced minimal groundwater interaction, so its lithological characteristics are less likely to affect or be affected by groundwater geochemistry.
3. Collection of samples that showed elevated field radiation readings and/or distinct mineralogical characteristics suggestive of uranium mineralization.
4. Collection of samples that showed notable signatures during the geophysical logging, which suggested elevated uranium content.

The geochemical and mineralogical analysis goals are summarized in Table 2. The samples collected are summarized in Table 3, where ten samples were collected from borehole DD-BK, and nine samples plus a duplicate were collected from borehole DD2-BK:

- Samples were selected to cover a wide range of lithologies from fine- to coarse-grained materials, as follows:
    - DD-BK: Six samples were collected from the unsaturated zone, from various lithologies including clays, silty sands, and fine to course sands with trace silt. Four samples were collected from the saturated zone, from lithologies including clays and silty sands.
    - DD2-BK: Three samples were collected in the unsaturated zone, targeting a segment of clay (11-12 feet depth), a length of brown sand with calcified lenses containing red and yellow sub-millimeter scale minerals (25-26 feet depth), and a fine silty sand (36-67 feet depth). Six additional samples were collected from the saturated zone based on identification of lithological characteristics of interest, such as a coarse-grained sand and gravel layer, which likely represents a zone with high hydraulic conductivity, or a coarse-grained lithology confined by two very fine-grained lithologies (i.e., targeting a sand layer between clay layers).
- All samples were submitted to Energy Laboratories for analysis of uranium and metals content and leachability by an alkaline extraction using the extraction fluid recipe in Kohler et al. 2004. For these geochemistry samples:
    - Metals/metalloids analyzed for total metals included: aluminum, calcium, iron, molybdenum, phosphorus, potassium, selenium, sodium, uranium, and vanadium.
    - Metals/metalloids analyzed for leached metals included: molybdenum, selenium, uranium, and vanadium.
    - One duplicate and one matrix spike/matrix spike duplicate (MS/MSD) were collected, at a frequency of one per 20 samples, as per the Quality Assurance Project Plan (Arcadis 2018b).
    - Equipment blanks were not collected as disposable samplers were used.

  - A Level II data validation was performed for 100% of the analytical data, and a Level IV data validation was performed for 10% of the analytical data.
- Nine samples were analyzed by ACZ in Steamboat Springs, Colorado for grain size distribution.
- Samples were collected for mineralogical analysis and sent to DCM Science Laboratory (DCM) located in Lakewood, Colorado. DCM was subcontracted by ELI to conduct this work, and the samples were initially shipped to ELI. Based on the results of the geochemical analyses conducted by ELI, Arcadis selected eight samples optical mineralogy, x-ray diffraction (XRD), and scanning electron microscopy with energy-dispersive x-ray spectroscopy (SEM-EDS) for detailed uranium mineralogy.

2.2 Geophysical Assessment

Borehole geophysical logging was included to:

- Quantitatively and graphically contextualize the soil descriptions and geochemical results obtained during this investigation.
- Provide insight into the stratigraphy and allow an objective means of correlating between boreholes including the wells that the USGS logged in 2016, particularly important due to the inconsistent and undetailed descriptive information obtained during the drilling of existing wells.
- Yield direct, in-situ estimation of the concentration of total uranium in the formation.
- Guide decision making about mineralogical analysis of samples.

The geophysical assessment activities consisted of: 1) collection of geophysical parameters through the operation of borehole geophysical probes in two boreholes completed with solid 2-inch diameter schedule 40 PVC riser and 2) post fieldwork data processing of the raw field data. The types of data obtained included natural gamma ray, spectral gamma ray, and induction conductivity.

An Arcadis geophysicist collected the borehole geophysical data. The equipment was manufactured by Mount Sopris Instruments. The equipment used to move the probes within the borehole consisted of a mini-winch containing 200 meters of cable and a matrix control console. Depth of the logging probe was quantified with an encoder wheel, which was downstream of the motorized winch. The logging cable was passed over a centring tripod and pulley, and once a given probe was connected, the top of the probe was aligned with the ground surface and the control console was then zeroed. The matrix console transmitted the depth and probe data via USB cable to a laptop computer, which acted as the user control interface with the matrix console and probes. The software used for this purpose was Matrix Logger Version 10.

Three separate probes were operated in each borehole. The following summarizes the specifications for the probes:

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Probe Type	Model	Diameter (inches)	Length (inches)	Sensor Technology
Natural Gamma Ray	2PGA-1000	1.63	31.3	Scintillometer: NaI(Tl) .875"x3.0"
Spectral Gamma Ray	2SNA-1000S	1.5	46.61	Scintillometer: NaI(Tl) .875"x3.0" (temperature compensated)
Induction Conductivity	2EMA-1000	1.44	66.9	Tx-Rx separation of 50 cm, 39.2KHz Operating Frequency

Natural gamma ray and induction conductivity logging was completed in a single, continuous pass at an approximate logging speed of 12 feet per minute. The raw output from natural gamma ray and induction conductivity, aside from possible spatial filtering, generally do not require additional post-processing.

Spectral gamma ray logging was performed in two modes: dynamic and static. Dynamic logging is mainly done as a means of selecting specific locations at which to perform static measurements. This is because the statistically random nature of the gamma ray spectrum does not lend itself to dynamic, continuous measurements. To increase confidence, dynamic logging was conducted at a relatively low logging speed of three feet per minute and in a downward and then upward pass. This approach provided data for rough estimation of the uranium concentration in the alluvium. The dynamic data were reviewed in the field to select the specific static measurement locations, where the static data provided higher accuracy and precision than the dynamic data. Each static measurement was made over a 15- to 20-minute period to ensure that a statistically significant integrated value would result. The spectral gamma ray data were modeled after fieldwork in WellCAD to calculate the estimated uranium, thorium, and potassium content of the alluvium at specific fixed locations. The stripping method was used, and a specific calibration model for the logging probe was used to calculate the weight-based concentrations.

Borehole geophysical graphic logs were produced using WellCAD portraying the geophysical results, visual lithology descriptions, and relevant analytical results to facilitate comparison of the geophysical, observational, and laboratory data. Appendix B contains the graphical logs.

3 RESULTS, DISCUSSION, AND CSM

This section presents the results of the drilling, geochemical, and geophysical assessments. They are considered individually, as each provides specific lines of evidence related to the presence of uranium in the alluvial system. However, when combined, they provide the means to form a robust CSM for the placement and migration of uranium naturally in the alluvial system.

3.1 Drilling and Lithological Assessment

The drilling logs for boreholes DD-BK and DD2-BK are presented in Appendix A, and the borehole installation details are summarized in Table 1. Drilling was conducted with a sonic rig, which produced intact sediment cores. The lithology logged from boreholes DD-BK and DD2-BK indicated that the alluvial sequence is composed of an alternating and heterogeneous sequence of clays, silts, silty-sands, sandy-silts, sands with variable amounts of gravel, and occasional gravel layers. Particle size analyses of corresponding samples confirm the field-logged lithology (Table 4).

When comparing the lithological logs for DD-BK and DD2-BK to the drilling logs for adjacent groundwater wells DD and DD2, respectively, the sequence is more heterogeneous than previous drilling logs have interpreted (Appendix A). The difference can be attributed to the drilling methodologies used, with previous well installations typically conducted with mud rotary rigs, with sediments or rock chips being logged from mud returns. This investigation was conducted with a sonic drilling with the return of intact sediment or rock core that was not affected by drilling fluid of any kind. As a result, a detailed cross-section of the DD/DD2 area was constructed (Figure 2); when this cross-section is extended to include the driller's log from well Q, a distinct difference in lithological resolution can be seen. The fine variability in clays, silts, sands, and gravels that is critical for understanding uranium associations and distribution is not visible in the log from well Q. The variations in lithology and particle size variations at boreholes DD-BK and DD2-BK support the conceptual site model that alluvial materials throughout the basin were deposited over time via transport in flowing waters (or wind for fine-grained material) of variable velocity.

The drilling core was scanned with a Ludlum 2241 ratemeter with a 44-9 pancake detector, which is sensitive to alpha, beta, and gamma radiation. Distinct depth intervals with elevated radioactivity counts were apparent from the field readings. For borehole DD, radioactive decay was detected between 65 and 125 counts per minute (cpm) and for borehole DD2-BK between 65 and 125 cpm. These readings, along with geophysical downhole logging results, provided a means for sample selection where areas with higher readings were typically targeted for sampling. The depth intervals associated with elevated radioactivity readings occurred both in the saturated and unsaturated zones and from differing lithologies.

Groundwater was encountered around 45 ft bgs at DD-BK and 42 ft bgs at DD2-BK. The shallowest that groundwater has ever been measured at wells DD and DD-2 were 42 and 42.2 feet below measuring point, respectively, on May 30, 2017 and December 29, 2014, respectively. Thus, samples collected shallower than 42 feet at DD-BK and DD2-BK are considered to be in the unsaturated zone and have not been exposed to groundwater since well DD's installation in 1976 or well DD2's installation in 2008. Samples collected deeper than 42 feet below ground surface are considered to be in the saturated zone and are exposed or have been exposed to groundwater contact.

3.2 Geochemical and Mineralogical Assessments

Soil samples were collected and submitted to ELI for geochemical assessment via total metals and alkaline-leached metals analyses, and for shipment to DCM for mineralogical assessment via optical mineralogy, XRD, and SEM-EDS. Data from the geochemical and mineralogical assessments are included in Appendices B and C, respectively.

3.2.1 Geochemical Assessment

The total metals analysis represents all metals present in a sample that can be digested with hydrochloric and nitric acids, but without using hydrofluoric acid; this includes all mineralogical material except crystalline silicates. The highest uranium concentrations (1 to 10 milligrams per kilogram [mg/kg]) generally occurred in fine-grained materials including clay, silt, and silty fine sands (Table 5). In one case, a high uranium concentration (5 mg/kg) occurred in a gravely sand with silt. High uranium was generally correlated with high aluminum, iron, phosphorus, potassium, sodium, and vanadium (Figure 3). Molybdenum and selenium were not detected above a concentration of 1 mg/kg in most samples; however, in most cases, they did produce measurable leached concentrations. This indicates that, while they were not present at concentrations above 1 mg/kg, molybdenum and selenium were still present in the samples.

At borehole DD-BK, all three samples that exhibited detectable uranium were clays, and two of these three uranium-bearing samples occurred above groundwater in the unsaturated zone (Figure 3). The remaining seven samples that exhibited non-detect uranium were coarser-grained materials that ranged from fine to coarse sand to silty sand and gravel. At borehole DD2-BK, eight of the nine samples exhibited detectable uranium (Figure 4). The compositions of these samples ranged from clay to gravely sand with silt. The highest uranium concentration measured occurred in a clay in the unsaturated zone at 11-12 feet depth. This sample also exhibited the highest leachability at 0.179 milligram per liter (mg/L).

The results of the leaching analysis represent metals that are leachable in an alkaline solution, similar to alkalinity found in the alluvial aquifer in the Project area. At borehole DD-BK, molybdenum, selenium, uranium, and vanadium exhibited the greatest leachability between 36-39 ft bgs and at depths greater than 58 ft bgs in silty fine sands (Figure 3). Leached molybdenum, selenium, and uranium are roughly inversely proportional to the bulk of the total metals concentrations for aluminum, iron, phosphorus, potassium, and sodium at each depth; where high bulk metals are recorded, low to moderate leaching of molybdenum, selenium, and uranium is apparent. Leached vanadium behaves roughly inversely proportionally to its total metals concentration. This indicates that leaching of the trace elements is likely controlled by their strong association with aluminium and iron oxide minerals, and silicates in clays.

At borehole DD2-BK, selenium and vanadium exhibited greater leachability with depth, while molybdenum exhibited greatest leachability in the shallow samples (<36 ft bgs; Figure 4). Uranium was most leachable in the shallowest and deepest samples (<36 ft bgs: silty sand and clay, and >67 ft bgs: silty fine sands). Uranium displays a proportional relationship between the leached concentration and the total uranium concentration. Vanadium displays an inverse leaching relationship with its total metals concentration. In samples with high total vanadium, leached vanadium is low and vice versa.

It is important to note that the highest concentrations of uranium in soil (especially in DD2-BK) was found in the clay in the unsaturated zone (11 ft bgs), with a moisture content of ~20% by weight. This is on the

higher end of the measured moisture contents at DD2-BK (moisture content ranged from 3.1% - 23.6%). Clay retains water, as discussed in the report, but in the unsaturated zone, this water is not sourced by groundwater and therefore the uranium present here is due to dissolution of uranium-bearing minerals. The concentration of vanadium at this depth was 34 mg/kg, the highest measured in soil samples recovered from this borehole. The correlation of uranium with vanadium is a common characteristic of Morrison Fm sandstone tabular uranium-bearing minerals (see, for example, McLemore 2010).

Vanadium was detected at a very low concentration in groundwater (<0.001 mg/L) at DD and was not detected at DD2 during the 2016 USGS split-sampling event; therefore, vanadium present here is sourced from solid-phase minerals and in close association with uranium. While there may be a minor contribution of uranium in porewater or residual groundwater to the concentrations of uranium reported for the solid phase from the saturated zone, the close correlation with vanadium indicates that this uranium is predominantly present in a mineral assemblage. Vanadium appears to leach from the minerals, along with uranium, and this correlation in uranium-vanadium leaching is most evident in the results for the carbonate extraction of soil from DD-BK. In this soil, molybdenum also leaches in conjunction with uranium and vanadium, and molybdenum was detected at very low concentrations (0.001 – 0.002 mg/L) in groundwater here – this is another marker for mineral bound uranium as opposed to uranium sorbed to soil from groundwater.

In general, it is expected that leached metals results will be proportional to total metals results, though leachate characteristics, geochemical speciation, and mineralogical differences can dictate leaching behavior, with the specific mineral form of the trace element controlling its leachability. It is important to note that the variability in trace metal content with depth in the soil column, correlation between trace and major elements, and the variability in leaching behavior indicate that the trace elements reside predominantly within soil minerals rather than solely being present in residual groundwater in the collected soil or as sorbed species.

3.2.2 Mineralogical Assessment

3.2.2.1 X-Ray Diffraction

XRD was completed on six samples, with two samples receiving both bulk mineralogy XRD and clay-specific XRD. The analytical report for this work is provided in Appendix C. Table 6 shows the tabulated XRD results, plus lithologic data and uranium content data for each sample. Samples submitted for XRD included three clays and three sands, the latter ranging from silty sand to gravely sand. The majority of the non-clay material was quartz, potassium feldspar (K-feldspar), and plagioclase, representing weathering products from granites, sandstones, and occasional indications of basalt and other igneous rock types. The clays consisted of smectite, illite, and kaolin, with swelling smectite being the dominant component. Occasionally, calcite, gypsum, and hematite were detected. Visual observation suggested that up to 3% of the material was iron oxide due to the red color of the samples; this was not seen in the XRD spectra, and therefore, the iron oxide is assumed to be amorphous in nature.

3.2.2.2 Microscopy and Energy Dispersive X-Ray Spectroscopy

Geochemically-reduced (sulfides) and oxidized (sulfate/iron hydroxides) minerals are abundant, indicating heterogeneity in the mineralogical environment, microenvironments, and transitions from reducing to oxidizing conditions, affecting uranium mobility.

The samples submitted to DCM for microscopic and spectroscopic analysis can be discussed in two major classes: clays and clastic materials. The most common feature among all of the samples is that almost all contain fine-grained materials such as clays and silts, all contain iron oxides, and all contain a mixture of oxidized and reduced minerals (e.g., sulfates/oxides and sulfides). This indicates that the redox conditions to which the alluvial materials are exposed have changed over time, and demonstrates the heterogeneous nature of the alluvial sediments, both in the saturated and unsaturated zones. This could partially be due to the creation of microenvironments, especially in samples with significant clay content, which can inhibit free water and air movement through the alluvium. Microenvironments can allow the formation of reduced minerals and preservation of these minerals in an isolated area within an oxidizing aquifer.

For example, the majority of the samples contain metal sulfides, particularly notably as pyrite framboids. Pyrite framboids are most often formed by sulfate-reducing microbes (SRB) through the reduction of sulfate to sulfide (Qafoku et al. 2009). The framboids are made up of cubic and octahedral pyrite crystals that are roughly uniform in size and aggregate in a spherical structure. Over time in an oxidizing environment, the pyrite can transform into iron oxides. This occurrence is clearly seen in a SEM micrograph from sample DD2-BK-51-52-012318 (borehole DD2-BK at a depth of 50-51 ft bgs; Figure 5), where most pyrite crystals in two framboids has been converted to iron oxides; but select pockets of iron sulfide remain in the center of one of the framboids, where oxidizing agents presumably have not yet penetrated.

This process is important for a number of reasons: 1) the formation of pyrite by SRB fractionates sulfur because the SRB preferentially use the lighter sulfur isotope (Krouse and Grinenko 1991); 2) oxidation of pyrite originally formed by SRB dissolves the pyrite and releases isotopically light sulfate into groundwater (this can be seen in the light sulfate measured in groundwater throughout the SMC Basin with a $\delta^{34}S$ of -25.5 to -30.4 per mil [Arcadis 2018c, in prep; USGS 2018 in prep]; 3) pyrite is known to be a scavenger of uranium (Qafoku et al. 2009) and the oxidation of pyrite as seen here could release entrained uranium to groundwater; and 4) the presence of pyrite signals that, at one time, the alluvial materials (whether saturated or unsaturated) were at least partially reducing, a condition that is more common in fine-grained materials such as silt and clay than in coarse-grained materials such as gravels. The last point is significant because uranium itself is redox sensitive and becomes less soluble when it is in its reduced form (Descostes et al. 2010). The transition of the alluvial system or microenvironments within the alluvial system from reducing to oxidizing has the potential to release uranium through dissolution of pyrite, but also through oxidation of uranium from uranium (IV) to uranium (VI). Uranium (VI) is highly mobile, especially in water with high alkalinity, due to the formation of highly soluble uranium carbonate species, such as those encountered at the Project site and the surrounding San Mateo Creek Basin. The presence of these sulfide minerals and their transformation (oxidation) products in the aquifer system near DD and DD2 provides evidence of a mechanism for sourcing uranium to groundwater from naturally-occurring minerals.

Clays are mineralogically complex, contain abundant organic carbon, and may serve as a reservoir for reduced uranium, with diffusion of water and oxygen into clay porewater resulting in leaching of uranium to groundwater.

The clays can be characterized as iron oxide-stained clays with abundant organic inclusions and disseminated metal sulfides including pyrite (iron), chalcopyrite (copper), galena (lead), sphalerite (zinc), and assorted other minor metal sulfides. The clays also contain sporadic sulfate minerals (such as barite and gypsum) and oxides (such as iron oxides and copper oxides). The combination of reduced minerals and oxidized minerals suggests the heterogenous nature of each of the samples and the presence of microenvironments within each sample (as discussed above). Another example of this is the presence of secondarily precipitated minerals (such as euhedral gypsum, barite infilling fractures, and vugs containing clusters of the highly soluble mineral halite [sodium chloride]) in sample DD2-BK-60-61-012618 (borehole DD2 at a depth of 60-61 ft bgs; Figure 6). Contact with groundwater would dissolve halite upon contact, so its presence indicates an area that has been isolated from water contact. Calcite is also present and is intermixed with the clays. Calcite can act as a source of locally available alkalinity that can encourage leaching through the formation of uranium-carbonate species. Of the characteristics held common among the clay samples, the two most notable are the presence of high amounts of organic carbon and iron oxides. Uranium is often associated with organic carbon because organic carbon is a strong reductant and can reduce, immobilize, and concentrate uranium (Spirakis 1996). While uranium was not detectable in the samples due to detection limits of the EDS (approximately 0.1 wt. %), the presence of organic carbon can serve as a persistent source of reducing power in the alluvial system, providing means for uranium to remain immobilized in areas with high organic carbon. However, the ability of clays to restrict water flow could decrease this effect. In addition to organic carbon, iron oxides can also accumulate uranium. While iron oxides are pervasive throughout the clays and in the iron oxide psuedomorphs of pyrite, very little to no iron oxides were detected through XRD. This indicates that the iron oxides are primarily amorphous, which can occur during transformation from iron sulfide to iron oxide or when ultrafine-grained iron oxides precipitate from a solution and have not had sufficient time to "ripen" or crystallize (Zhu et al. 2016).

Minerals present in the Morrison Formation (the primary uranium host in the basin) are evident in the alluvial soils near DD and DD2 and morphologies observed indicate water-borne transport and deposition large distances from their origin.

The clastic materials range from silty sands to gravely sands and are characterized by angular to rounded quartz silts and sands, angular to sub-rounded feldspars and plagioclase, amorphous iron oxides (especially as pseudomorphs of pyrite framboids; Figures 5 and 7), and clay coatings on sand grains. The rounded and sub-rounded nature of the clastic grains indicates that they have been transported a significant distance from their source. The mix of angular clastic materials in the alluvial materials reflects either a more proximal source or that larger lithic fragments were transported and broke into smaller fragments closer to the location of their final deposition. This is the most likely case for two reasons: 1) larger lithic fragments are visible in the samples (Figure 8) as clusters of quartz and feldspar as granite and volcanic glass (DD2-BK-25-26-012218), as portions of basalt featuring euhedral crystals of labradorite plagioclase (DD2-BK-71-72-012318), and as rock fragments up to three centimeters (cm) in size consisting of indurated fine-grained arkosic sandstone cemented by a combination of iron oxide, carbonate and clay (also DD2-BK-71-72-012318); 2) the high topographic units that weathered to contribute to the alluvial materials are roughly the same distance away from boreholes DD-BK and DD2-

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BK, and are located at the boundary of the San Mateo Creek Basin. The two high-uranium units of the Morrison Formation (Fm) are the Westwater Canyon member and the Brushy Basin member; both units are known to contain claystone, kaolin, and unaltered, angular grains of feldspar (Freeman and Hilpert 1956) such as that seen in DD2-BK-25-26-012218. Both the Westwater Canyon member and the Recapture member contain medium- to coarse-grained arkosic sandstones (Santos 1970), such as those lithic fragments seen in DD2-BK-71-72-012318.

Uranium was not directly observed; however, this is likely due to its presence either as a very finely disseminated constituent that is below the detection limit of the EDS or a highly heterogeneously-distributed constituent (e.g., one grain of pitchblende or uraninite amongst thousands of grains of sand). Its origin within the alluvial aquifer soil and natural weathering and release mechanisms as supported by the various "parent" minerals that were observed and their transformation products.

Uranium is known to associate with organic matter (Spirakis 1996), pyrite (Descostes et al. 2010), iron oxides (Sato et al. 1997), clays (Campos et al. 2013), and zircons (Nasdala et al. 2010). Although uranium is detected in the bulk total metal chemistry of the stratigraphic horizons up to 10 mg/kg, uranium and uranium minerals were not detected in the samples through EDS or optical mineralogy. This could be due to two factors: either the uranium is highly segregated into discrete mineral phases (such as pitchblende) and the probability of encountering one of these mineral fragments among the thousands of other mineral grains in the samples is very low, or the uranium is so finely disseminated throughout the sample that it occurs in concentrations below the detection limit of the EDS (i.e., it is present at a concentration less than 1,000 ppm (0.1 wt. % or 1,000 mg/kg) in any one area). Both factors are likely. Upon integration of the geochemical analytical work and the microscopy and spectroscopy work, a direct correlation between the moisture content and uranium and vanadium is apparent (Figure 9). The samples with the highest percent moisture are the clays, which tend to absorb and trap water in their sheet-like structures. Similarly, the samples with the highest uranium and vanadium content are mostly clays, suggesting that the uranium and vanadium might be originating from the immobile porewaters of the clays. In this case, the evaporation of interstitial or porewater during microscopy could lead to very finely disseminated uranium precipitates throughout entire samples, thus explaining why uranium cannot be detected through EDS.

3.3 Geophysical Assessment

The geophysical logs provided in Appendix B provide a side by side comparison of geophysical, visual descriptive, and chemical responses of the alluvium and bedrock. The chart shown below is a summary of the information obtained and describes the "log tracks" shown in Figure 10. Figure 10 is a condensed representation of the geophysics data set depicted in Appendix B.

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Log Track	1	2	3	4	5
Content	Natural Gamma Ray & Induction Conductivity	Visual Description & Sample Photos	Dynamic and Static Spectral Gamma	Laboratory Total Uranium & Leachable Uranium	Laboratory Total Iron and Potassium
Information Provided and Relevance	Natural Gamma Ray normally corresponds primarily to total potassium content. Immature sediments and clays are the most common gamma ray emitters. Helps to identify subtle patterns such as coarsening or fining sequences in alluvium. Induction Conductivity is used as a supplement to natural gamma ray logging. Clays tend to be the most electrically conductive in fresh water environments, and coarse materials, such as sand, tend to be the least conductive.	Continuous sampling with the rotosonic method provided the on-site geologist with an uninterrupted alluvial sequence. This provided the ability to collect samples for laboratory testing. The geophysicist and the geologist exchanged observations and worked together to select soil samples for laboratory analysis. Photographs of the samples collected provide visual confirmation of the geophysical and descriptive results.	The uranium peak of the spectral gamma data sets was modeled using stripping and calibrated to provide uranium concentration in parts per million (ppm) total uranium. The dynamic data provide a continuous indication of gross uranium variation. The static results provide a higher confidence estimate of uranium concentration of the bulk alluvium behind the casing. Could provide insight into which facies may be contributing uranium to groundwater.	The samples collected using visual and geophysical guidance were collected using proper chain-of-custody procedures and delivered to ELI for total and leachable uranium testing as discussed above. Co-plotting with the geophysical data provides a means to visually correlate lab and field results more effectively.	Because natural gamma responds primarily to potassium-bearing minerals, inclusion of total potassium provides the means to cross-check the soil textures with the chemistry. Iron minerals are known to impact induction conductivity readings due to magnetic susceptibility of some mineral phases such as magnetite.

The natural gamma ray, induction conductivity, and visual descriptions confirm that the fine-grained materials (silts and clays) exhibit the most elevated natural gamma and electrical conductivity responses. The electrical conductivity has a positive baseline shift to the right (increasing conductivity) below the water table at approximately 45 feet depth (as expected due to the presence of water); otherwise, the electrical conductivity data track the natural gamma strongly. This relationship confirms that elevated natural gamma is due to clays rather than sandy materials containing potassium-bearing minerals such as orthoclase or muscovite.

With respect to the static spectral gamma uranium results, there is an overall strong correlation between fine-grained facies and total uranium content. Qualitatively, there appears to be roughly a two- to three-fold contrast between uranium concentration in finer facies versus coarser facies, both saturated and unsaturated. This is consistent with the conclusions documented in the Arcadis Memo dated September 1, 2017 entitled, "Analysis and Interpretation of Geophysical Logging - USGS/EPA Geophysical Logging and Passive Sampler Deployment Field Events, Grants Reclamation Project" (Arcadis 2017), quoted below.

> *In comparing the uranium concentrations in the six wells geophysically logged, it appears that the uranium is closely tied to finer grained* [sic] *materials. As a generalization, the central portion of the valley has more coarse-grained materials, which tends to display a lower uranium content (for example, see the geophysical log for well MV from 62 to 104 feet in depth, or 6513 to 6471 feet in elevation on Section A-A', where the association between grain size and uranium content is discernible)*[sic]*. In contrast, the wells at the flanks of*

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> *the valley have more fine-grained materials, and the association between spikes of uranium and fine grained* [sic] *materials, and their abundance, is in sharp contrast with well MV.*
>
> *Observe that in wells DD2 and DD, there are a number of uranium "spikes" within the screened interval. It could be inferred that the localized concentration of uranium in the soil matrix in the vicinity of the wells may provide a range and variability in uranium concentration in groundwater which, although still considered to be background, may be statistically distinct from valley-centered wells with low uranium concentration within screen* [sic] *intervals.*

The conclusions summarized above provide support that uranium is present at higher concentrations in fine grained sediments, as directly shown by the soil chemistry and mineralogical analysis and geophysics, rather than in the coarse-grained sediments where groundwater is predominantly moving. The detection of uranium at higher concentrations in groundwater at DD and DD2 is therefore due to local downward meteoric recharge penetrating through fine-grained uranium-bearing sediments deposited over geologic time, rather than to migration of groundwater from upgradient locations.

Another aspect of the geophysical interpretations is the relevance to the degree of variability in facies from location to location where wells are screened. Figure 10 is a side-by-side comparison of the natural gamma, spectral gamma, and laboratory total uranium results. By correlating the two nearby locations, several stratigraphic patterns are apparent, allowing designation of four alluvium units above the Chinle Fm, as follows, from the surface downward:

- Unit 1, approximately 10 to 12 feet thick. Interbedded silty sand and clay (upper and lower clay units). Natural gamma character very similar between both locations. The base of the lower clay was sampled in DD2-BK at 11 to 12 feet and was found to contain the highest total uranium concentration of any sample (10 mg/kg). However, spectral gamma results were between 1 and 3 ppm uranium. The discrepancies between the analytical chemistry results and the spectral gamma could be due to heterogeneity in the samples or to the inability of EPA method 3050B (total soils digestion) to dissolve all mineral content, thus leaving some uranium behind in the solid phase (this would be possible where the analytical chemistry result is lower than the spectra gamma result).
- Unit 2, approximately 20 feet thick. Relatively uniform coarse-grained material, mostly sand. Total uranium was non-detect in this unit. Spectral gamma ranged from 0.3 to 3 ppm.
- Unit 3, approximately 12 to 14 feet thick. Interbedded silty sand and sand with one clay bed. Unit is thicker and finer-grained in DD2-BK. Laboratory total uranium concentrations were all non-detect to 1 mg/kg. Spectral gamma ranged from 1 to 5 ppm with an apparent positive correlation between grain size and uranium content.
- Unit 4, approximately 27 to 32 feet thick. Complex mixture of coarse and fine materials including a number of clay beds that are poorly correlated within the unit between the two boreholes. DD2-BK has the thicker Unit 4 and appears to exhibit a greater total amount of fine-grained materials. Also, in DD2-BK, two samples contained 2 mg/kg total uranium, and one sample contained 5 mg/kg total uranium near the base of Unit 4. Spectral gamma values ranged from 0 to 4 ppm in Unit 4.

The portion of the Chinle Fm penetrated in the drilling work consisted of predominantly shale with some sandstone in DD-BK from 72 to 78 feet. Spectral gamma results from the Chinle Fm ranged from 4 to 6 ppm in the shale and 1 ppm in the sandstone.

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In general, this work corroborates the soil chemistry and mineralogy results discussed above, showing higher uranium in fine-grained materials than in coarse-grained materials and showing the presence of uranium both in the unsaturated and saturated zones.

3.4 Conceptual Site Model for Uranium Transport

A CSM has been developed for the natural weathering, transport, and deposition of uranium-rich materials and subsequent localized leaching into groundwater, as presented on Figure 11. The stages of uranium migration are as follows:

1. Weathering of sedimentary materials from surrounding mountains occurs, some with formations/beds with higher uranium concentrations and some with formations/beds with lower uranium concentrations. For example, the Recapture Member of the Morrison Fm. ranges from trace to as much as one percent uranium ore, depending on location (McLemore 2010).
2. Sediment transport occurs over geologic time (at least hundreds (Leopold and Snyder 1951) and probably thousands of years) down the valley and deposition as distinct layers, with different amounts of clay/silt/sand/gravel and differing amounts of uranium containing materials. The fine-grained materials are typically more uranium-rich. These materials can be transported further from their source than coarse-grained materials because they stay suspended longer in slowly-moving water.
3. The uranium is well-disseminated in the fine-grained alluvial material and is potentially present in other samples (fine- to coarse-grained) below the analytical detection limit of 1 mg/kg.
4. Uranium leaches from silt- and clay-rich deposits within the alluvial sequence to groundwater. The leached concentrations depend on a) the chemistry of the groundwater (alkaline water facilitates uranium leaching) or percolating meteoric water and b) the uranium content in the source material/deposited sediments; these conditions vary across the valley.
5. Groundwater samples with higher levels of uranium are typically collected from wells screened in silts and clays on a local scale.
6. Groundwater containing uranium leached from alluvial minerals mixes with groundwater from areas with low mineral-bound uranium and low leached uranium. Due to dispersion and diffusion, blending of high and low uranium waters occurs on a regional scale over time.

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4 CONCLUSIONS

Field activities for this investigation focused on assessing whether uranium concentrations in groundwater in the vicinity of groundwater monitoring wells DD and DD2 are naturally derived or from mining/milling or other localized anthropogenic inputs. This work provides a technical basis for the occurrence of uranium in groundwater at the western edge of the alluvial basin at DD and DD2 at concentrations higher than observed near the center of the alluvial channel. In summary, the following conclusions were reached:

- Sediment cores lithologically logged from boreholes DD-BK and DD2-BK indicated that the alluvial sequence is an alternating sequence of clays, silts, silty-sands, sandy-silts, sands with various amounts of gravel, and occasional gravel. The sequence is more heterogeneous than previous drilling logs have interpreted.
- Discrete depth intervals with elevated radioactivity counts were indicated in alluvial sediments from both the saturated and unsaturated zones, from various lithological types of materials. This indicates the presence of sedimentary materials in the alluvium that contain radioactive constituents deposited differentially as part of the natural depositional sequence.
- Geophysical logging indicates that the alluvium, particularly the lower two units identified in this work, are laterally highly variable even over short distances. The fine-grained materials were found to correlate with elevated uranium from spectral gamma analysis, most closely in the lower two units.
- Geochemical analyses indicate that uranium and vanadium are generally correlated with each other and with increasing porewater content due to leaching from solid alluvial materials to water.
- The highest uranium was encountered in the unsaturated zone, indicating that uranium in alluvial soils is naturally-occurring due to transport and deposition of naturally uranium-rich materials over geologic time, not from deposition from uranium-bearing groundwater.
- Mineralogical analyses suggest that the materials encountered at boreholes DD-BK and DD2-BK are associated with source rock that contains unaltered feldspars, claystones that include kaolin, and arkosic sandstones such as the Westwater Canyon and Brushy Basin members of the Morrison Fm.
- Framboidal pyrite that has been converted to iron oxides indicate that a redox change has occurred since deposition of the alluvial material. What was once reduced, supporting the formation and presence of pyrite, is now oxidized. The presence of sulfate minerals in DD-BK and DD2-BK, including large crystals of gypsum and microscopic but pervasive barite also supports this transition to an oxidized system. Such a change can result in the release of uranium due to oxidation of low-solubility U(IV) to high-solubility/high-mobility U(VI). This mechanism is a likely source of leaching of uranium from solid alluvial materials to groundwater.

A CSM has been developed that defines the erosion and subsequent deposition of uranium-rich deposits from geological formations upgradient of the Grants Mine as part of the formation of the alluvial system via natural processes. These materials were deposited in discrete lithological horizons that exist in both the saturated and unsaturated zones. The uranium-rich lithologies present in the saturated zone have the potential to cause naturally increased localized uranium concentrations. The uranium-rich lithologies present at depths of 11-36 feet in the unsaturated zone show that the uranium in alluvial sediments was emplaced, not through precipitation from groundwater, but through natural erosion and deposition of uranium-bearing minerals from bedrock sources lining the basin over geologic time.

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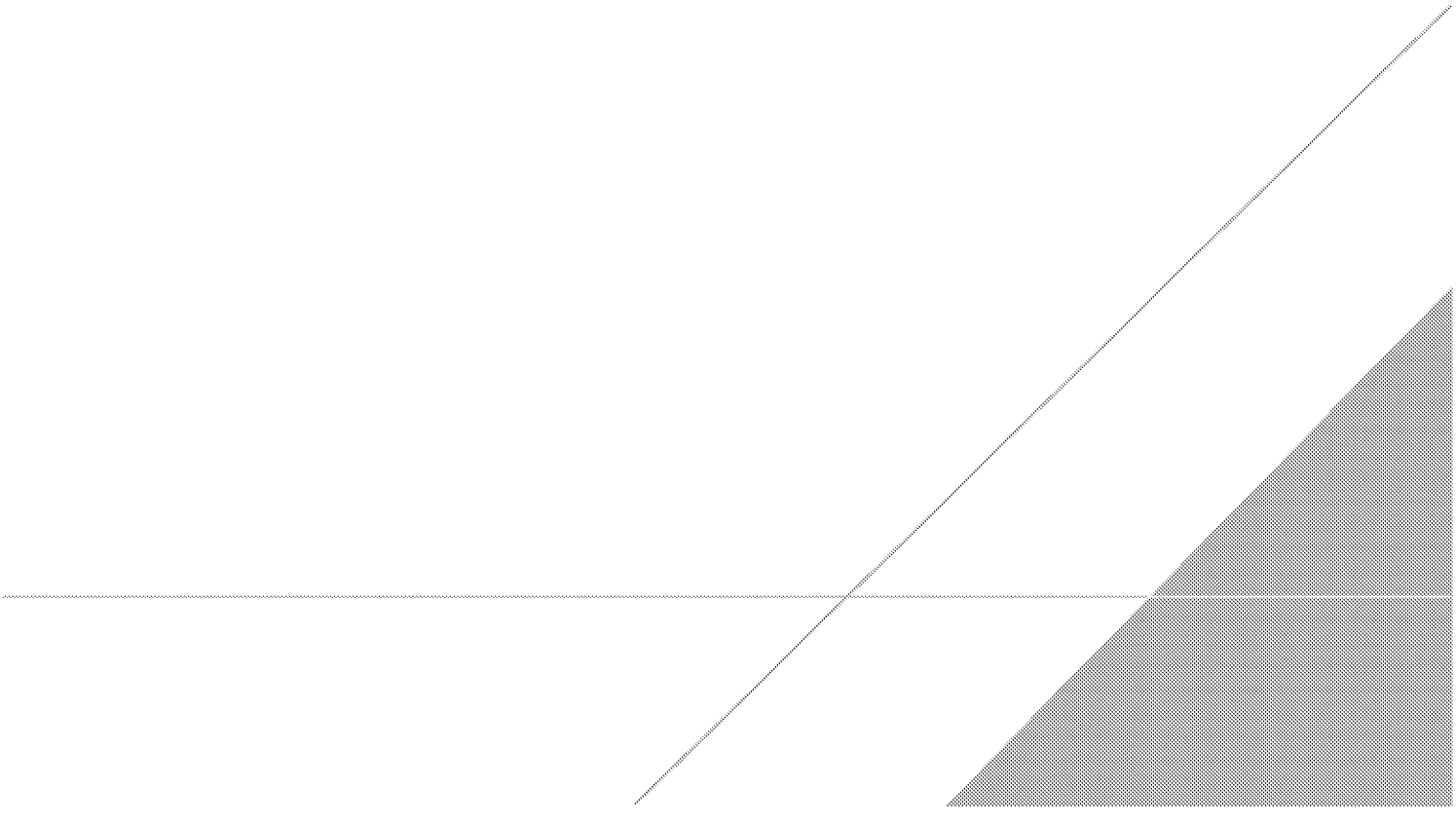
TABLES



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Well ID	Northing	Easting	Total Depth of Borehole (ft bgs)	Well Screen Interval (ft bgs)	Total Depth of Well (ft bgs)	Casing Outer Diameter (inches)	Aquifer/ Location	Downhole Geophysical Assessment Conducted	Geochemical Soil Sampling Conducted
DD-BK	3904768.37	238784.62	85	None	84.5	2	Alluvium / Top of Shale	Y	Y
DD2-BK	3904920.51	238891.40	100	None	99.5	2	Alluvium / Top of Shale	Y	Y

Notes:

Both temporary wells were abandoned immediately following the downhole geophysical assessment

DD-BK = boring designation for location closest to existing well DD

DD2-BK = boring designation for location closest to existing well DD2

ft bgs = feet below ground surface

N = north

Analyte	Method	Supporting Detail and Analysis Goal
Field radioactivity survey (α-β-γ)[a]	Ludlum 2241 ratemeter with 44-9 pancake detector	Analysis of radioactivity in each section of core enabled collection of targeted samples that displayed the highest radioactivity and therefore the highest probability of encountering the disseminated uranium minerals known to be present in the alluvium of the San Mateo Valley.
Total metals in soil[b]	USEPA 3050B with 6020B	Analysis of total metals in soil was necessary to provide an understanding of the geochemical behavior of constituents of concern in the alluvial aquifer and alluvial sediments; this analysis also served as a basis for the leachable metals data generated through the modified USEPA method 1312: SPLP with alkaline extraction.
Leachable metals in soil[c]	Modified USEPA 1312: SPLP with alkaline extraction	Standard SPLP analyses employ an acidic leaching solution, which is not applicable to the San Mateo Valley that exhibits groundwater pH around 8. Additionally, carbonate, a constituent whose concentration is directly dependent on pH, is arguably the most important constituent to uranium(VI) solubility and mobility. This alkaline extraction, based on findings by Kohler et al. 2004, demonstrates how uranium is likely to behave in the San Mateo Valley alluvial aquifer and sediments.
Precise mineralogy	Petrographic analysis	Petrographic analysis via light and polarized light microscopy produces a definitive mineralogic assessment of alluvial aquifer sediments, including identification of small mineral grains, which cannot be resolved through x-ray diffraction.
Mineralogy and elemental composition	SEM analysis with EDX	Scanning electron microscophy with energy dispersive x-ray spectroscopy enabled classification of minerals through gross morphological identification and elemental composition. It also indicated whether elements were part of a crystal structure, or if it was only present as a coating on the mineral's surface or an inclusion within a larger mineral matrix (immobile constituent). SEM-EDS provides a more complete understanding of where the target element most commonly resides within a mineralogical community, whether it is more commonly present as large or small grains, and is essential to characterizing the past, current, and future behavior of a constituent.
Bulk mineralogy	XRD - scan and search	X-ray diffraction analysis provided positive identification of a wide variety of mineral constituents in samples. In contrast to petrographic and SEM-EDS analyses, which requires manual microscopic exploration and targeted identification, XRD is most valuable as a bulk assessment of mineralogy and yields essential data about mineralogic variability throughout the alluvial aquifer. Based on previous characterization of uranium in the San Mateo Valley alluvial system, the majority of the uranium was expected to be encountered in coarse-grained sands and possibly silts; thus, the "scan and search" of XRD method was expected to be sufficient. However, if samples that exhibit the highest uranium are predominantly clay, a directed clay XRD analysis must be used instead.
Grain size	Particle size distribution	Particle size distribution analysis was used to measure the grain sizes of sediment/soil particles a sample. Grain size is the most important factor determining the ability of water to move through an aquifer and can have major effects on residence time and geochemical behavior dependent water-mineral interactions, such as constituent phase (solid or dissolved) and constituent concentration in pore water.

Notes:

[a] Total α-β-γ (alpha-beta-gamma radiation) will be measured to include all possible radiogenic material in the alluvial aquifer

b Will be analyzed for aluminum, calcium, iron, molybdenum, phosphorus, potassium, selenium, sodium, uranium, vanadium

[c] Will be analyzed for molybdenum, selenium, uranium, vanadium

[d] Kohler, M., G.P. Curtis, D.E. Meece, and J.A. Davis. 2004. Methods for Estimating Adsorbed Uranium(VI) and Distribution Coefficients of Contaminated Sediments. Environmental Science and Technology. 38, 240-247.

EDS = energy dispersive x-ray spectroscopy

USEPA = United States Environmental Protection Agency

SEM = scanning electron microscopy

SPLP = Synthetic Precipitation Leaching Procedure

XRD = x-ray diffraction

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							Laboratory	Energy Laboratories, Incorporated		DCM Science Laboratory	ACZ Laboratories
Borehole in Near Upgradient Alluvium	Sample ID	Date (mm/dd/yy)	Time	Depth range (feet below ground surface)	Lithology as Logged in the Field	Field radioactivity survey (α-β-γ) (cpm)	EPA 3050B with 6020B: Total metals in soil[a]	Modified EPA 1312, SPLP, alt. extraction: Leachable metals in soil[b]	Microscopy and spectroscopy[c]	Particle Size Analysis[d]
DD-BK	DD-BK-9-10-012518	01/25/18	1550	9–10	Clay with trace sand	130	X	X	X	X
DD-BK	DD-BK-15-16-012518	01/25/18	1605	15–16	Fine to medium sand with stone and silt	126	X	X	X	X
DD-BK	DD-BK-30-31-012518	01/25/18	1620	30–31	Silty sand and gravel	111	X	X	X	X
DD-BK	DD-BK-36-37-012518	01/25/18	1640	36–37	Clay	104	X	X	X	X
DD-BK	DD-BK-50-51-012518	01/25/18	1710	50–51	Silty fine to coarse sand	90	X	X	X	X
DD-BK	DD-BK-66-67-012518	01/25/18	1725	66–67	Silty fine sand	81	X	X	X	--
DD-BK	DD-BK-27-28-012618	01/26/18	1300	27–28	Fine to coarse sand with trace silt	97	X	X	X	--
DD-BK	DD-BK-39-40-012618	01/26/18	1320	39–40	Silty fine sand with hard layer	72	X	X	X	--
DD-BK	DD-BK-58-59-012618	01/26/18	1330	58–59	Clay	89	X	X	X	--
DD-BK	DD-BK-63-64-012618	01/26/18	1400	63–64	Silty fine sand	66	X	X	X	--
DD2-BK	DD2-BK-11-12-012218	01/22/18	1509	11–12	Gray clay	98	X	X	X	X
DD2-BK	DD2-BK-25-26-012218	01/22/18	1520	25–26	Silty brown sand with calcified layer	97	X	X	X	X
DD2-BK	DD2-BK-51-52-012318	01/23/18	1250	51–52	Silty sand	106	X	X	X	--
DD2-BK	DD2-BK-56-57-012318	01/23/18	1315	56–57	Clay	120	X	X	X	--
DD2-BK	DD2-BK-71-72-012318	01/23/18	1330	71–72	Sand/gravel with some silt	71	X	X	X	X
DD2-BK	DD2-BK-65-66-012318	01/23/18	1420	65–66	Fine sandy silt	107	X	X	X	--
DD2-BK	DD2-BK-36-37-012618	01/26/18	1450	36–37	Silty fine sand	90	X	X	X	X
DD2-BK	DD2-BK-60-61-012618	01/26/18	1505	60–61	Clay	95	X	X	X	--
DD2-BK	DD2-BK-67-68-012618	01/26/18	1535	67–68	Silty sand/clay	84	X	X	X	--
DUP	DUP name: DUP Parent sample: DD2-BK-51-52-012318	01/23/18	1250	51–52	Silty sand	106	X	X	--	--
MS/MSD	Parent sample: DD2-BK-25-26-012218	43122	1520	25–26	Silty brown sand with calcified layer	97	X	--	--	--

[a] Analyzed for aluminum, calcium, iron, molybdenum, phosphorus, potassium, selenium, sodium, uranium, vanadium

[b] Analyzed for molybdenum, selenium, uranium, vanadium

[c] DCM was subcontracted through ELI

[d] Microscopy samples were collected, homogenized in their sample container, and packaged in the field, and were sent to ELI along with the Total metals and Leachable metals samples; all microscopy samples were retained by ELI until Arcadis reviewed data from the Total metals and Leachable metals analyses. Arcadis then selected 8 microscopy samples to be shipped by ELI to DCM for analysis.

[e] A maximum of 5 particle size distribution samples were collected from both DD-BK and DD2-BK; samples covered a range of lithologies (e.g., sand, silt, and clay).

-- = no sample collected/sample not analyzed by this method
X = sample collected
α-β-γ = alpha-beta-gamma radiation
ACZ = ACZ Laboratories in Steamboat Springs, Colorado
DCM = DCM Science Laboratory, Incorporated in Wheat Ridge, Colorado
DD-BK = boring designation for location closest to existing well DD
DD2-BK = boring designation for location closest to existing well DD2
DUP = duplicate measurement/sample
ELI = Energy Laboratories, Incorporated in Casper, Wyoming
EPA = United States Environmental Protection Agency
MS/MSD = matrix spike/matrix spike duplicate; MS/MSD sample volumes are taken from existing samples and do not require a separate sample ID
SPLP = Synthetic Precipitation Leaching Procedure

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Sample ID	Clay (%)	Sand (%)	Silt (%)	Texture	Lithology as Logged in the Field
DD-BK-9-10-012518	45	22.5	32.5	Clay	Clay with trace sand
DD-BK-15-16-012518	10	87.5	2.5	Loamy sand	Fine to medium sand with some silt
DD-BK-30-31-012518	10	80	10	Sandy Loam/Loamy sand	Silty sand and gravel
DD-BK-36-37-012518	47.5	30	22.5	Clay	Clay
DD-BK-50-51-012518	7.5	92.5	U	Sand	Silty fine to coarse sand
DD2-BK-11-12-012218	62.5	7.5	30	Clay	Clay
DD2-BK-25-26-012218	7.5	92.5	U	Sand	Sand with trace silt
DD2-BK-36-37-012618	7.5	87.5	5	Loamy sand	Silty fine sand
DD2-BK-71-72-012318	7.5	92.5	U	Sand	Gravely Sand with some silt

Notes:
Data from ACZ Laboratories, Steamboat Springs, Colorado
% = percent
U = not detected at 0.1% minimum detection limit

ED_004985_00011411-00230

Sample ID	Total metals (mg/kg dry mass)										Synthetic precipitation leaching procedure[a] (mg/L)				Percent moisture	Lithology as Logged in the Field
	Aluminum	Calcium	Iron	Molybdenum	Phosphorus	Potassium	Selenium	Sodium	Uranium	Vanadium	Molybdenum	Selenium	Uranium	Vanadium		
DD-BK-9-10-012518	14500	19800	16600	<1 U	385	2340	<1 U	409	1	26	0.002	0.002	0.0022	<0.01 U	10.1	Clay with trace sand
DD-BK-15-16-012518	3150	954	4530	<1 U	69	487	<1 U	54	<1 U	7	0.002	<0.001 U	0.0018	0.07	2.7	Fine to medium sand with some silt
DD-BK-27-28-012618	1550	566	2740	<1 U	54	366	<1 U	62	<1 U	5	0.004	<0.001 U	0.0012	0.03	0.8	Fine to coarse sand with trace silt
DD-BK-30-31-012518	2750	10400	9340	<1 U	279	547	<1 U	76	<1 U	12	0.005	0.002	0.0032	0.07	1.4	Silty sand and gravel
DD-BK-36-37-012518	8920	20900	9930	<1 U	237	1470	<1 U	143	1	15	0.005	0.005	0.0127	0.1	6	Clay
DD-BK-39-40-012618	2960	6110	7700	1	109	744	<1 U	199	<1 U	9	0.014	0.002	0.007	0.13	3.9	Silty sand with hard layer
DD-BK-50-51-012518	1970	2400	5680	<1 U	211	339	<1 U	118	<1 U	7	0.004	<0.001 U	0.0059	0.06	9.6	Silty fine to coarse sand
DD-BK-58-59-012618	20000	11200	26100	<1 U	432	2890	<1 U	664	1	34	0.003	0.002	0.0032	0.03	19.5	Clay
DD-BK-63-64-012618	4590	9120	6140	<1 U	158	714	<1 U	205	<1 U	11	0.004	0.002	0.0075	0.13	13.1	Silty fine sand
DD-BK-66-67-012518	6870	16100	6670	<1 U	212	831	<1 U	221	<1 U	13	0.006	0.003	0.0118	0.1	14.4	Silty fine sand
DD2-BK-11-12-012218	25300	20300	22200	3	528	4260	<1 U	727	10	34	0.042	0.001	0.179	0.02	21.2	Clay
DD2-BK-25-26-012218	1730	12800	4550	<1 U	174	290	<1 U	77	1	7	0.033	<0.001 U	0.0477	0.03	3.1	Sand with trace silt
DD2-BK-36-37-012618	2700	9140	4810	<1 U	212	503	<1 U	107	<1 U	8	0.009	0.003	0.009	0.06	8.1	Silty fine sand
DD2-BK-51-52-012318	7940	4360	11000	<1 U	336	1370	<1 U	292	2	15	0.002	0.001	0.0086	<0.01 U	18.1	Silty sand
DD2-BK-56-57-012318	23600	20800	20900	<1 U	498	3360	<1 U	695	1	29	0.005	0.002	0.0079	0.05	21	Clay
DD2-BK-60-61-012618	21600	21500	19100	<1 U	512	2920	<1 U	625	2	32	0.005	0.002	0.0086	<0.01 U	23.6	Clay
DD2-BK-65-66-012318	7610	22000	11100	<1 U	372	1300	<1 U	298	1	16	0.007	0.001	0.008	0.12	15.1	Fine sandy silt
DD2-BK-67-68-012618	4530	14600	7940	<1 U	216	889	<1 U	172	1	11	0.007	0.002	0.018	0.12	14.9	Silty sand / Clay
DD2-BK-71-72-012318	2290	42500	42700	1	574	296	2	160	5	20	0.004	0.011	0.0305	0.05	11.5	Gravely sand with some silt

[a] Method is a modified synthetic precipitation leaching procedure as per the method described in Table 2 of this document
mg/kg = milligram per kilogram
mg/L = milligram per liter
U = not detected; method detection limit shown

ED_004985_00011411-00231

Sample Type	Sample name:	DD-BK-9-10-012518	DD2-BK-11-12-012218	DD2-BK-25-26-012218	DD2-BK-51-52-012318	DD2-BK-60-61-012618	DD2-BK-71-72-012318
	Lithology as logged in the field:	CLAY with trace sand	CLAY	SAND with trace silt	Silty SAND	CLAY with trace sand	Gravelly SAND with silt
	Total uranium[a]:	1	10	1	2	2	5
	Leached uranium[a]:	0.0022	0.179	0.0477	0.0086	0.0096	0.0305
	Hydrostratigraphic zone[b]:	unsaturated	unsaturated	unsaturated	saturated	saturated	saturated
Bulk sample	Quartz	38	26	78	54	28	70
	K-Feldspar	9	5	9	10	6	12
	Plagioclase	7	6	5	12	6	8
	Calcite	5	7	3	1	3	3
	Gypsum	-	-	-	-	1	-
	Kaolinite	11	23	-	6	13	1
	Illite/Mica	4	7	3	2	4	3
	Smectite	23	26	-	13	39	1
	Hematite	-	-	-	1	-	1
	Unaccounted	<5	-	<5	<5	-	<5
	Total clay	-	56	-	-	56	-
Clay fraction <2µm	Smectite	--	46	--	--	69	--
	Illite	--	13	--	--	7	--
	Kaolin	--	41	--	--	24	--

All data are from X-Ray Diffraction (XRD) analysis by DCM Science Laboratory in Lakewood, Colorado unless otherwise noted.

[a] Data from Energy Laboratories, Inc. (ELI)

[b] Groundwater was encountered in borehole DD-BK around 45 ft bgs and in DD2-BK around 42 ft bgs

- = not detected above 1 percent

-- = not analyzed

µm = microns

ft bgs = feet below ground surface

ED_004985_00011411-00232

FIGURES

CITY: (DENTECH) DIV/GROUP:(ENV) DB:KGPETERS LD: PIC: PM: TM: DATE: 6/13/2018
PROJECT: PATH: Z:\GISProjects_ENV\AO000120-Grants\GIS\ArcMaps\2018\Figure1_BackgroundAssessmentBorehole.mxd

Legend

Map trace for A-A' cross-section depicted in Figure 2

N

0 1,400 2,800

SCALE IN FEET

Basemap features from: Hydro-Engineering, LLC, 2011

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BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

BACKGROUND ASSESSMENT BOREHOLES

ARCADIS

FIGURE 1

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

A
Southeast

A'
Northeast

Q
(Projected 903')

West
Fault

DD-BK

DD2-BK

SAND & CLAY

SAND & CLAY

GRAVEL

GRAVEL

SHALE BEDROCK

85

100

100.5

West
Fault

ELEVATION - FEET ABOVE MEAN SEA LEVEL

6600
6590
6580
6570
6560
6550
6540
6530
6520
6510
6500
6490
6480
6470

SP/SW - SAND

SM - SILTY SAND

SC - CLAYEY SAND

CH/CL - CLAY

SHALE / BEDROCK

GRAVEL

LITHOLOGY BOUNDARIES DASHED WHERE INFERRED

DD-BK BORING IDENTIFICATION

GROUND SURFACE

105 BOTTOM OF BORING
WELL TOTAL DEPTH

FAULT AND SLIP
DIRECTION

VERTICAL EXAGGERATION = 1:25

0 20' 40'

Vertical Scale: 1 in. = 20 ft.

0 500' 1000'

Horizontal Scale: 1 in. = 1000 ft

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MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

CROSS SECTION A-A'

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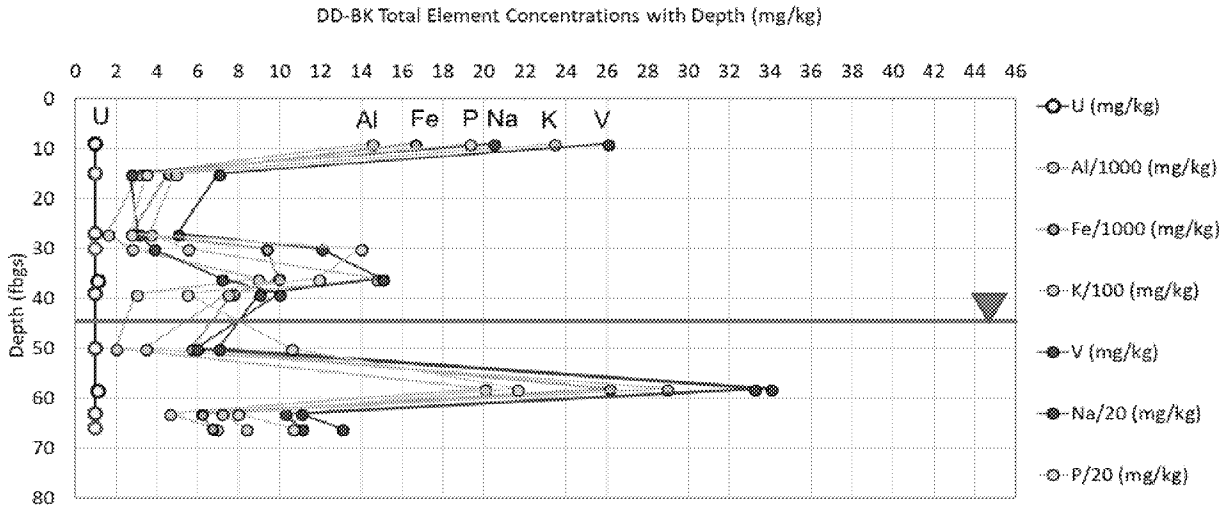
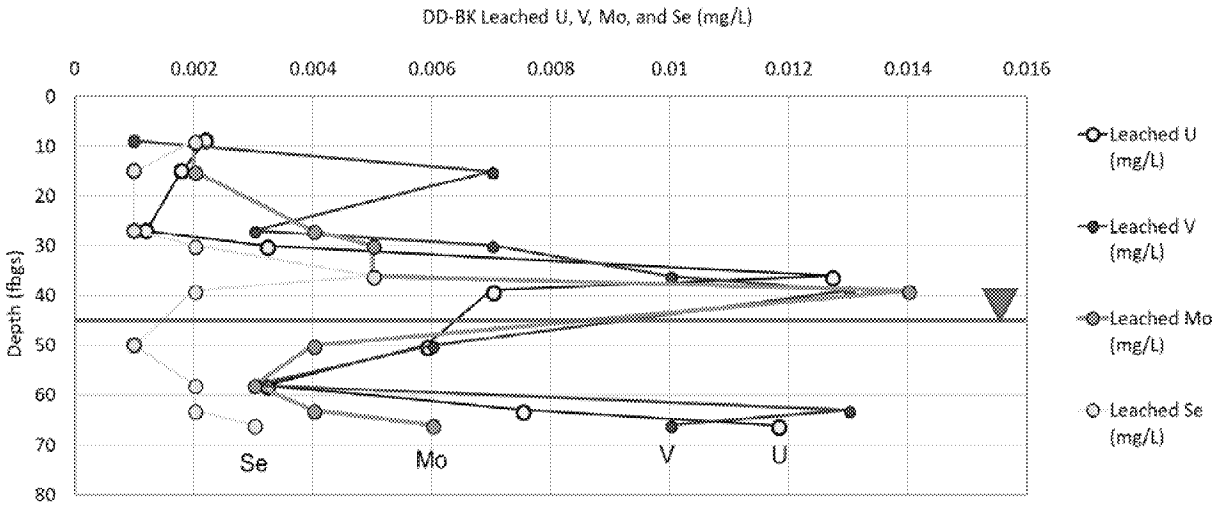
FIGURE
2

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF* ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ACAD.CTB PLOTTED: 6/14/2018 11:33 AM BY: PETERSON, KEITH
E:\SHAWN_XSECTIONS\BarrickMgmt. Section_LAYOUT3.dwg LAYOUT: SECTION A-A' SAVED: 6/14/2018 11:32 AM



A red border circle indicates a non-detect result with a reporting limit of 1 mg/kg



A red border circle indicates a non-detect result

Notes
Al – aluminum
fbgs – feet below ground surface
Fe – iron
K – potassium
mg/kg – milligrams per kilogram
mg/L – milligrams per liter
Mo – molybdenum
Na – sodium
P – phosphorus
Se – selenium
U – uranium
V – vanadium

▼ Groundwater encountered at 45 fbgs

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TOTAL METALS AND LEACHABLE METALS RESULTS FROM BOREHOLE DD-BK

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FIGURE 3

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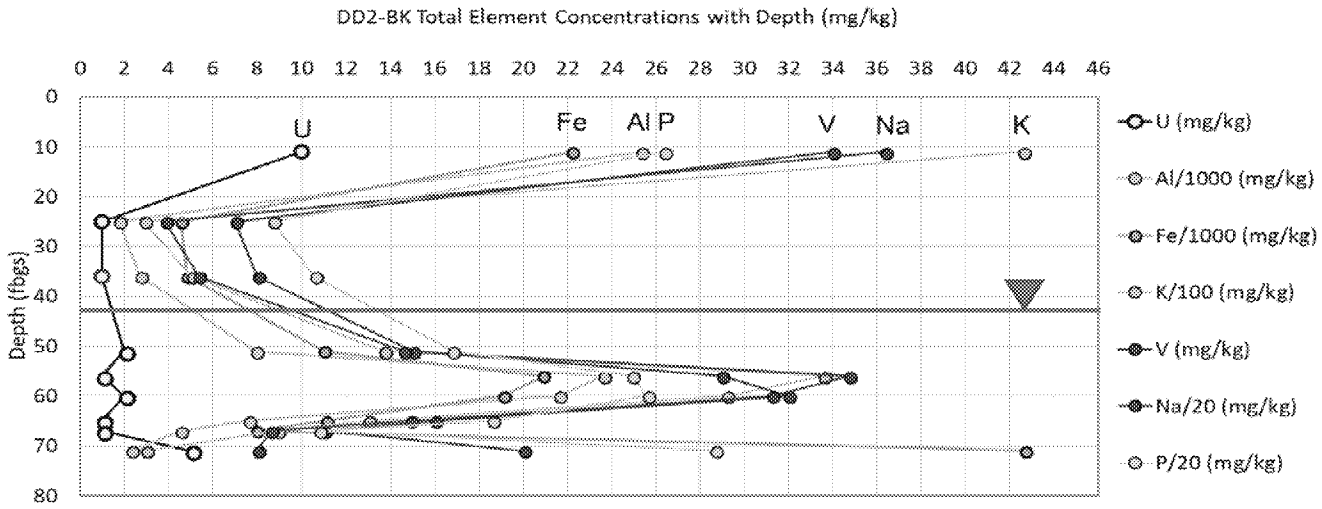
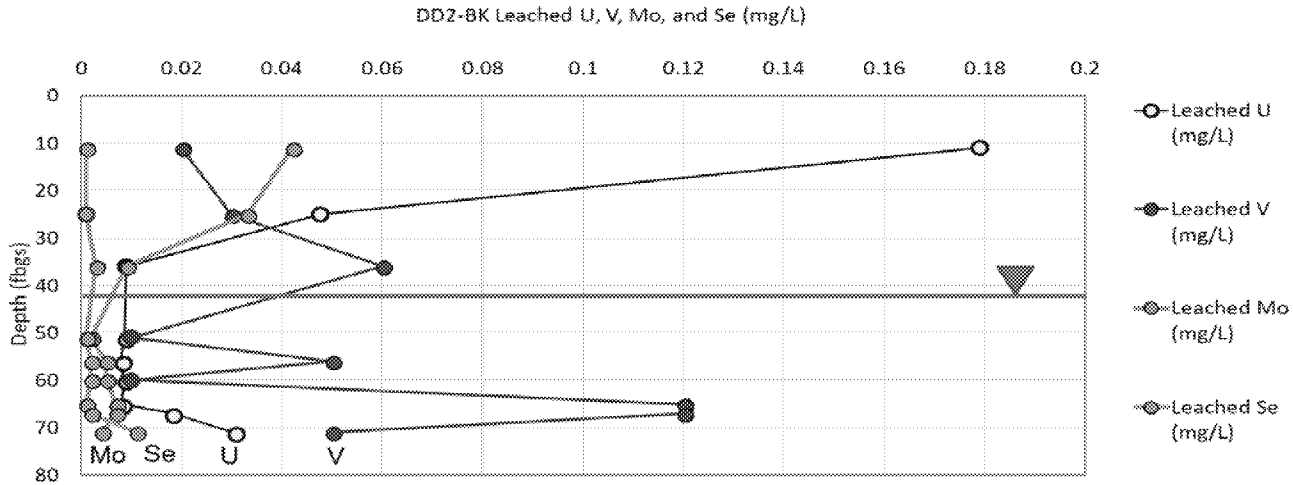


A red border circle indicates a non-detect result with a reporting limit of 1 mg/kg



A red border circle indicates a non-detect result

Notes
Al – aluminum
fbgs – feet below ground surface
Fe – iron
K – potassium
mg/kg – milligrams per kilogram
mg/L – milligrams per liter
Mo – molybdenum
Na – sodium
P – phosphorus
Se – selenium
U – uranium
V – vanadium

▼ Groundwater encountered at 42 fbgs

HOMESTAKE MINING COMPANY
GRANTS RECLAMATION PROJECT
BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

TOTAL METALS AND LEACHABLE METALS RESULTS FROM BOREHOLE DD2-BK

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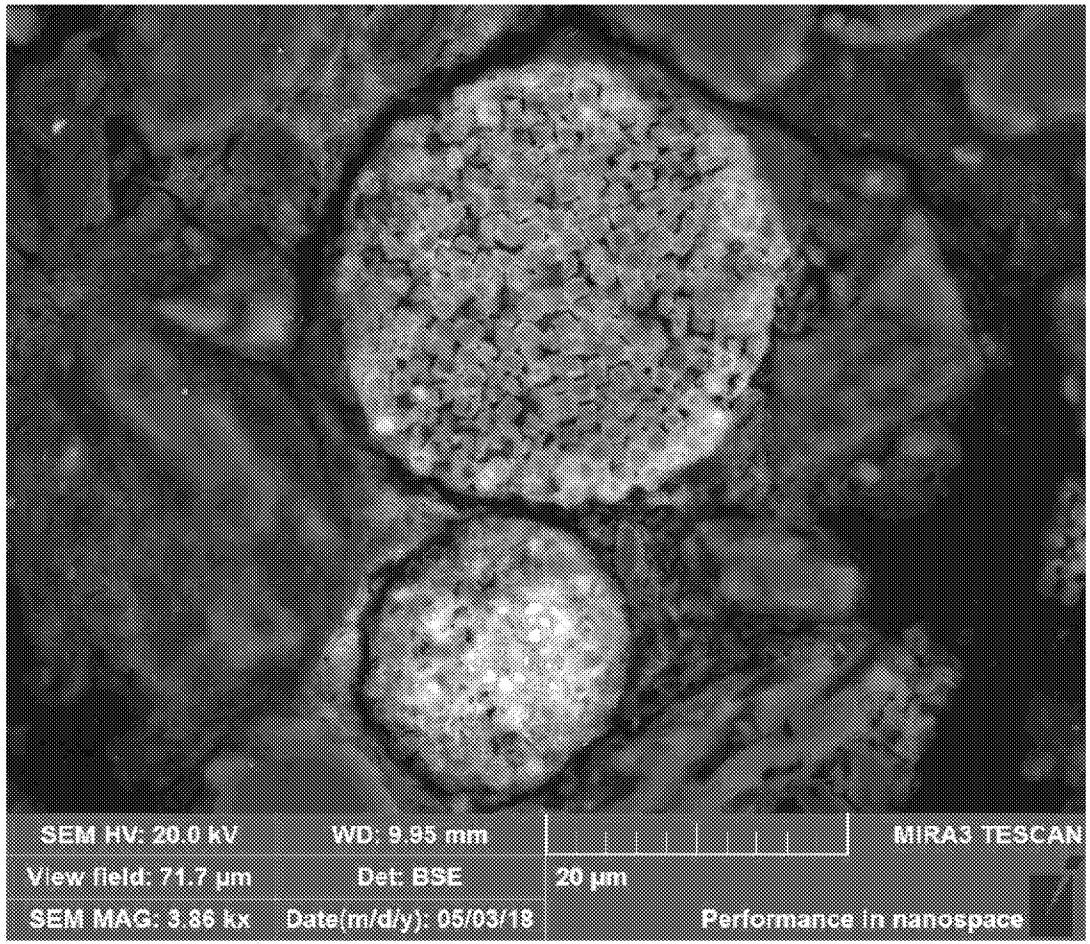
FIGURE 4

ED_004985_00011411-00237



Client Sample No.: **DD2-BK-51-52-012318**

Backscatter image of iron oxide pseudomorphs after pyrite framboids sit in a matrix of clay with quartz/feldspar grains. The smaller pseudomorph contains bright relict pyrite – 3,860X.

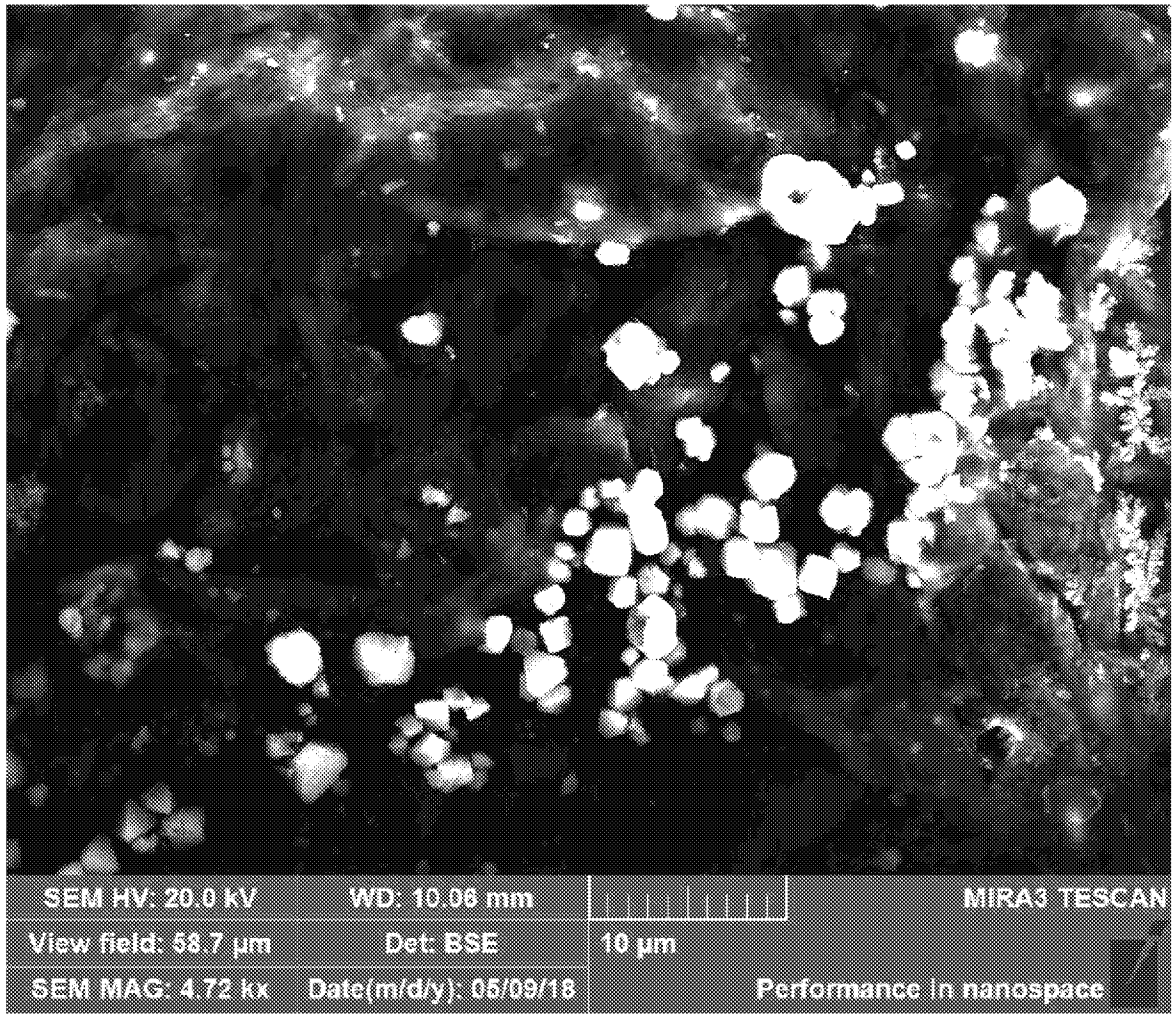
Notes
µm – microns
BSE – backscatter electron detector
HV – high voltage
kx – thousand times magnification
kV – kilovolts
m/d/y – month/day/year
mm – millimeters
WD – working distance
X – times magnified

HOMESTAKE MINING COMPANY
GRANTS RECLAMATION PROJECT
BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

IRON OXIDE PSEUDOMORPHS OF PYRITE FRAMBOIDS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5



Client Sample No.: **DD2-BK-60-61-012618**

Backscatter image of a clay pocket filled with cubes of halite – 4,720X.

Notes
µm – microns
BSE – backscatter electron detector
HV – high voltage
kx – thousand times magnification
kV – kilovolts
m/d/y – month/day/year
mm – millimeters
WD – working distance
X – times magnified

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BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

HALITE CRYSTALS IN A CAVITY

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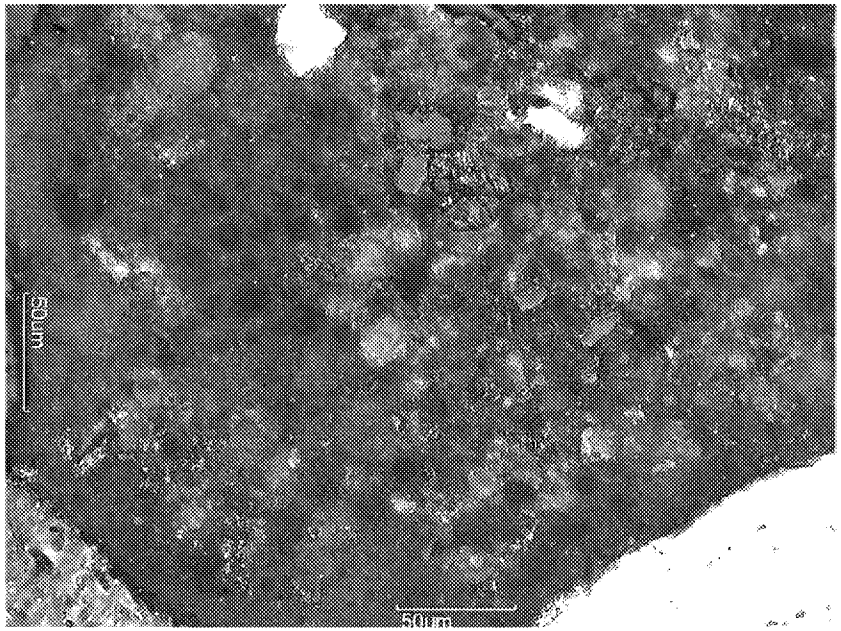
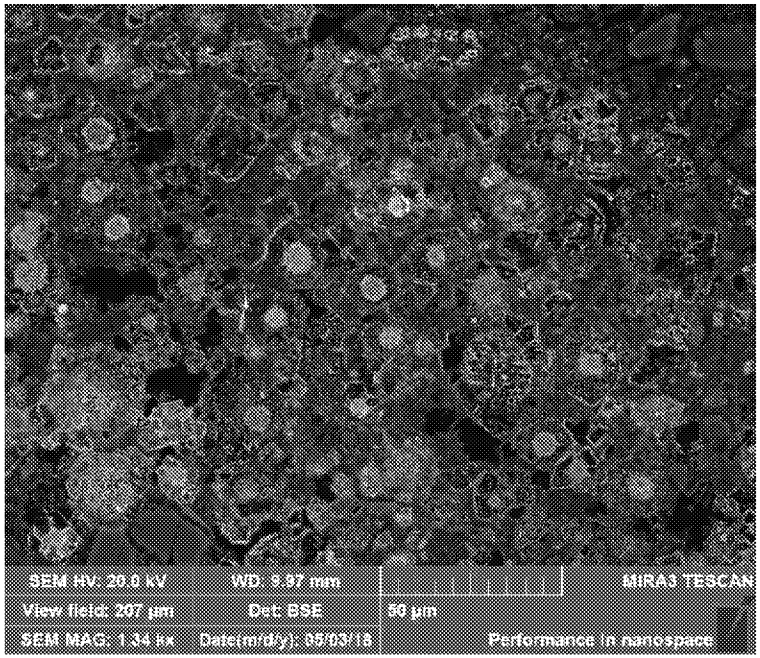
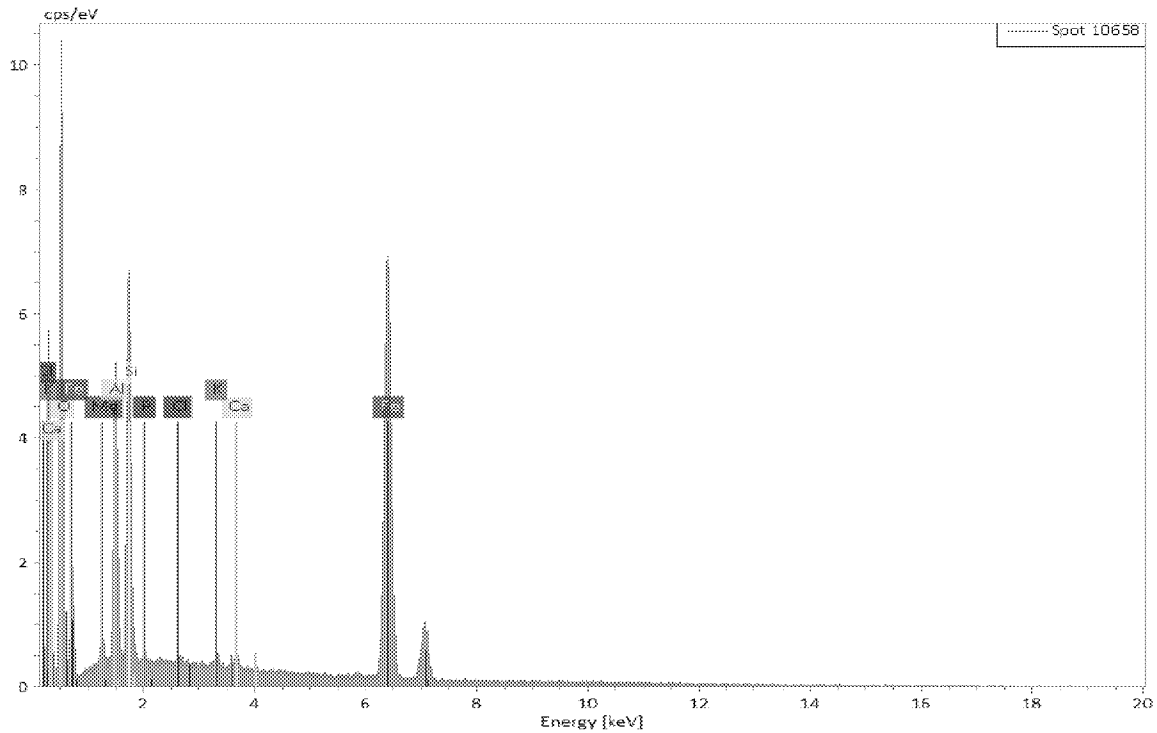
FIGURE 6



Client Sample No.: **DD2-BK-25-26-012218**
Iron oxide pseudomorphs after pyrite and pyrite framboids. Reflected light crossed Nichols – 200X.



Client Sample No.: **DD2-BK-25-26-012218**
Backscatter image of iron oxide pseudomorphs after pyrite cubes and framboids – 1,340X.



Notes
µm – microns
BSE – backscatter electron detector
cps/eV – count per second per electron volt
HV – high voltage
keV - kiloelectronvolt
kx – thousand times magnification
kV – kilovolts
m/d/y – month/day/year
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WD – working distance
X – times magnified

HOMESTAKE MINING COMPANY
GRANTS RECLAMATION PROJECT
BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

MASSIVE COLLECTION OF IRON OXIDE PSEUDOMORPHS OF PYRITE FRAMBOIDS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7

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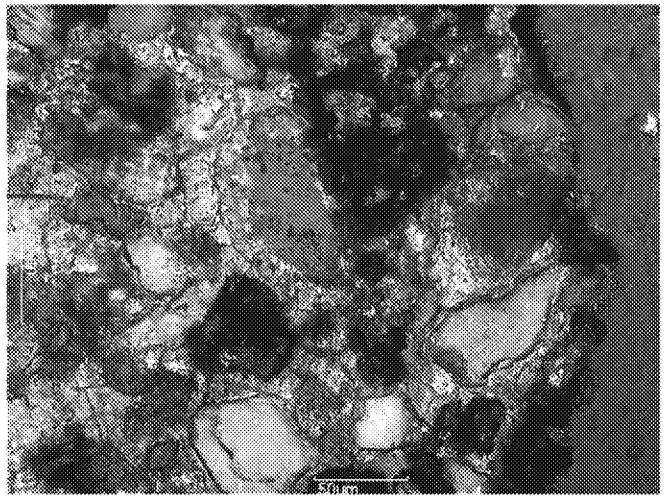
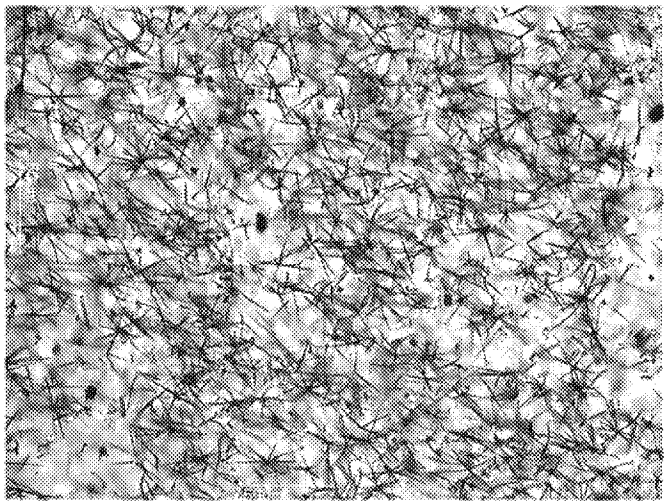


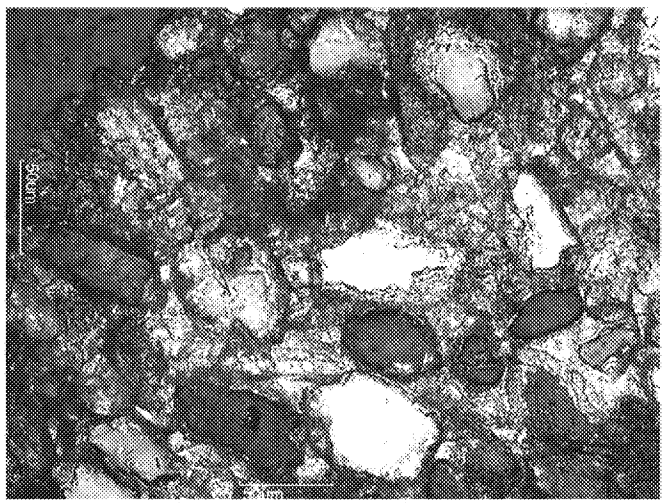
Client Sample No.: **DD2-BK-25-26-012218**

Calcite and iron oxide cement quartz/feldspar grains. Reflected light crossed Nichols – 200X.



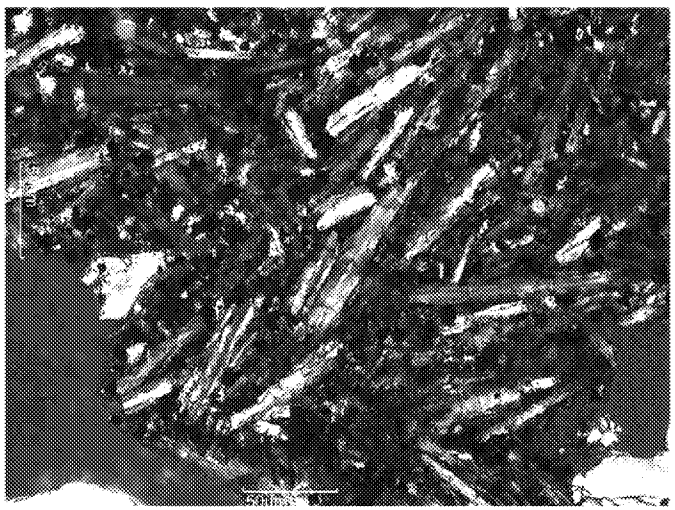
Client Sample No. **DD2-BK-25-26-012218**

Isotropic volcanic glass riddled with unknown opaque, acicular crystallites. Polarized light – 250X.



Client Sample No.: **DD2-BK-71-72-012318**

Calcite and iron oxide cement quartz/feldspar grains. Reflected light crossed Nichols – 200X.



Client Sample No.: **DD2-BK-71-72-012318**

Fragment of basalt showing lath shaped plagioclase. Polarized light – 200X.

Notes

X – times magnified

HOMESTAKE MINING COMPANY

GRANTS RECLAMATION PROJECT

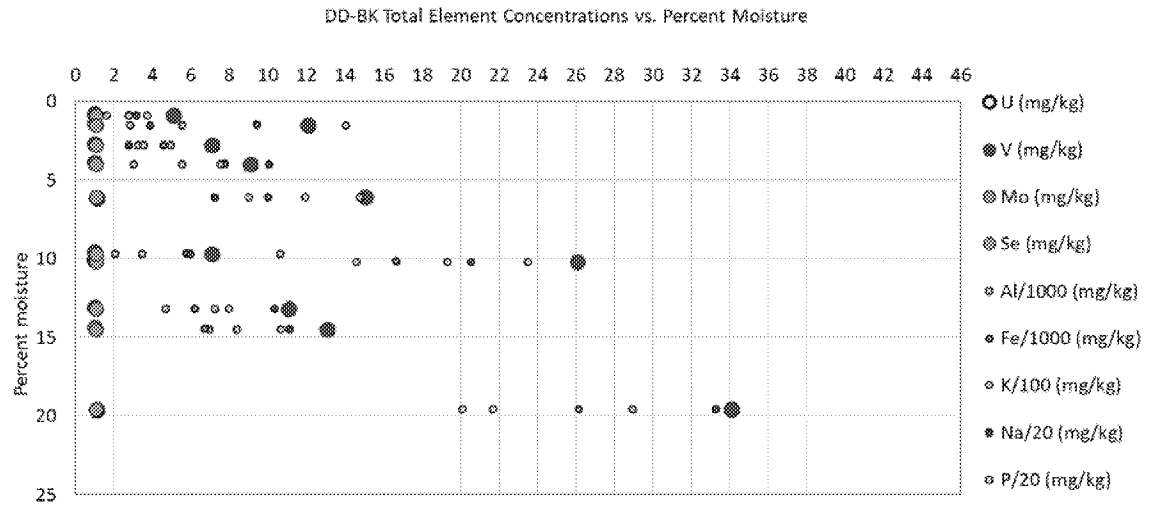
BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

MINERALOGICAL CONSORTIA SHOWING QUARTZ, FELDSPAR, AND OTHER IGNEOUS MINERALOGY

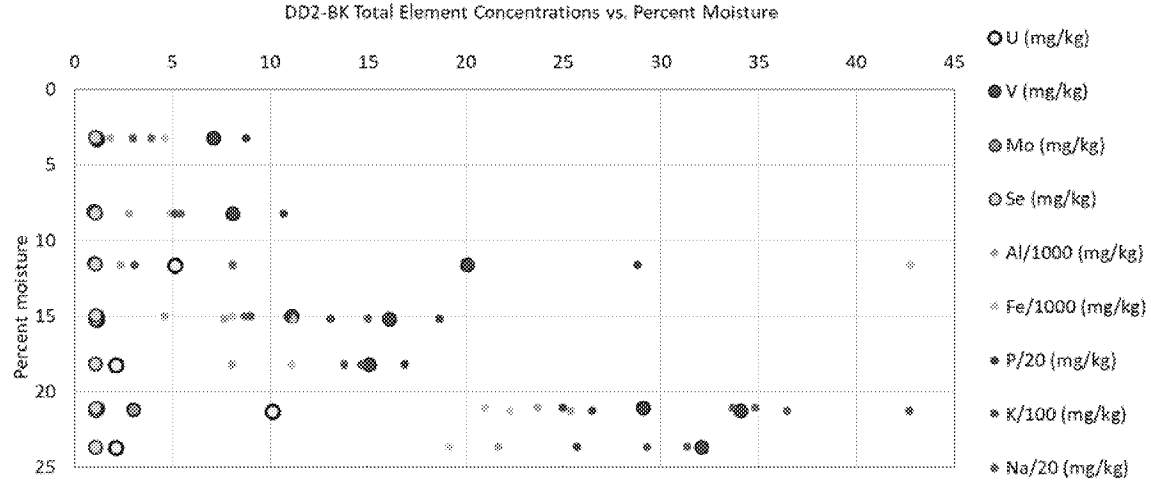
ARCADIS Design & Consultancy for natural and built assets

FIGURE 8

ED_004985_00011411-00241



A red border circle indicates a non-detect result with a reporting limit of 1 mg/kg



Notes
Al – aluminum
Fe – iron
K – potassium
mg/kg – milligrams per kilogram
Mo – molybdenum
Na – sodium
P – phosphorus
Se – selenium
U – uranium
V – vanadium

HOMESTAKE MINING COMPANY
GRANTS RECLAMATION PROJECT
BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

THE EFFECT OF PERCENT MOISTURE

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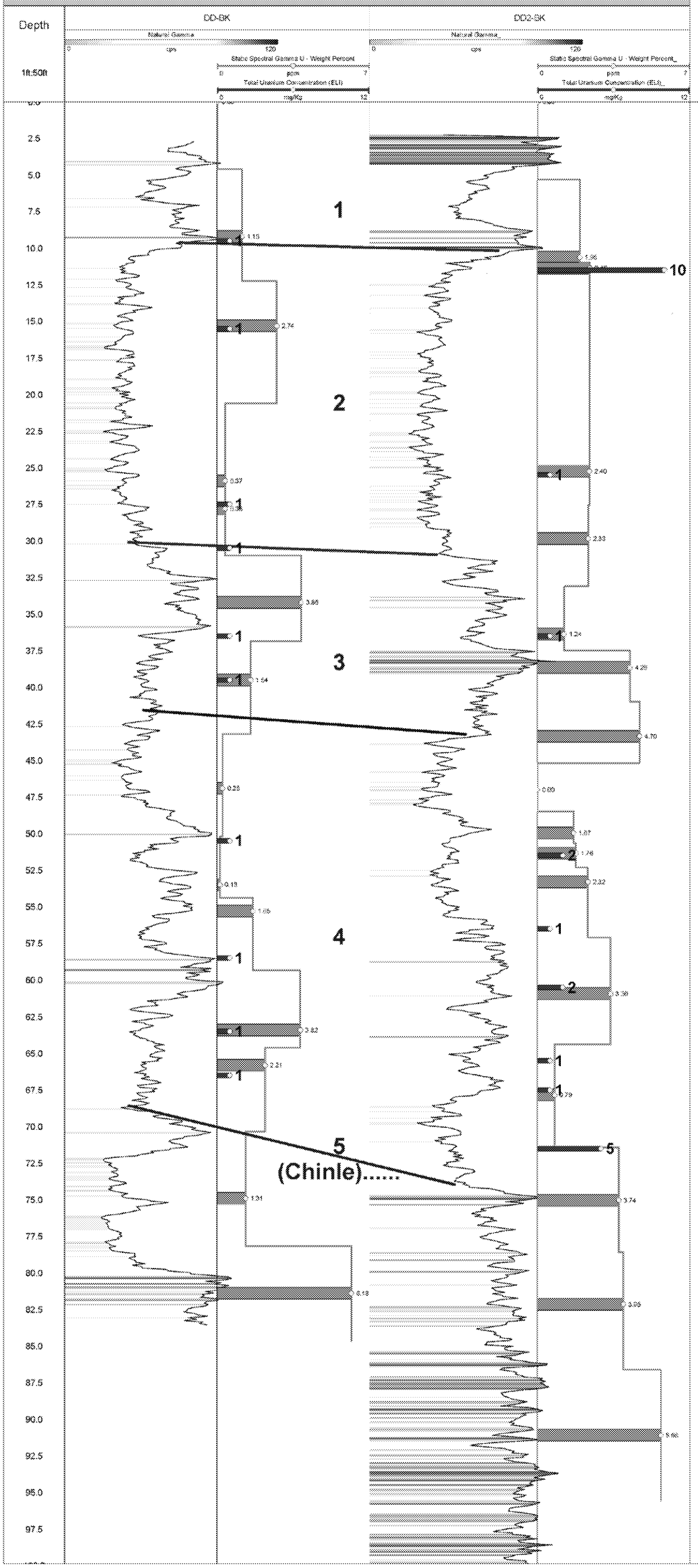
FIGURE 9

ED_004985_00011411-00242

COMPARISON BETWEEN DD-BK AND DD2-BK NATURAL GAMMA LOGS



HOMESTAKE MINING COMPANY
GRANTS RECLAMATION PROJECT
BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

COMPARISON BETWEEN DD-BK AND DD2-BK NATURAL GAMMA LOGS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 10

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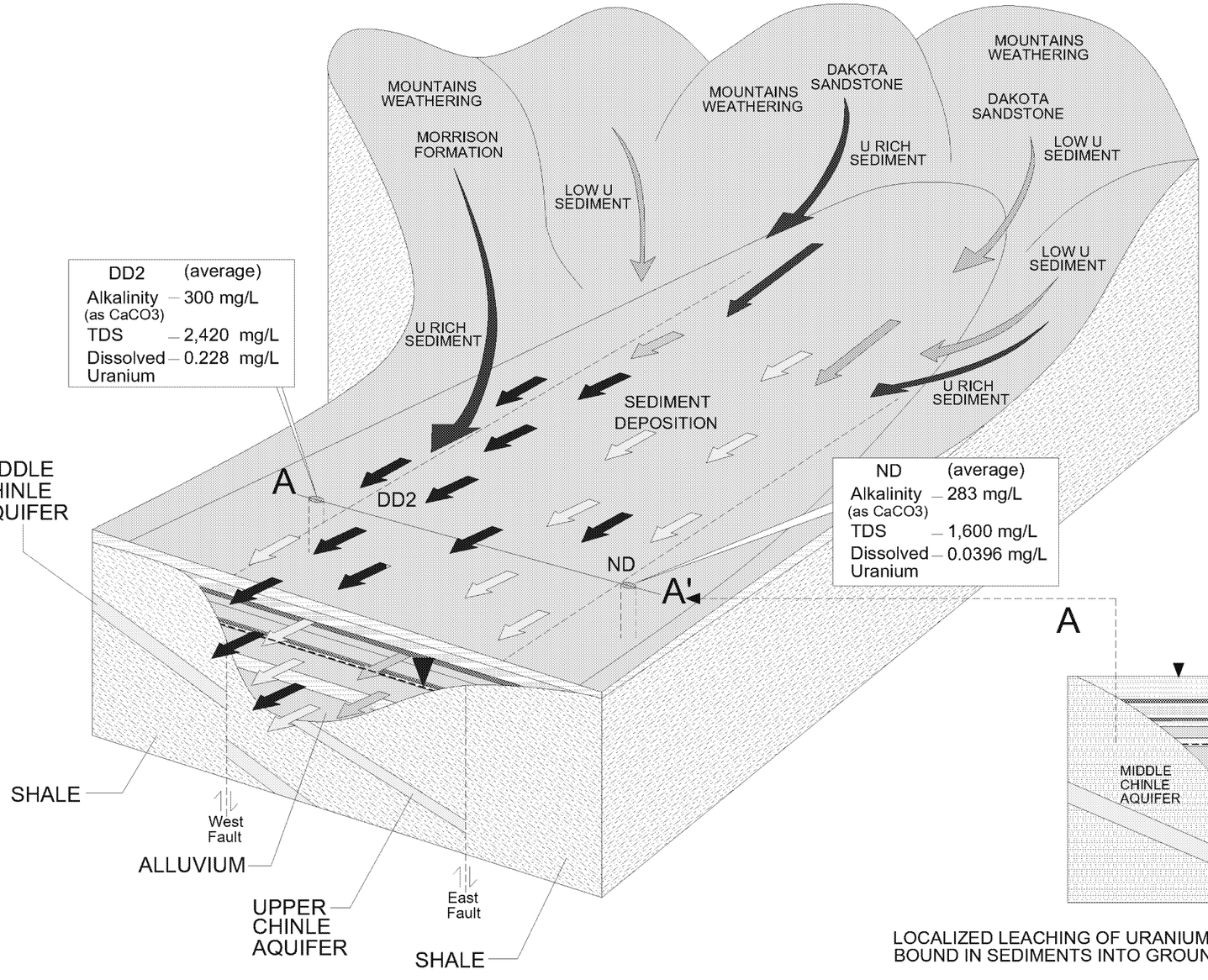
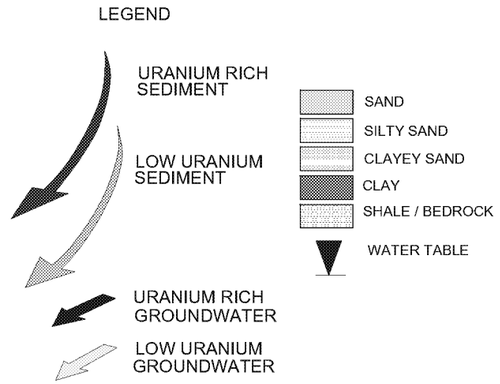
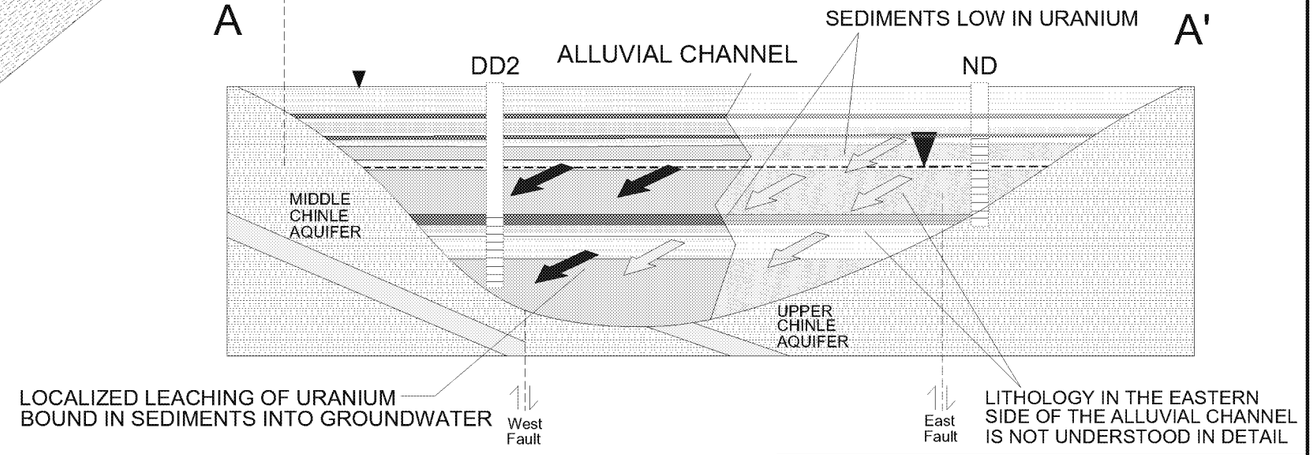






OMESTAKE MINING COMPANY
GRANTS RECLAMATION PROJECT
BACKGROUND BOREHOLE DEVELOPMENT, MINERALOGY AND GEOPHYSICS ASSESSMENT REPORT

CONCEPTUAL SITE MODEL FOR URANIUM TRANSPORT

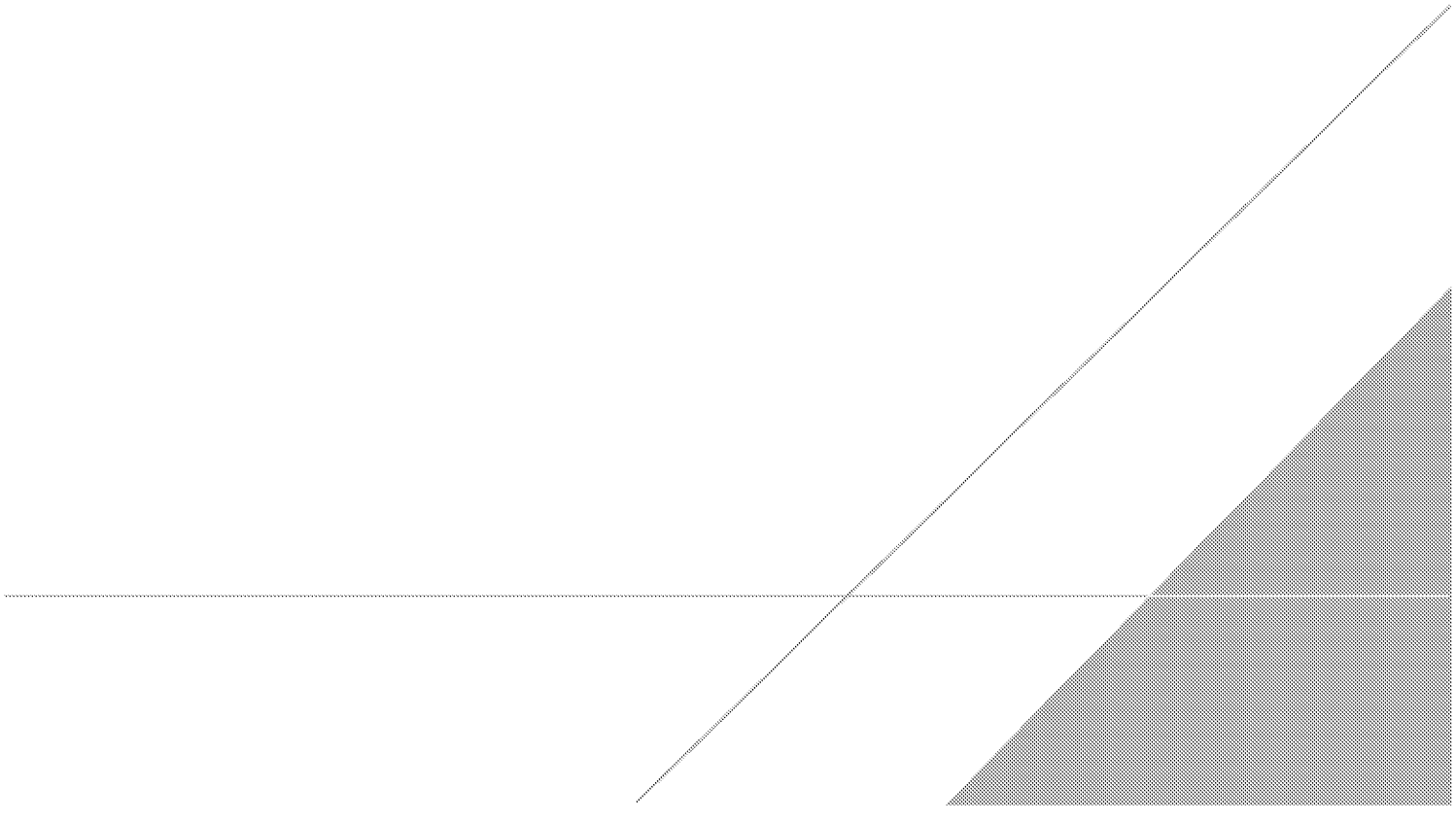
ARCADIS Design & Consultancy for natural and built assets

FIGURE
1111

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PW:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
E:\Grants_Shawn\Erosion_Section_trans.dwg LAYOUT: SECTION A-A' SAVED: 5/16/2018 2:30 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ACAD.CTB PLOTTED: 5/16/2018 2:31 PM BY: PETERSON, KEITH

APPENDIX A

Drilling Logs



LITHOLOGIC LOGS FOR VARIOUS TEST HOLES (CONT.)

DEPTH INTERVAL (FT)	DESCRIPTION
	WELL AA
0-6	Fine to Medium Light Colored Blow Sand
6-11	Darker Colored Medium Sand w/small fragments of Light Colored Clay
11-20	Medium Grained Dark Colored Sand w/small fragments of Malpais Lava. Small amounts of Buff Colored Clay.
21-33	Medium Grained Well Sorted Lighter Colored Sand with Lava Fragments and Chert.
35-46	Medium Grained Light Colored Sand
47-60	Bright Red Clay grading to Purpler Color @ 60'-believe this to be Chinle Clay; however, questionable contact (see notes for hole DD) 60' of 4" PVC casing w/lower 20' perforated.
	WELL DD
0-4.5	Fine to Medium Grained Light Colored Blow Sand
4.5-6	Dark Colored Fine Grained Sand-small amounts of Clay
6-32	Fine to Medium Grained, Well Sorted Sand
33-45	Red Clay & Coarse Sand or Gravel (originally thought to be Chinle Clay; however, clay layer is only 10-12' thick. This is probably the same clay layer that was mistakenly identified as Chinle Clay in hole AA).
45-56	Medium Grained Well Sorted, Light Colored Sand

LITHOLOGIC LOGS FOR VARIOUS TEST HOLES (CONT.)

DEPTH INTERVAL (FT)	DESCRIPTION
	WELL DD (CONT.)
56-60	Red Clay w/Coarse Gravel
60-65	Medium to Fine Grained Sand
65-73	Coarse Sand & Gravel w/Red Clay
75-83	Coarser Sand and Gravel w/small amounts of Chert & Limestone fragments. Contact w/Chinle Clay @ 83'. 80' of 4" PVC casing with lower 40' perforated.
	WELL Z
0-5	White to Gray Colored Fine Grained Sand w/small amounts of Dark Clay
5-12	Fine to Medium Buff Colored Sand, decreasing amounts of Clay
15-35	Fine Grained Tan Colored Sand small amounts of Red Colored Clay
35-50	Medium Grained Tan Sand Less Clay
50-65	Medium Sand-Small amounts Dark Clay
65-68	Coarse Sand-Malpais Lava fragments
68	Chinle contact. 75' casing including 5' tailpiece & 10' no. 40 slot PVC screen- centering guides.
	Well Y
0-12	Fine to Medium Sand w/small amounts of Buff Colored Clay
12-22	Grading into Medium Sandy still some Buff Colored Clay.
22-40	Medium Sand
40-50	Fine to Medium Sand
50-57	Med. to Coarse Sand w/broken fragments of Malpais Lava. Contact w/Chinle Clay @ 57' 60' 4" PVC, lower portion: 5' tailpiece, 5' #40 slot PVC screen, centering guides

STATE ENGINEER OFFICE

WELL RECORD

DD2

Section 1. GENERAL INFORMATION

(A) Owner of well HOMESTAKE MINING CO. Owner's Well No. DD2

Street or Post Office Address

City and State

Well was drilled under Permit No. and is located in the:

a. ¼ ¼ ¼ ¼ of Section Township Range N.M.P.M.

b. Tract No. of Map No. of the

c. Lot No. of Block No. of the Subdivision, recorded in County.

d. X= feet, Y= feet, N.M. Coordinate System Zone in the Grant.

(B) Drilling Contractor COYOTE DRILLING INC. License No. WD -1451

Address

Drilling Began 5-9-08 Completed 5-9-08 Type tools 3 cone bit Size of hole 9 7/8 in.

Elevation of land surface or at well is ft. Total depth of well 90 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 45 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
75	80	5	sand & gravel	2 gpm

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
5"	PVC	none	0.	90	90	PVC CAP	50	90

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor

Address

Plugging Method

Date Well Plugged

Plugging approved by:

State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad FWL FSL

File No. Use Location No.

TD-004025-00011411-00248

From	To	Thickness in Feet	Color and Type of Material Encountered
0	10	10	brown clay
10	20	10	sand & gravel
20	70	50	red & gray shale
70	80	10	sand & gravel
80	90	10	gray shale

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

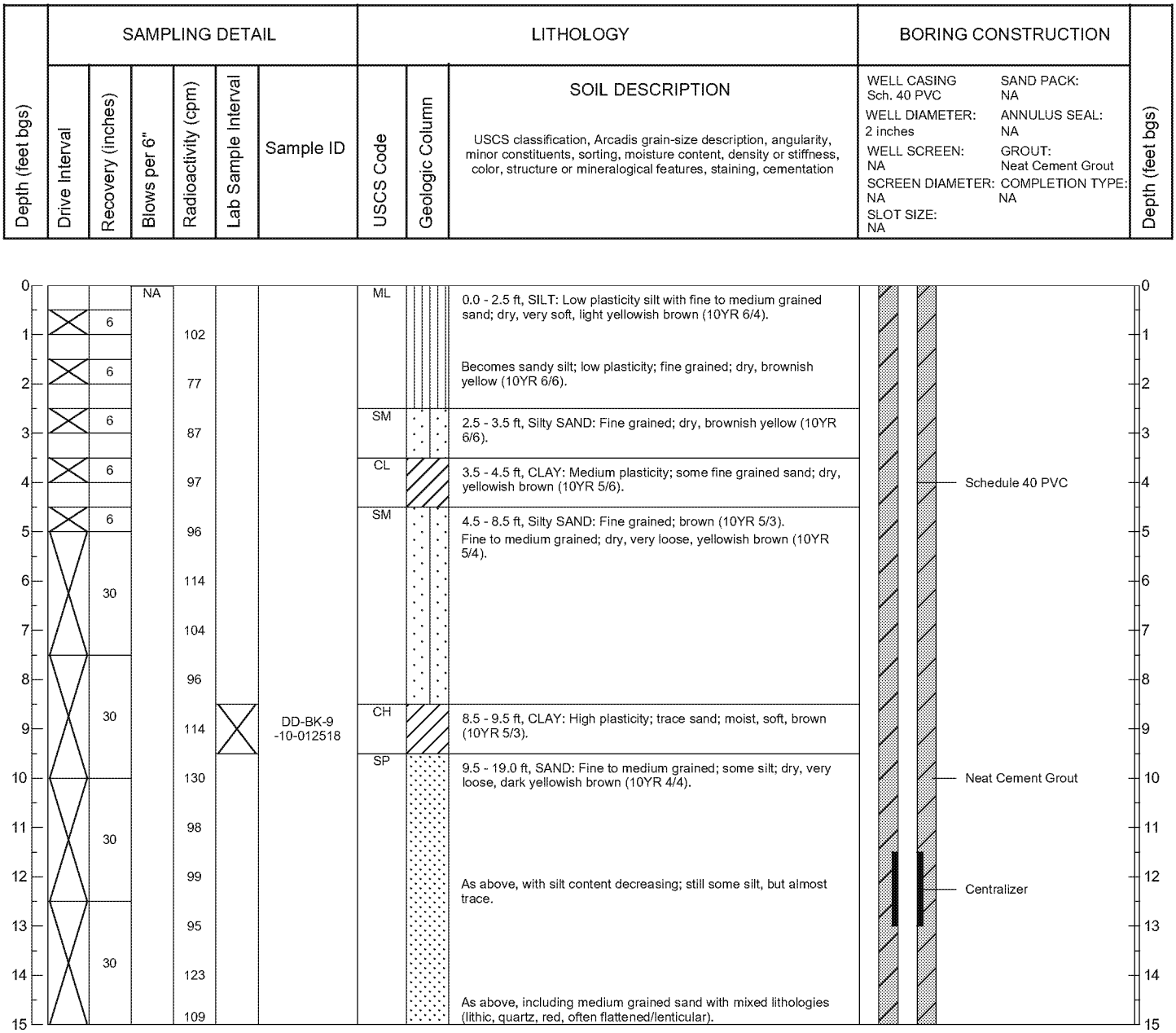
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

ED_004985_00011411-00249

ARCADIS Boring and Well Construction Log

Date Drilling Started:	1/24/2018	**Northing:** 3904768.37	**Easting:** 238784.62	**DD-BK**	
Date Drilling Finished:	1/25/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/25/2018	**Total Borehole Depth:**	85.0 feet bgs		
Drilling Company:	Cascade Drilling, LLC	**Borehole Diameter:**	6 in./4 in.	**Client:**	Homestake Mining Company
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376



Abbreviations: bgs = below ground surface, NA = not available/not applicable, cpm = counts per minute, ft = feet, PVC = polyvinyl chloride, USCS = Unified Soil Classification System, in = inches, mm = millimeters, < = less than, % = percent

Notes:

Radioactivity measured using 2241 ratemeter with a 44-9 detector, sensitive to alpha-beta-gamma(a·ß·?) radiation Radioactivity background 74 counts per minute (cpm). Visqueen background 133 cpm at 5 feet bgs and 149 cpm at 17 feet bgs. 6-inch diameter borehole to 75 feet bgs. 4-inch diameter borehole from 75 feet bgs to total depth. Well abandoned on 1/26/2018 by cutting casing off at 3 feet bgs and filling remaining borehole with neat cement grout, approximately 20 gallons installed, at 1 bag of cement to 3 gallons of water ratio.

ARCADIS Boring and Well Construction Log

Date Drilling Started:	1/24/2018	**Northing:** 3904768.37	**Easting:** 238784.62	**DD-BK**	
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Date Well Complete:	1/25/2018	**Total Borehole Depth:**	85.0 feet bgs		
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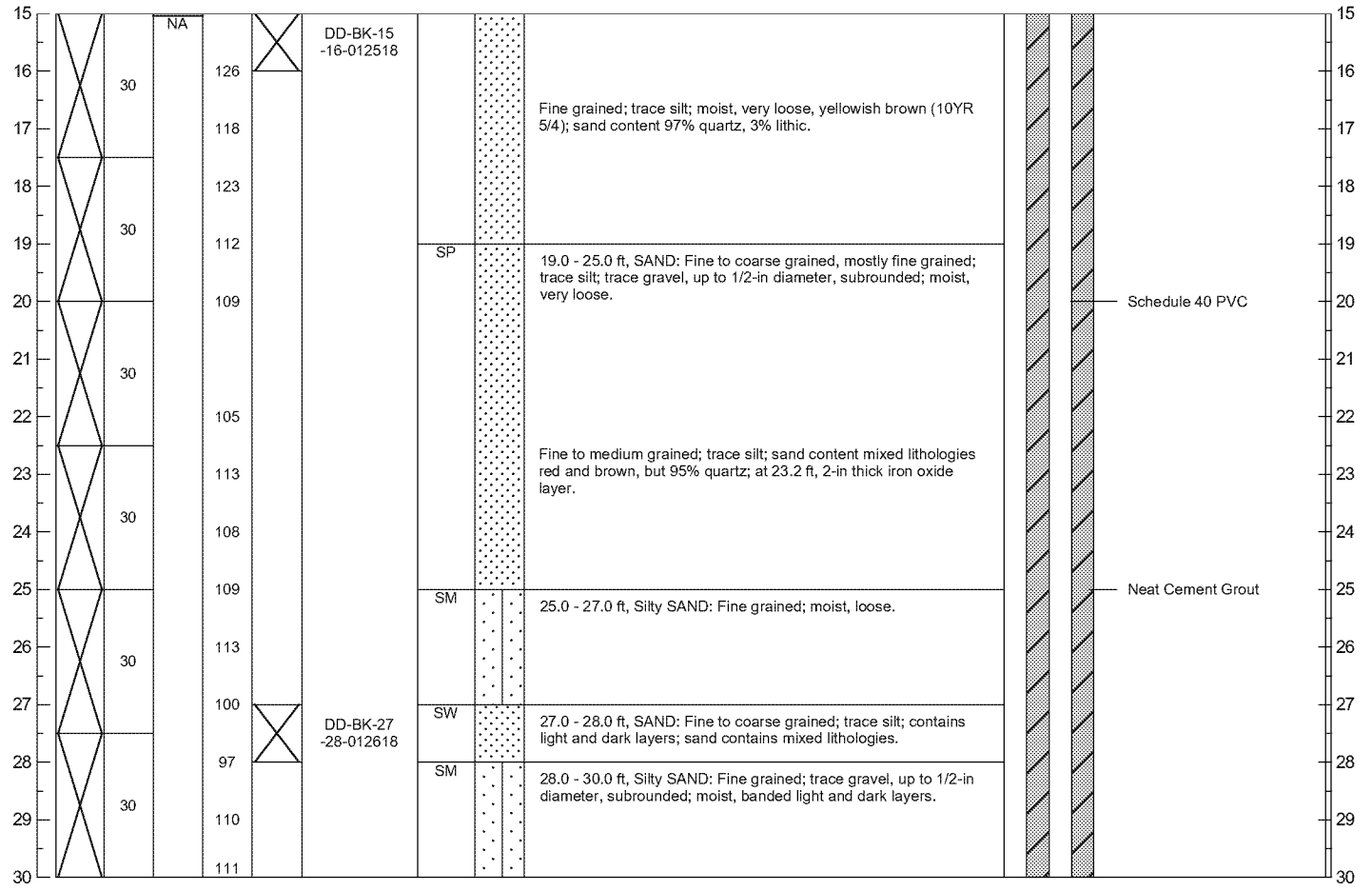
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376



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ARCADIS Boring and Well Construction Log

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Date Drilling Finished:	1/25/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/25/2018	**Total Borehole Depth:**	85.0 feet bgs		
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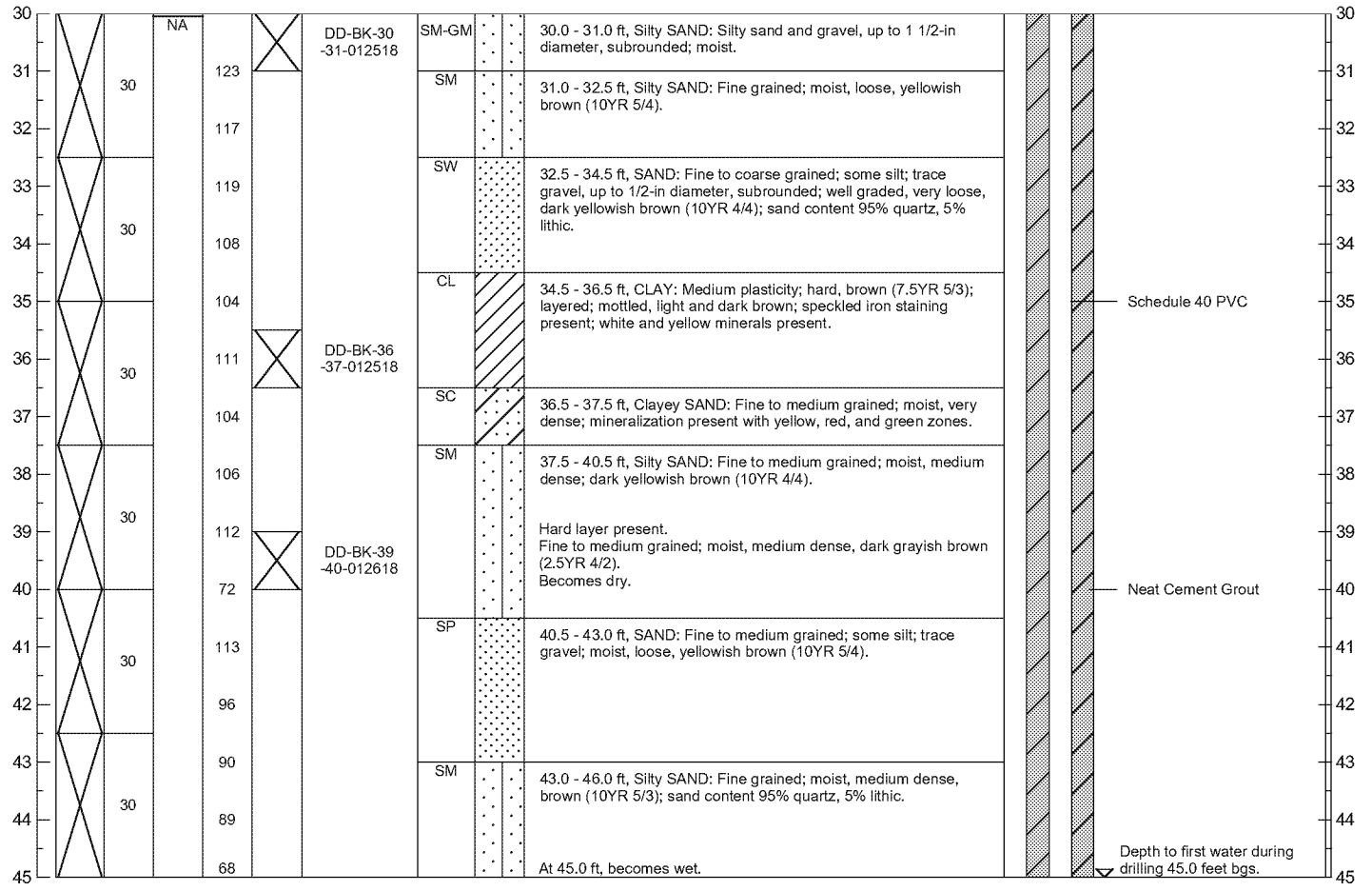
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376



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ARCADIS Boring and Well Construction Log

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Date Well Complete:	1/25/2018	**Total Borehole Depth:**	85.0 feet bgs		
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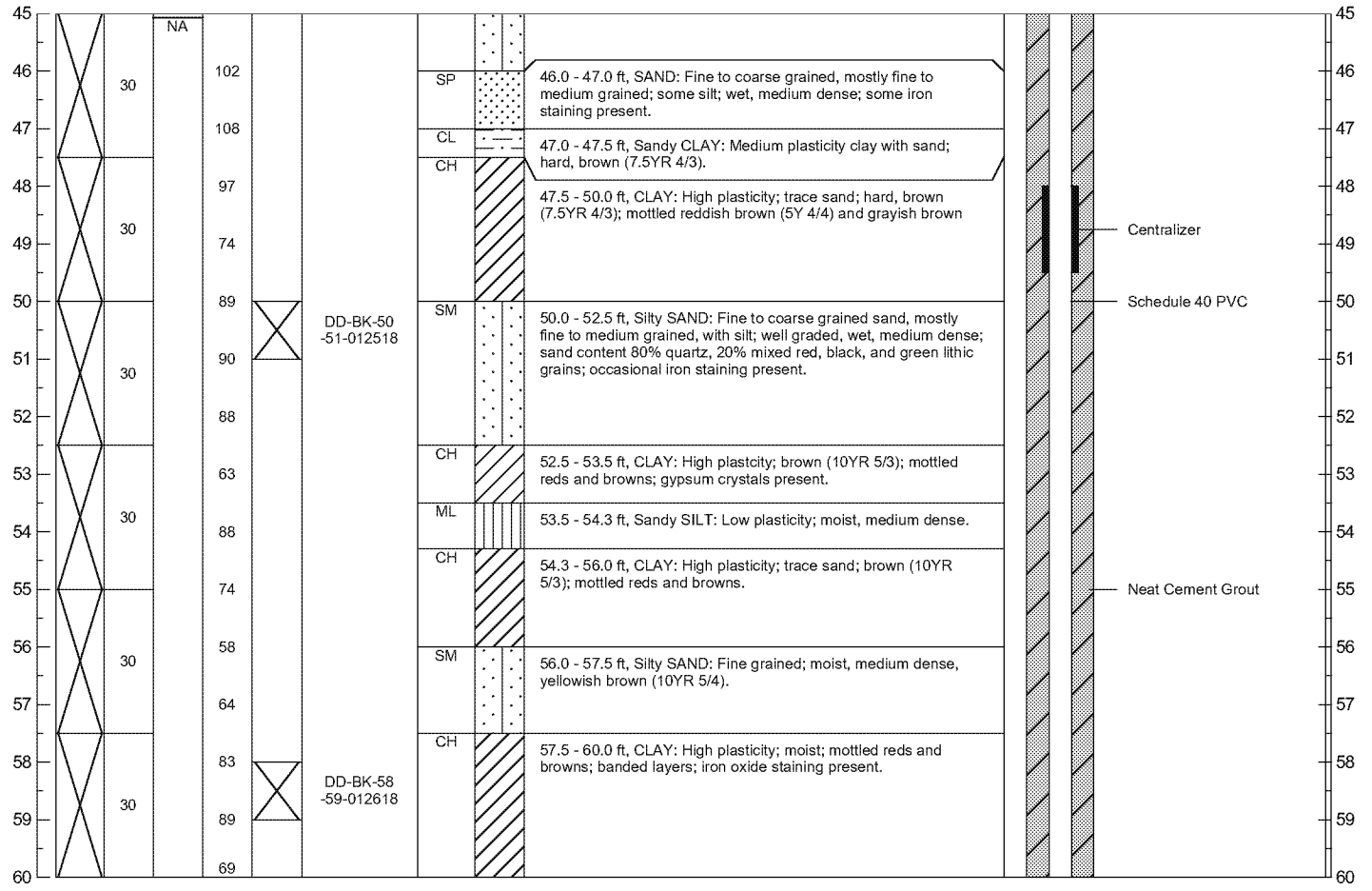
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376



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ARCADIS Boring and Well Construction Log

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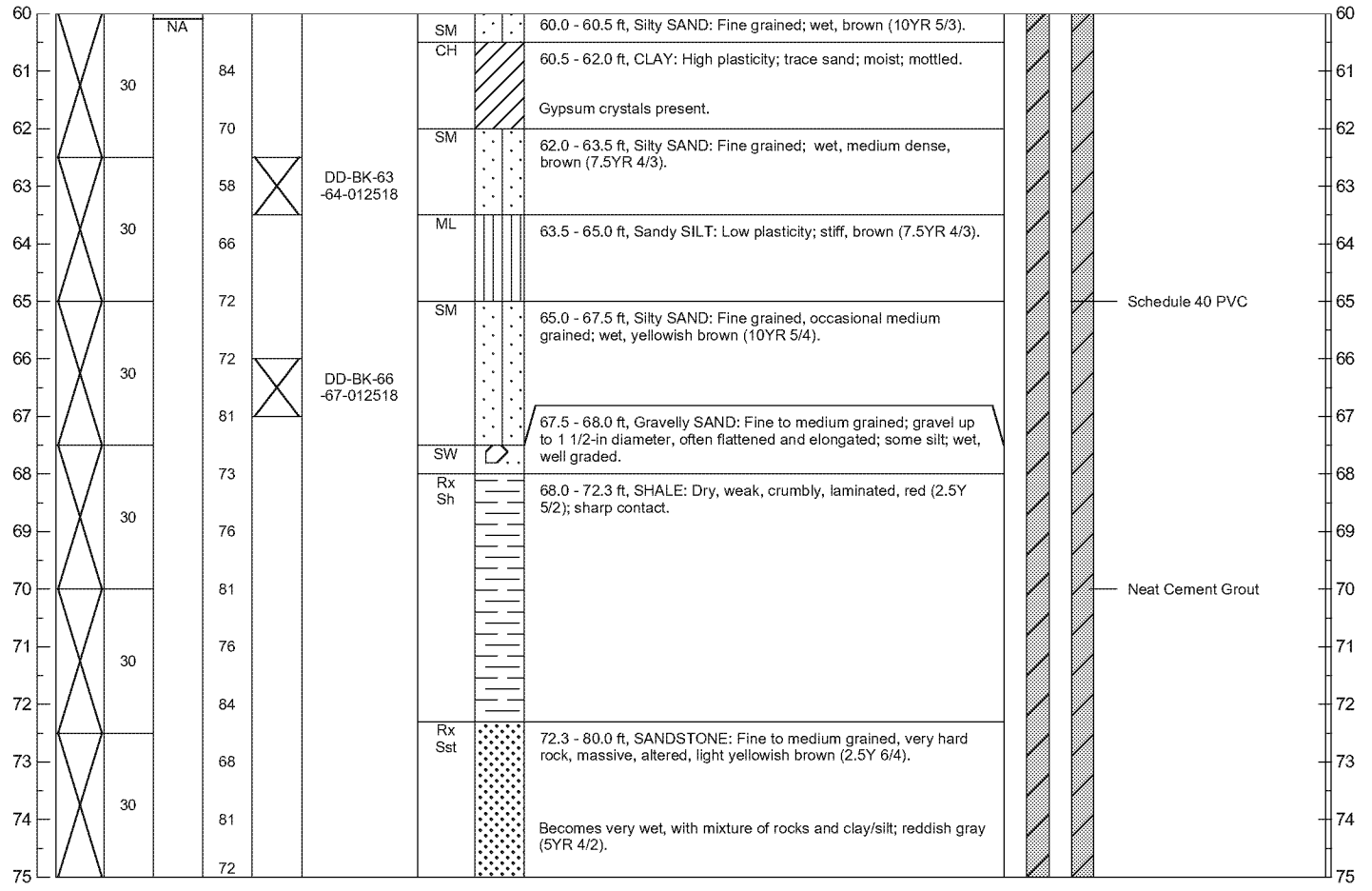
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376



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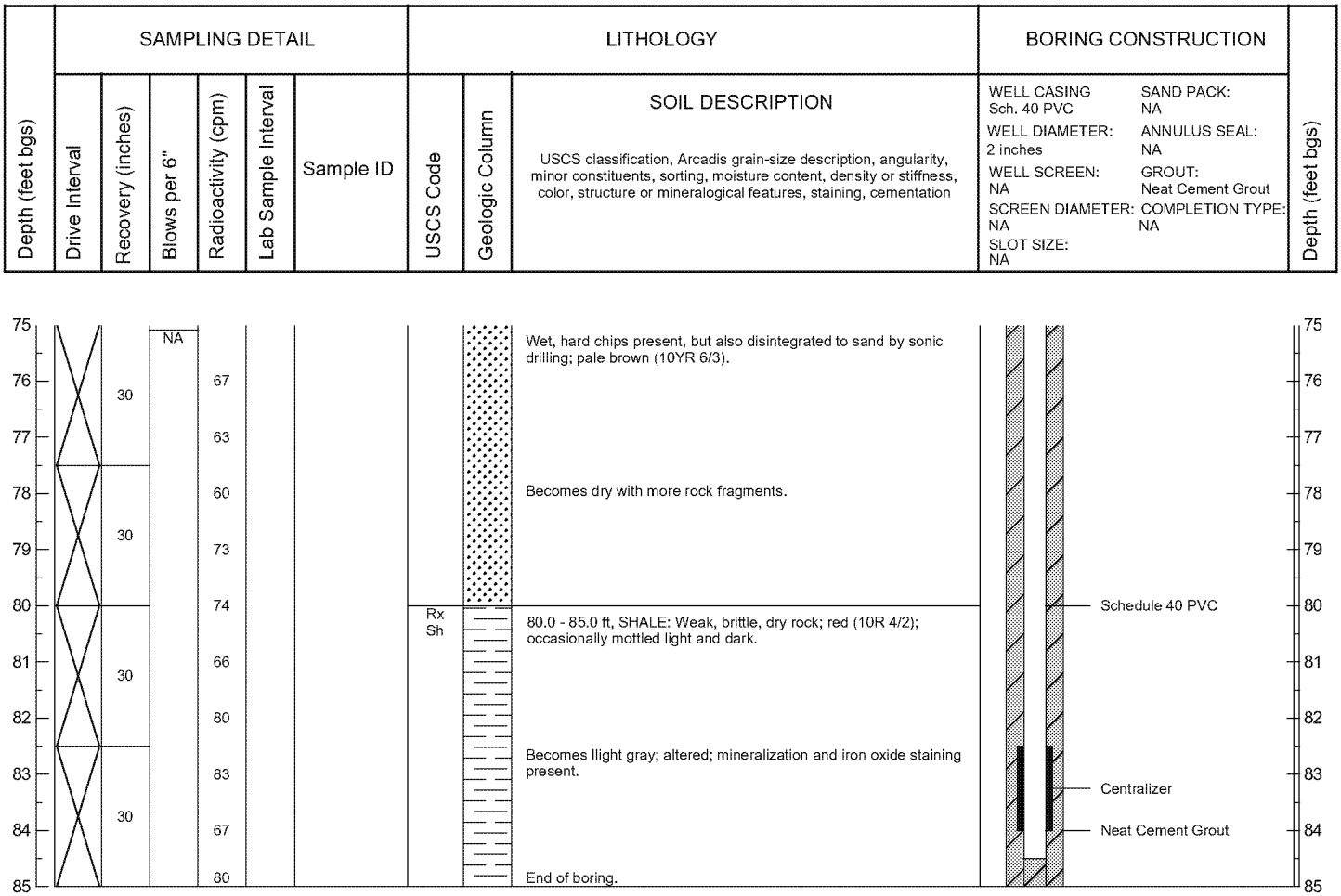
ARCADIS Boring and Well Construction Log

Date Drilling Started:	1/24/2018	**Northing:** 3904768.37	**Easting:** 238784.62	**DD-BK**	
Date Drilling Finished:	1/25/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/25/2018	**Total Borehole Depth:**	85.0 feet bgs		
Drilling Company:	Cascade Drilling, LLC	**Borehole Diameter:**	6 in./4 in.	**Client:**	Homestake Mining Company
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376



Abbreviations: bgs = below ground surface, NA = not available/not applicable, cpm = counts per minute, ft = feet, PVC = polyvinyl chloride, USCS = Unified Soil Classification System, in = inches, mm = millimeters, < = less than, % = percent

Notes:

Radioactivity measured using 2241 ratemeter with a 44-9 detector, sensitive to alpha-beta-gamma(a·ß·?) radiation Radioactivity background 74 counts per minute (cpm). Visqueen background 133 cpm at 5 feet bgs and 149 cpm at 17 feet bgs. 6-inch diameter borehole to 75 feet bgs. 4-inch diameter borehole from 75 feet bgs to total depth. Well abandoned on 1/26/2018 by cutting casing off at 3 feet bgs and filling remaining borehole with neat cement grout, approximately 20 gallons installed, at 1 bag of cement to 3 gallons of water ratio.

ARCADIS Boring and Well Construction Log

Date Drilling Started:	1/22/2018	**Northing:** 3904920.51	**Easting:** 238891.40	**DD2-BK**	
Date Drilling Finished:	1/24/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/24/2018	**Total Borehole Depth:**	100.0 feet bgs		
Drilling Company:	Cascade Drilling, LLC	**Borehole Diameter:**	6 in.	**Client:**	Homestake Mining Company
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376

Depth (feet bgs)	SAMPLING DETAIL: Drive Interval	Recovery (inches)	Blows per 6"	Radioactivity (c/min)	Lab Sample Interval	Sample ID	LITHOLOGY: USCS Code	Geologic Column	SOIL DESCRIPTION	WELL CONSTRUCTION	Depth (feet bgs)
0			NA				CL		0.0 - 5.0 ft, CLAY: Medium plasticity; trace sand, fine grained; moist, brown (10YR 4/3); mottling observed; trace rootlets.	WELL CASING: Sch. 40 PVC; SAND PACK: NA; WELL DIAMETER: 2 inches; ANNULUS SEAL: NA; WELL SCREEN: NA; GROUT: Neat Cement Grout; SCREEN DIAMETER: NA; COMPLETION TYPE: NA; SLOT SIZE: NA	0
1		6		75					Medium plasticity; some fine grained sand including silt; moist.		1
2		6		88							2
3		6		100							3
4		6		82						Schedule 40 PVC	4
5		6		94			SM		5.0 - 8.5 ft, Silty SAND: Fine grained; moist, loose, yellowish brown (10YR 5/4).		5
6		24		125						Centralizer	6
7				105							7
8				115							8
9		30		96			CH		8.5 - 12.0 ft, CLAY: High plasticity, fat clay; trace sand, fine grained; moist, brown (10YR 5/3).		9
10				104					Becomes stiff.	Neat Cement Grout	10
11		30		96		DD2-BK-11 -12-012218					11
12				98			SM		12.0 - 14.5 ft, Silty SAND: Fine grained; loose, moist, dark yellowish brown (10YR 4/4).		12
13		24		78					Becomes fine to medium grained sand, mostly fine grained; poorly graded.		13
14				93							14
15				70			SP		14.5 - 25.7 ft, SAND: Fine to coarse grained, mostly fine grained;		15

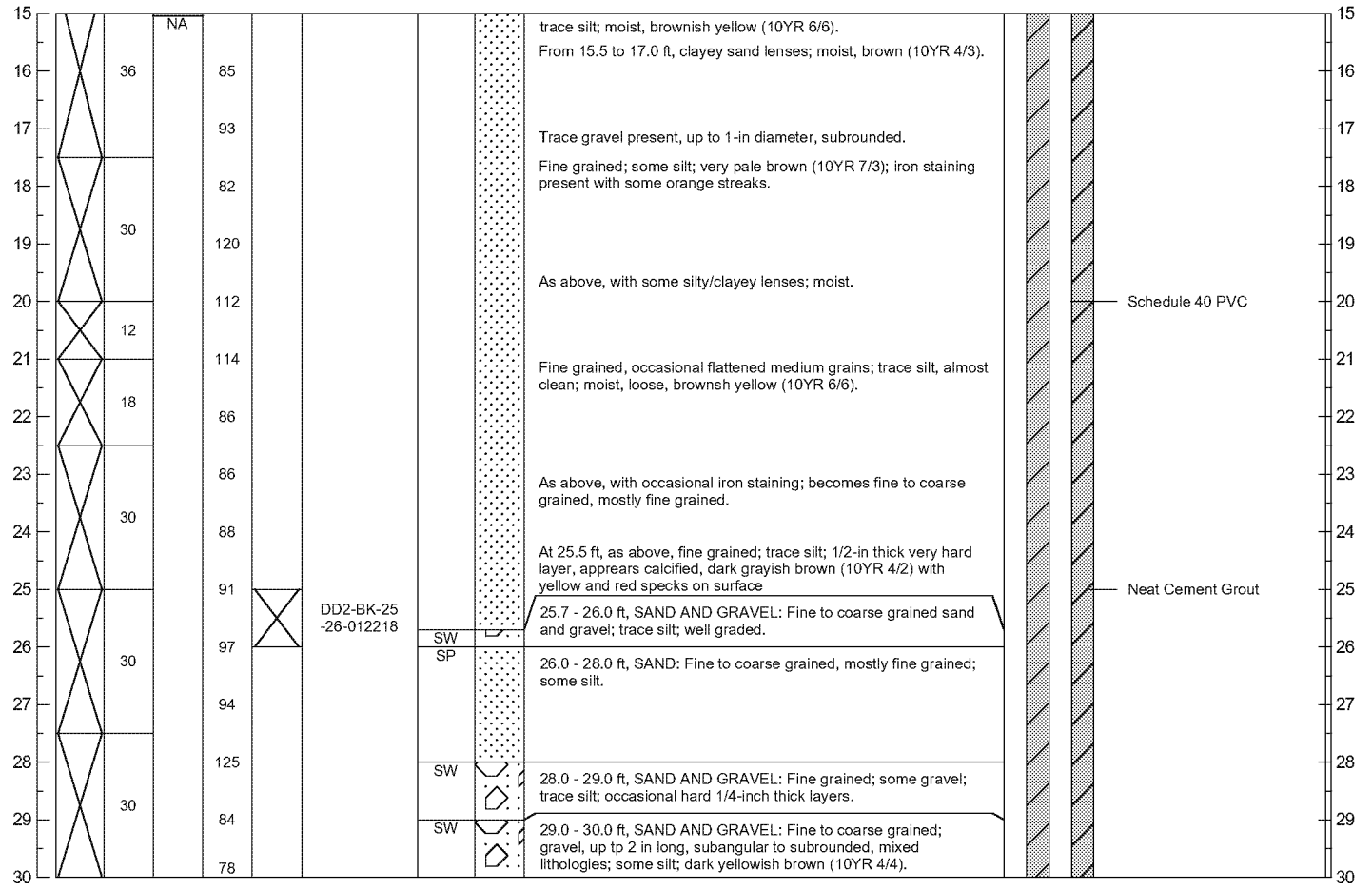
Abbreviations: bgs = below ground surface, NA = not available/not applicable, c/min = counts per minute, ft = feet, PVC = polyvinyl chloride, USCS = Unified Soil Classification System, in = inches, mm = millimeters, < = less than, % = percent

Notes:

Radioactivity measured using 2241 Rake Meter 44/9 detector. Radioactivity background 74 counts per minute (c/min) at alpha/beta/gamma (A/B/G). Visqueen background 133 c/min at 5 feet bgs and 149 c/min at 17 feet bgs. Well abandoned on 1/26/2018 by cutting casing off at 3 feet bgs and filling remaining borehole with neat cement grout, approximately 20 gallons installed, at 1 bag of cement to 3 gallons of water ratio.

ARCADIS Boring and Well Construction Log

Date Drilling Started:	1/22/2018	**Northing:** 3904920.51	**Easting:** 238891.40	**DD2-BK**	
Date Drilling Finished:	1/24/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/24/2018	**Total Borehole Depth:**	100.0 feet bgs		
Drilling Company:	Cascade Drilling, LLC	**Borehole Diameter:**	6 in.	**Client:**	Homestake Mining Company
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376



Abbreviations: bgs = below ground surface, NA = not available/not applicable, c/min = counts per minute, ft = feet, PVC = polyvinyl chloride, USCS = Unified Soil Classification System, in = inches, mm = millimeters, < = less than, % = percent

Notes:

Radioactivity measured using 2241 Rake Meter 44/9 detector. Radioactivity background 74 counts per minute (c/min) at alpha/beta/gamma (A/B/G). Visqueen background 133 c/min at 5 feet bgs and 149 c/min at 17 feet bgs. Well abandoned on 1/26/2018 by cutting casing off at 3 feet bgs and filling remaining borehole with neat cement grout, approximately 20 gallons installed, at 1 bag of cement to 3 gallons of water ratio.

ARCADIS Boring and Well Construction Log

Date Drilling Started:	1/22/2018	**Northing:** 3904920.51	**Easting:** 238891.40	**DD2-BK**	
Date Drilling Finished:	1/24/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/24/2018	**Total Borehole Depth:**	100.0 feet bgs		
Drilling Company:	Cascade Drilling, LLC	**Borehole Diameter:**	6 in.	**Client:**	Homestake Mining Company
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376

Depth (feet bgs)	SAMPLING DETAIL: Drive Interval	Recovery (inches)	Blows per 6"	Radioactivity (c/min)	Lab Sample Interval	Sample ID	LITHOLOGY: USCS Code	Geologic Column	SOIL DESCRIPTION	WELL CONSTRUCTION	Depth (feet bgs)
30			NA				SP		30.0 - 34.0 ft, SAND: Fine to coarse grained, mostly fine grained, subangular to subrounded; some silt; occasional clay layers and 1/4-in thick hard layers.	WELL CASING: Sch. 40 PVC; SAND PACK: NA; WELL DIAMETER: 2 inches; ANNULUS SEAL: NA; WELL SCREEN: NA; GROUT: Neat Cement Grout; SCREEN DIAMETER: NA; COMPLETION TYPE: NA; SLOT SIZE: NA	30
31		30		79							31
32				79							32
33				80							33
34		30		108			SC		34.0 - 35.0 ft, Clayey SAND: Fine to coarse grained; moist, dense, brown (10YR 4/3).		34
35				94			SM		35.0 - 36.5 ft, Silty SAND: Fine grained sand; moist, loose, light brownish yellow (10YR 6/4).	Schedule 40 PVC	35
36		30		104		DD2-BK-36 -37-012218	CH		36.5 - 39.0 ft, CLAY: High plasticity; moist, stiff, brown (10YR 5/3); mottled with darker and more orange colored areas (90% brown to more orange); iron oxide staining presnet.		36
37				90							37
38				97							38
39		30		94			SM		39.0 - 41.5 ft, Silty SAND: Fine to coarse grained, subangular to subrounded; brown (10YR 6/4); sand content 90% quartz, 10% lithic; from 39.0 to 40.0 ft, iron oxide present.		39
40				110						Neat Cement Grout	40
41		30		104							41
42				106			SC		41.5 - 44.0 ft, Clayey SAND: Fine grained; some clay; moist, stiff, brown (10YR 5/3). Becomes wet.	Depth to first water during drilling 42.5 feet bgs.	42
43				94							43
44		30		80			SP		44.0 - 49.0 ft, SAND: Fine grained; some silt; wet, medium dense; sand content 90% quartz, 10% lithic.		44
45				80							45

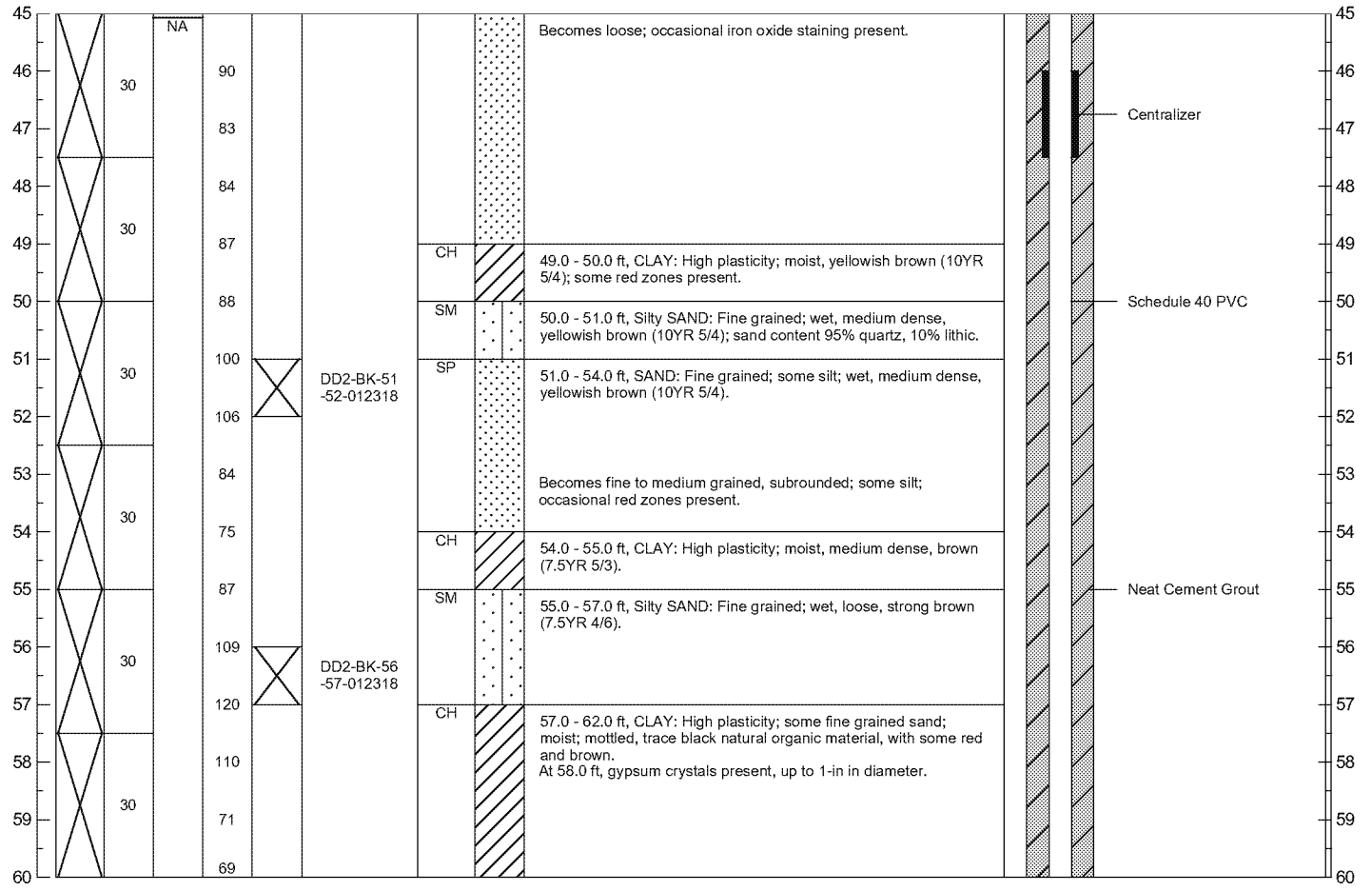
Abbreviations: bgs = below ground surface, NA = not available/not applicable, c/min = counts per minute, ft = feet, PVC = polyvinyl chloride, USCS = Unified Soil Classification System, in = inches, mm = millimeters, < = less than, % = percent

Notes:

Radioactivity measured using 2241 Rake Meter 44/9 detector. Radioactivity background 74 counts per minute (c/min) at alpha/beta/gamma (A/B/G). Visqueen background 133 c/min at 5 feet bgs and 149 c/min at 17 feet bgs. Well abandoned on 1/26/2018 by cutting casing off at 3 feet bgs and filling remaining borehole with neat cement grout, approximately 20 gallons installed, at 1 bag of cement to 3 gallons of water ratio.

ARCADIS Boring and Well Construction Log

Date Drilling Started:	1/22/2018	**Northing:** 3904920.51	**Easting:** 238891.40	**DD2-BK**	
Date Drilling Finished:	1/24/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/24/2018	**Total Borehole Depth:**	100.0 feet bgs		
Drilling Company:	Cascade Drilling, LLC	**Borehole Diameter:**	6 in.	**Client:**	Homestake Mining Company
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376



Abbreviations: bgs = below ground surface, NA = not available/not applicable, c/min = counts per minute, ft = feet, PVC = polyvinyl chloride, USCS = Unified Soil Classification System, in = inches, mm = millimeters, < = less than, % = percent

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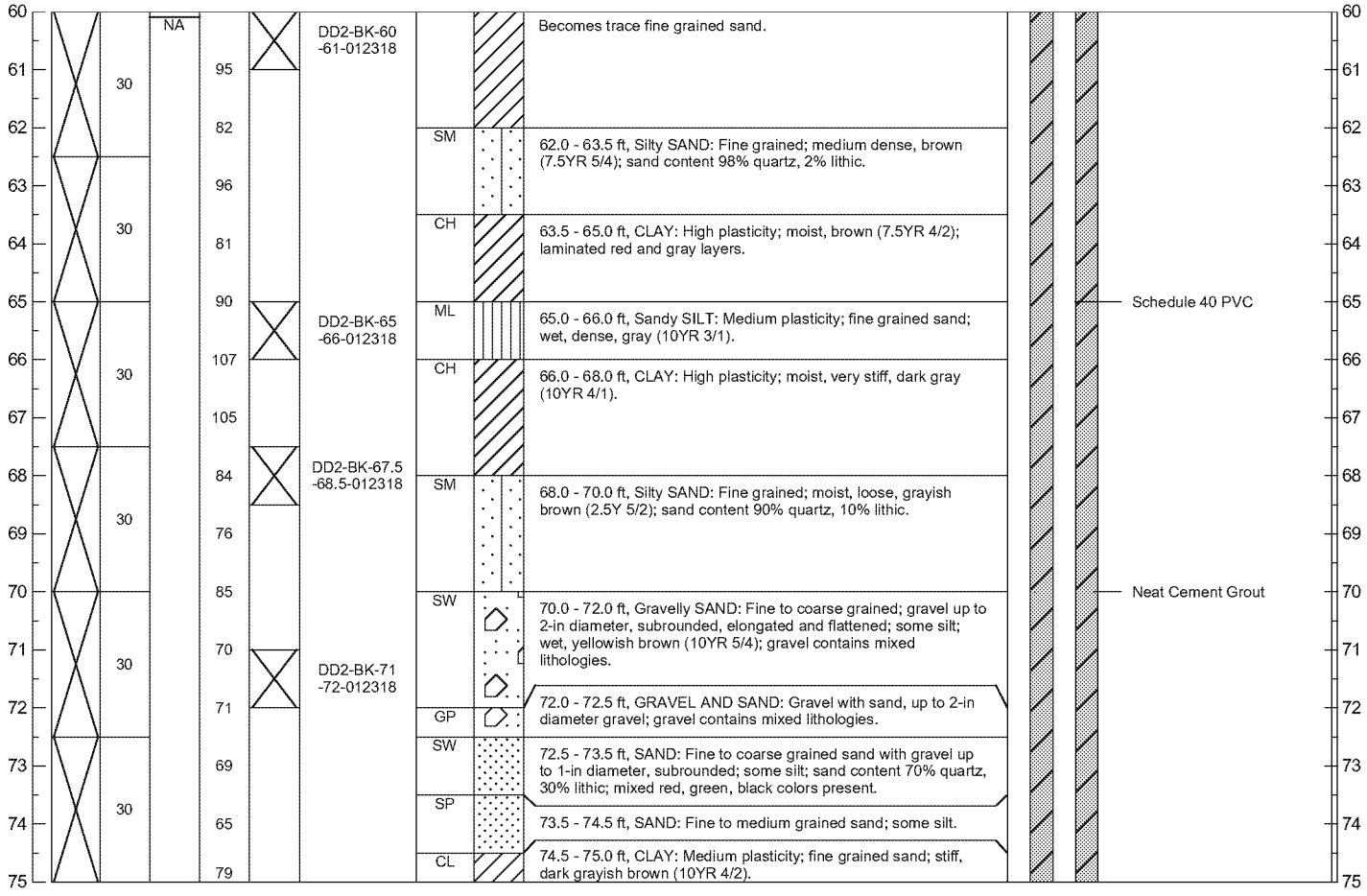
ARCADIS Boring and Well Construction Log

Date Drilling Started:	1/22/2018	**Northing:** 3904920.51	**Easting:** 238891.40	**DD2-BK**	
Date Drilling Finished:	1/24/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/24/2018	**Total Borehole Depth:**	100.0 feet bgs		
Drilling Company:	Cascade Drilling, LLC	**Borehole Diameter:**	6 in.	**Client:**	Homestake Mining Company
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376

Depth (feet bgs)	SAMPLING DETAIL: Drive Interval	Recovery (inches)	Blows per 6"	Radioactivity (c/min)	Lab Sample Interval	Sample ID	LITHOLOGY: USCS Code	Geologic Column	SOIL DESCRIPTION	WELL CONSTRUCTION	Depth (feet bgs)
									USCS classification, Arcadis grain-size description, angularity, minor constituents, sorting, moisture content, density or stiffness, color, structure or mineralogical features, staining, cementation	WELL CASING: Sch. 40 PVC; SAND PACK: NA; WELL DIAMETER: 2 inches; ANNULUS SEAL: NA; WELL SCREEN: NA; GROUT: Neat Cement Grout; SCREEN DIAMETER: NA; COMPLETION TYPE: NA; SLOT SIZE: NA	



Abbreviations: bgs = below ground surface, NA = not available/not applicable, c/min = counts per minute, ft = feet, PVC = polyvinyl chloride, USCS = Unified Soil Classification System, in = inches, mm = millimeters, < = less than, % = percent

Notes:

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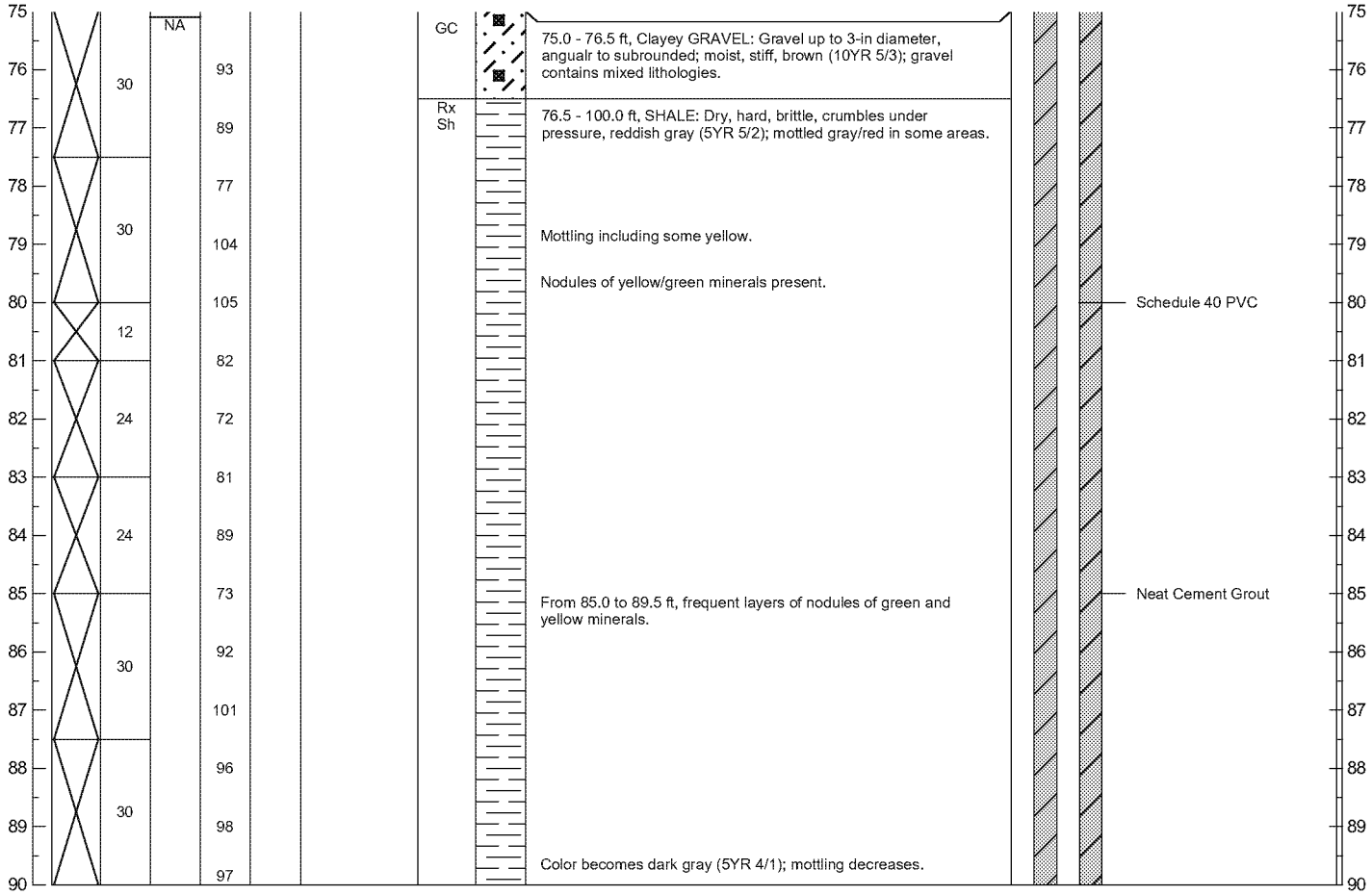
ARCADIS Boring and Well Construction Log

Date Drilling Started:	1/22/2018	**Northing:** 3904920.51	**Easting:** 238891.40	**DD2-BK**	
Date Drilling Finished:	1/24/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/24/2018	**Total Borehole Depth:**	100.0 feet bgs		
Drilling Company:	Cascade Drilling, LLC	**Borehole Diameter:**	6 in.	**Client:**	Homestake Mining Company
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376

Depth (feet bgs)	SAMPLING DETAIL: Drive Interval	Recovery (inches)	Blows per 6"	Radioactivity (c/min)	Lab Sample Interval	Sample ID	LITHOLOGY: USCS Code	Geologic Column	SOIL DESCRIPTION	WELL CONSTRUCTION	Depth (feet bgs)
									USCS classification, Arcadis grain-size description, angularity, minor constituents, sorting, moisture content, density or stiffness, color, structure or mineralogical features, staining, cementation	WELL CASING: Sch. 40 PVC; SAND PACK: NA; WELL DIAMETER: 2 inches; ANNULUS SEAL: NA; WELL SCREEN: NA; GROUT: Neat Cement Grout; SCREEN DIAMETER: NA; COMPLETION TYPE: NA; SLOT SIZE: NA	



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ARCADIS Boring and Well Construction Log

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Date Drilling Finished:	1/24/2018	**Surface Elevation:**	NA		
Date Well Complete:	1/24/2018	**Total Borehole Depth:**	100.0 feet bgs		
Drilling Company:	Cascade Drilling, LLC	**Borehole Diameter:**	6 in.	**Client:**	Homestake Mining Company
Drilling Rig:	Pro Sonic 600 Series	**Drilling Method:**	Sonic	**Location:**	Grants Reclamation
Driller's Name:		**Sampling Interval:**	Discrete		Grants, NM
Driller's Assistant(s):	NA	**Sampling Device:**	NA	**Project #:**	AO000120.1702
Logged By:	Shawn Roberts	**Drilling Fluid Used:**	None	**Reviewed By:**	Shawn Roberts #8376

Depth (feet bgs)	SAMPLING DETAIL: Drive Interval	Recovery (inches)	Blows per 6"	Radioactivity (c/min)	Lab Sample Interval	Sample ID	LITHOLOGY: USCS Code	Geologic Column	SOIL DESCRIPTION	WELL CONSTRUCTION	Depth (feet bgs)
90										WELL CASING: Sch. 40 PVC; SAND PACK: NA; WELL DIAMETER: 2 inches; ANNULUS SEAL: NA; WELL SCREEN: NA; GROUT: Neat Cement Grout; SCREEN DIAMETER: NA; COMPLETION TYPE: NA; SLOT SIZE: NA	90
91		12	NA	72					Color becomes gray (5YR 5/1).		91
92		24		71						Schedule 40 PVC	92
93				74					Color becomes reddish gray (2.5YR 6/1) with occasional light gray mottling.		93
94		24		88							94
95		12		85					Color becomes dark reddish gray (2.5YR 4/1).		95
96				77							96
97		24		89						Neat Cement Grout	97
98				94					Color becomes gray (10YR 6/1), with mottled gray and reddish areas; 90% gray.	Centralizer	98
99		24		92							99
100									End of boring log.		100

Abbreviations: bgs = below ground surface, NA = not available/not applicable, c/min = counts per minute, ft = feet, PVC = polyvinyl chloride, USCS = Unified Soil Classification System, in = inches, mm = millimeters, < = less than, % = percent

Notes: Radioactivity measured using 2241 Rake Meter 44/9 detector. Radioactivity background 74 counts per minute (c/min) at alpha/beta/gamma (A/B/G). Visqueen background 133 c/min at 5 feet bgs and 149 c/min at 17 feet bgs. Well abandoned on 1/26/2018 by cutting casing off at 3 feet bgs and filling remaining borehole with neat cement grout, approximately 20 gallons installed, at 1 bag of cement to 3 gallons of water ratio.

APPENDIX B

Geophysical Logs and Data

ARCADIS Design & Consultancy for natural and built assets

Geophysical Logging Services

Arcadis U.S., Inc.
150 Market Street, Suite 725
Indianapolis, Indiana 46204

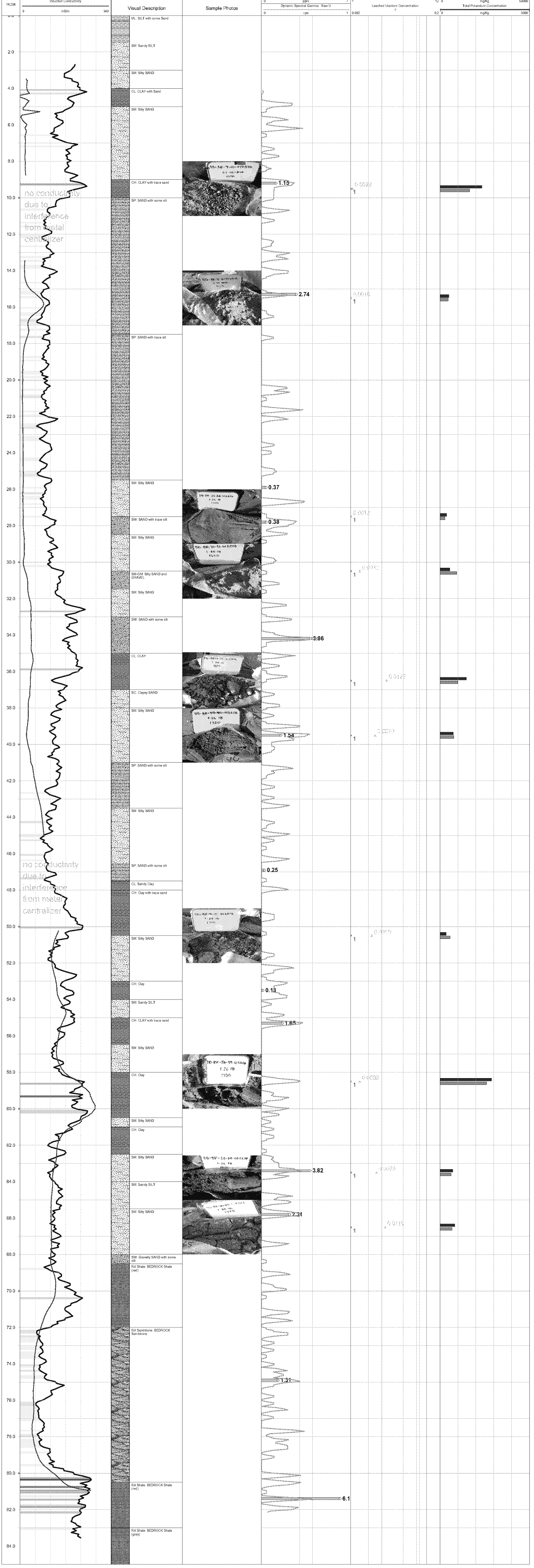
WELL NAME: BORING DD-BK
CLIENT: BARRICK GOLD CORP.
PROJECT LOCATION: GRANTS, NEW MEXICO

WELL COORDINATES:
PROJECTION:
SURFACE ELEVATION:
CASING STICK-UP:
DEPTH TO GROUNDWATER:
CASING DIAM.: 2 IN. **LENGTH:** 85 FEET
O.H. DIAM.: **FROM:** **TO:**

DATE LOGGED: 01/25/2018
LOGGED BY: Gabriel Hebert
CASING TYPE: PVC RISER
TOTAL DEPTH: 85 FEET
REMARKS:
STATIC SPECTRAL GAMMA LOGGED ON 1/25/2018

Logging Probes Used

- [x] Natural Gamma
- [ ] SPR/SP
- [x] Fluid Temperature/Resistivity
- [x] Induction Conductivity
- [ ] Normal Resistivity
- [ ] 3-Arm Caliper
- [ ] Accustic Televiewer
- [ ] Optical Televiewer
- [ ] Heat Pulse Flow Meter
- [ ] Spinner Flow Meter
- [x] Spectral Gamma
- [ ] Full Waveform Sonic
- [ ] Nuclear Magnetic Resonance
- [ ] Other: _____



ARCADIS
Design & Consultancy for natural and built assets

Geophysical Logging Services

Arcadis U.S., Inc.
150 Marker Street, Suite 726
Indianapolis, Indiana 46204

WELL NAME: BORING DD2-BK
CLIENT: BARRICK GOLD CORP.
PROJECT LOCATION: GRANTS, NEW MEXICO

WELL COORDINATES:
PROJECTION:
SURFACE ELEVATION:
CASING STICK-UP:
DEPTH TO GROUNDWATER:
CASING DIAM.: 2 IN. LENGTH: 100 FT
O.H. DIAM.: FROM: TO:

DATE LOGGED: 01/24/2018
LOGGED BY: Gabriel Hebert
CASING TYPE: PVC RISER
TOTAL DEPTH: 100 FEET
REMARKS:
STATIC SPECTRAL GAMMA LOGGED ON 1/25/2018

Logging Probes Used

- [x] Natural Gamma
- [ ] SPR/SP
- [ ] Fluid Temperature/Resistivity
- [x] Induction Conductivity
- [ ] Normal Resistivity
- [ ] 3-Arm Caliper
- [ ] Acoustic Televiewer
- [ ] Optical Televiewer
- [ ] Heat Pulse Flow Meter
- [ ] Spinner Flow Meter
- [x] Spectral Gamma
- [ ] Full Waveform Sonic
- [ ] Nuclear Magnetic Resonance
- [ ] Other: _____

Depth (ft:20ft)
Natural Gamma Ray: 0 cps 120
Induction Conductivity*: 0 mS/m 340
Visual Description
Sample Photos
Spectral Gamma Logging Results
Static Spectral Gamma: U - Weight Percent: 0 ppm 7
Dynamic Spectral Gamma: Raw U: 0 cps 1
Laboratory Analytical Results (ELI)
Total Uranium Concentration: 1 mg/Kg 12
Leached Uranium Concentration: 0.002 mg/L 0.2
Total Iron Concentration: 0 mg/Kg 50000
Total Potassium Concentration: 0 mg/Kg 5000

CL: CLAY with trace sand
SM: Silty SAND
CH: CLAY
SM: Silty SAND
SP: SAND with trace silt
SP: SAND with some silt
SP: SAND with trace silt
SW: SAND and GRAVEL
SP: SAND with some silt
SW: SAND and GRAVEL
SP: SAND with silt
SC: Clayey SAND
SM: Silty SAND
CH: CLAY
SM: Silty SAND
SP: SAND with silt
CH: CLAY
SM: Silty SAND
CH: CLAY with some sand
SM: Silty SAND
CH: CLAY
SM: Sandy SILT
CH: CLAY
SM: Silty SAND
SW: Gravely SAND with silt
GP: GRAVEL with sand
SW: SAND with gravel
SP: SAND with silt
CL: Sandy CLAY
GC: Clayey GRAVEL
RX Shale: BEDROCK Shale (red)
RX Shale: BEDROCK Shale (gray)

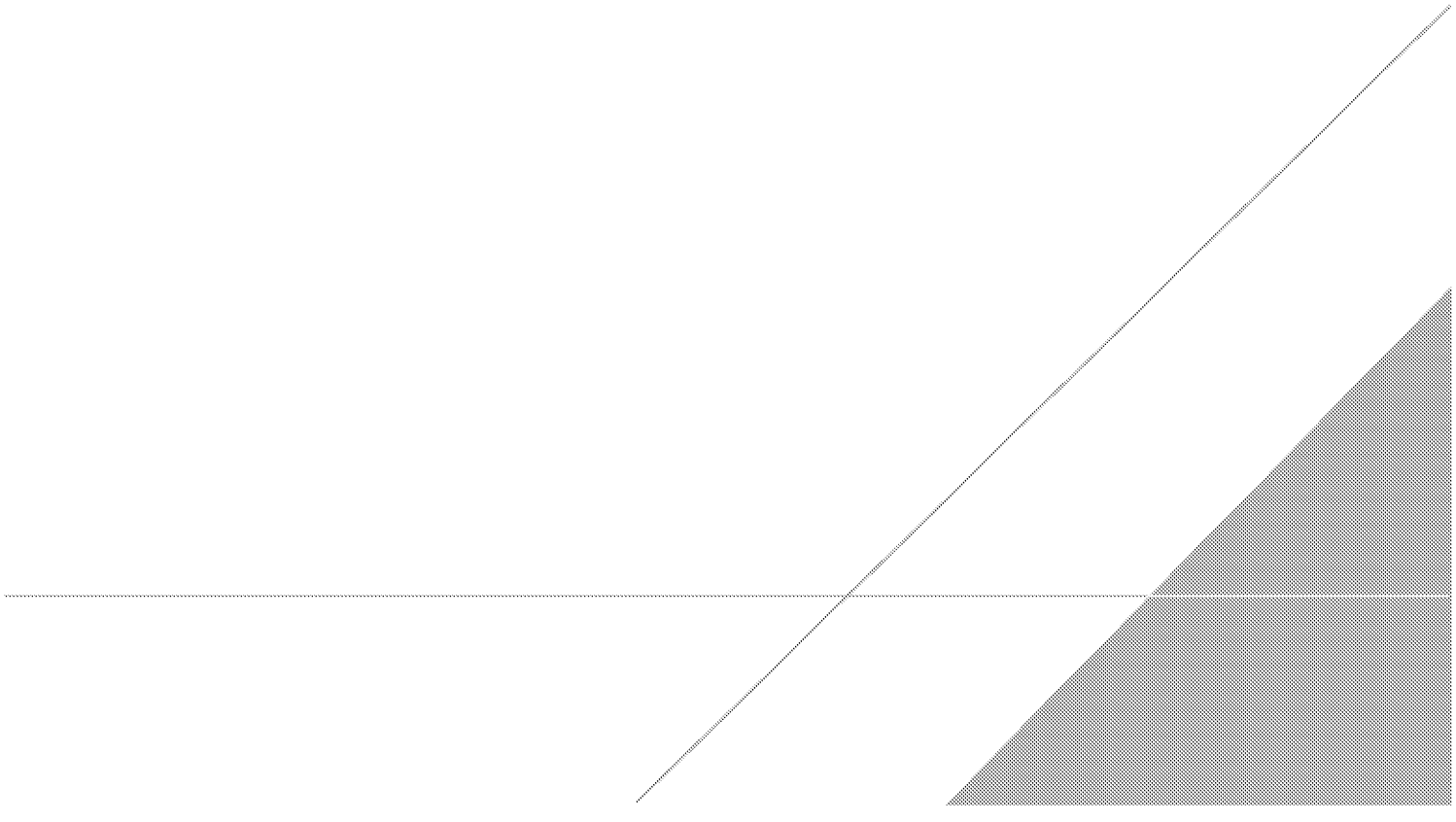
1.95
2.40
2.40
2.33
1.24
4.26
4.70
0.00
1.67
1.76
2.32
3.36
0.79
3.74
3.95
5.68

no conductivity due to interference from metal container

ED_004985_00011411-00265

APPENDIX C

Laboratory Data



ANALYTICAL SUMMARY REPORT

February 26, 2018

Homestake Mining Co
Hwy 605
Grants, NM 87020

Work Order: C18010791 Quote ID: C5105 - SPLP and Total Metals

Project Name: Grants Reclamation Project

Energy Laboratories, Inc. Casper WY received the following 18 samples for Homestake Mining Co on 1/30/2018 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C18010791-001	DD2-BK-36-37-012618	01/26/18 14:50	01/30/18	Soil	Metals by ICP/ICPMS, Total Metals by ICP/ICPMS, SPLP Moisture Percent Moisture Digestion, Total Metals SPLP Extraction, Regular Total Metals Digestion - SPLP
C18010791-002	DD2-BK-60-61-012618	01/26/18 15:05	01/30/18	Soil	Same As Above
C18010791-003	DD2-BK-67-68-012618	01/26/18 15:35	01/30/18	Soil	Same As Above
C18010791-004	DD-BK-9-10-012518	01/25/18 15:50	01/30/18	Soil	Same As Above
C18010791-005	DD-BK-30-31-012518	01/25/18 16:20	01/30/18	Soil	Same As Above
C18010791-006	DD-BK-36-37-012518	01/25/18 16:40	01/30/18	Soil	Same As Above
C18010791-007	DD-BK-66-67-012518	01/25/18 17:25	01/30/18	Soil	Same As Above
C18010791-008	DD-BK-27-28-012618	01/26/18 13:00	01/30/18	Soil	Same As Above
C18010791-009	DD-BK-39-40-012618	01/26/18 13:20	01/30/18	Soil	Same As Above
C18010791-010	DD-BK-58-59-012618	01/26/18 13:30	01/30/18	Soil	Same As Above
C18010791-011	DD-BK-63-64-012618	01/26/18 14:00	01/30/18	Soil	Same As Above
C18010791-012	DUP	01/25/18 00:00	01/30/18	Soil	Same As Above
C18010791-013	DD2-BK-11-12-012218	01/22/18 15:09	01/30/18	Soil	Same As Above
C18010791-014	DD2-BK-25-26-012218	01/22/18 15:20	01/30/18	Soil	Same As Above
C18010791-015	DD2-BK-51-52-012318	01/23/18 12:50	01/30/18	Soil	Same As Above
C18010791-016	DD2-BK-56-57-012318	01/23/18 13:15	01/30/18	Soil	Same As Above
C18010791-017	DD2-BK-71-72-012318	01/23/18 13:30	01/30/18	Soil	Same As Above
C18010791-018	DD2-BK-65-66-012318	01/23/18 14:20	01/30/18	Soil	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

ED_004985_00011411-00267

CLIENT: Homestake Mining Co
Project: Grants Reclamation Project
Work Order: C18010791

Report Date: 02/26/18

CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

NOTE:
The SPLP extraction was modified per the Client's request. Sodium bicarbonate/carbonate (CARB) was used as an extractant and was prepared as reqeusted. The extractant was 0.0144 M in NaHCO3 and 0.0028 M in Na2CO3.

ED_004985_00011411-00268

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-001
Client Sample ID: DD2-BK-36-37-012618

Report Date: 02/26/18
Collection Date: 01/26/18 14:50
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	8.1	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	2700	mg/kg-dry	D	10		SW6010B	02/06/18 16:04 / eli-b
Calcium	9140	mg/kg-dry	D	30		SW6010B	02/06/18 16:04 / eli-b
Iron	4810	mg/kg-dry	D	10		SW6010B	02/06/18 16:04 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:19 / eli-b
Phosphorus	212	mg/kg-dry	D	20		SW6010B	02/06/18 16:04 / eli-b
Potassium	503	mg/kg-dry	D	50		SW6010B	02/06/18 16:04 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:19 / eli-b
Sodium	107	mg/kg-dry	D	30		SW6010B	02/06/18 16:04 / eli-b
Uranium	<1	mg/kg-dry		1		SW6020	02/06/18 18:19 / eli-b
Vanadium	8	mg/kg-dry		1		SW6020	02/06/18 18:19 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.009	mg/L		0.001		SW6020	02/13/18 16:12 / eli-b
Selenium	0.003	mg/L		0.001		SW6020	02/15/18 14:49 / eli-b
Uranium	0.0090	mg/L		0.0003		SW6020	02/13/18 16:12 / eli-b
Vanadium	0.06	mg/L		0.01		SW6010B	02/13/18 17:29 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-002
Client Sample ID: DD2-BK-60-61-012618

Report Date: 02/26/18
Collection Date: 01/26/18 15:05
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	23.6	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	21600	mg/kg-dry	D	10		SW6010B	02/06/18 16:08 / eli-b
Calcium	21500	mg/kg-dry	D	40		SW6010B	02/06/18 16:08 / eli-b
Iron	19100	mg/kg-dry	D	10		SW6010B	02/06/18 16:08 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:22 / eli-b
Phosphorus	512	mg/kg-dry	D	30		SW6010B	02/06/18 16:08 / eli-b
Potassium	2920	mg/kg-dry	D	60		SW6010B	02/06/18 16:08 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:22 / eli-b
Sodium	625	mg/kg-dry	D	40		SW6010B	02/06/18 16:08 / eli-b
Uranium	2	mg/kg-dry		1		SW6020	02/06/18 18:22 / eli-b
Vanadium	32	mg/kg-dry		1		SW6020	02/06/18 18:22 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.005	mg/L		0.001		SW6020	02/13/18 16:17 / eli-b
Selenium	0.002	mg/L		0.001		SW6020	02/15/18 14:55 / eli-b
Uranium	0.0086	mg/L		0.0003		SW6020	02/13/18 16:17 / eli-b
Vanadium	<0.01	mg/L		0.01		SW6010B	02/13/18 17:40 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ED_004985_00011411-00270

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-003
Client Sample ID: DD2-BK-67-68-012618

Report Date: 02/26/18
Collection Date: 01/26/18 15:35
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	14.9	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	4530	mg/kg-dry	D	10		SW6010B	02/06/18 16:12 / eli-b
Calcium	14600	mg/kg-dry	D	30		SW6010B	02/06/18 16:12 / eli-b
Iron	7940	mg/kg-dry	D	10		SW6010B	02/06/18 16:12 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:24 / eli-b
Phosphorus	216	mg/kg-dry	D	20		SW6010B	02/06/18 16:12 / eli-b
Potassium	889	mg/kg-dry	D	60		SW6010B	02/06/18 16:12 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:24 / eli-b
Sodium	172	mg/kg-dry	D	30		SW6010B	02/06/18 16:12 / eli-b
Uranium	1	mg/kg-dry		1		SW6020	02/06/18 18:24 / eli-b
Vanadium	11	mg/kg-dry		1		SW6020	02/06/18 18:24 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.007	mg/L		0.001		SW6020	02/13/18 16:20 / eli-b
Selenium	0.002	mg/L		0.001		SW6020	02/15/18 14:57 / eli-b
Uranium	0.0180	mg/L		0.0003		SW6020	02/13/18 16:20 / eli-b
Vanadium	0.12	mg/L		0.01		SW6010B	02/13/18 17:48 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ED_004985_00011411-00271

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-004
Client Sample ID: DD-BK-9-10-012518

Report Date: 02/26/18
Collection Date: 01/25/18 15:50
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	10.1	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	14500	mg/kg-dry	D	10		SW6010B	02/06/18 16:16 / eli-b
Calcium	19800	mg/kg-dry	D	30		SW6010B	02/06/18 16:16 / eli-b
Iron	16600	mg/kg-dry	D	10		SW6010B	02/06/18 16:16 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:35 / eli-b
Phosphorus	385	mg/kg-dry	D	20		SW6010B	02/06/18 16:16 / eli-b
Potassium	2340	mg/kg-dry	D	50		SW6010B	02/06/18 16:16 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:35 / eli-b
Sodium	409	mg/kg-dry	D	30		SW6010B	02/06/18 16:16 / eli-b
Uranium	1	mg/kg-dry		1		SW6020	02/06/18 18:35 / eli-b
Vanadium	26	mg/kg-dry		1		SW6020	02/06/18 18:35 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.002	mg/L		0.001		SW6020	02/14/18 15:01 / eli-b
Selenium	0.002	mg/L		0.001		SW6020	02/15/18 15:08 / eli-b
Uranium	0.0022	mg/L		0.0003		SW6020	02/14/18 15:01 / eli-b
Vanadium	<0.01	mg/L		0.01		SW6010B	02/13/18 18:04 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-005
Client Sample ID: DD-BK-30-31-012518

Report Date: 02/26/18
Collection Date: 01/25/18 16:20
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	1.4	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	2750	mg/kg-dry	D	10		SW6010B	02/06/18 16:21 / eli-b
Calcium	10400	mg/kg-dry	D	30		SW6010B	02/06/18 16:21 / eli-b
Iron	9340	mg/kg-dry	D	10		SW6010B	02/06/18 16:21 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:38 / eli-b
Phosphorus	279	mg/kg-dry	D	20		SW6010B	02/06/18 16:21 / eli-b
Potassium	547	mg/kg-dry	D	50		SW6010B	02/06/18 16:21 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:38 / eli-b
Sodium	76	mg/kg-dry	D	30		SW6010B	02/06/18 16:21 / eli-b
Uranium	<1	mg/kg-dry		1		SW6020	02/06/18 18:38 / eli-b
Vanadium	12	mg/kg-dry		1		SW6020	02/06/18 18:38 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.005	mg/L		0.001		SW6020	02/13/18 16:25 / eli-b
Selenium	0.002	mg/L		0.001		SW6020	02/15/18 15:10 / eli-b
Uranium	0.0032	mg/L		0.0003		SW6020	02/13/18 16:25 / eli-b
Vanadium	0.07	mg/L		0.01		SW6020	02/13/18 16:25 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-006
Client Sample ID: DD-BK-36-37-012518

Report Date: 02/26/18
Collection Date: 01/25/18 16:40
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	6.0	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	8920	mg/kg-dry	D	10		SW6010B	02/06/18 16:34 / eli-b
Calcium	20900	mg/kg-dry	D	30		SW6010B	02/06/18 16:34 / eli-b
Iron	9930	mg/kg-dry	D	10		SW6010B	02/06/18 16:34 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:40 / eli-b
Phosphorus	237	mg/kg-dry	D	20		SW6010B	02/06/18 16:34 / eli-b
Potassium	1470	mg/kg-dry	D	50		SW6010B	02/06/18 16:34 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:40 / eli-b
Sodium	143	mg/kg-dry	D	30		SW6010B	02/06/18 16:34 / eli-b
Uranium	1	mg/kg-dry		1		SW6020	02/06/18 18:40 / eli-b
Vanadium	15	mg/kg-dry		1		SW6020	02/06/18 18:40 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.005	mg/L		0.001		SW6020	02/13/18 16:36 / eli-b
Selenium	0.005	mg/L		0.001		SW6020	02/15/18 15:13 / eli-b
Uranium	0.0127	mg/L		0.0003		SW6020	02/13/18 16:36 / eli-b
Vanadium	0.10	mg/L		0.01		SW6010B	02/13/18 18:20 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-007
Client Sample ID: DD-BK-66-67-012518

Report Date: 02/26/18
Collection Date: 01/25/18 17:25
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	14.4	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	6870	mg/kg-dry	D	10		SW6010B	02/06/18 16:39 / eli-b
Calcium	16100	mg/kg-dry	D	30		SW6010B	02/06/18 16:39 / eli-b
Iron	6670	mg/kg-dry	D	10		SW6010B	02/06/18 16:39 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:43 / eli-b
Phosphorus	212	mg/kg-dry	D	20		SW6010B	02/06/18 16:39 / eli-b
Potassium	831	mg/kg-dry	D	50		SW6010B	02/06/18 16:39 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:43 / eli-b
Sodium	221	mg/kg-dry	D	30		SW6010B	02/06/18 16:39 / eli-b
Uranium	<1	mg/kg-dry		1		SW6020	02/06/18 18:43 / eli-b
Vanadium	13	mg/kg-dry		1		SW6020	02/06/18 18:43 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.006	mg/L		0.001		SW6020	02/13/18 16:39 / eli-b
Selenium	0.003	mg/L		0.001		SW6020	02/15/18 15:16 / eli-b
Uranium	0.0118	mg/L		0.0003		SW6020	02/13/18 16:39 / eli-b
Vanadium	0.10	mg/L		0.01		SW6010B	02/13/18 18:28 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ED_004985_00011411-00275

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-008
Client Sample ID: DD-BK-27-28-012618

Report Date: 02/26/18
Collection Date: 01/26/18 13:00
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	0.8	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	1550	mg/kg-dry	D	9		SW6010B	02/06/18 16:43 / eli-b
Calcium	566	mg/kg-dry	D	30		SW6010B	02/06/18 16:43 / eli-b
Iron	2740	mg/kg-dry	D	9		SW6010B	02/06/18 16:43 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:46 / eli-b
Phosphorus	54	mg/kg-dry	D	20		SW6010B	02/06/18 16:43 / eli-b
Potassium	366	mg/kg-dry	D	40		SW6010B	02/06/18 16:43 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:46 / eli-b
Sodium	62	mg/kg-dry	D	30		SW6010B	02/06/18 16:43 / eli-b
Uranium	<1	mg/kg-dry		1		SW6020	02/06/18 18:46 / eli-b
Vanadium	5	mg/kg-dry		1		SW6020	02/06/18 18:46 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.004	mg/L		0.001		SW6020	02/13/18 16:41 / eli-b
Selenium	<0.001	mg/L		0.001		SW6020	02/15/18 15:18 / eli-b
Uranium	0.0012	mg/L		0.0003		SW6020	02/13/18 16:41 / eli-b
Vanadium	0.03	mg/L		0.01		SW6010B	02/13/18 18:35 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ED_004985_00011411-00276

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-009
Client Sample ID: DD-BK-39-40-012618

Report Date: 02/26/18
Collection Date: 01/26/18 13:20
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	3.9	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	2960	mg/kg-dry	D	10		SW6010B	02/06/18 16:47 / eli-b
Calcium	6110	mg/kg-dry	D	30		SW6010B	02/06/18 16:47 / eli-b
Iron	7700	mg/kg-dry	D	10		SW6010B	02/06/18 16:47 / eli-b
Molybdenum	1	mg/kg-dry		1		SW6020	02/06/18 18:48 / eli-b
Phosphorus	109	mg/kg-dry	D	20		SW6010B	02/06/18 16:47 / eli-b
Potassium	744	mg/kg-dry	D	50		SW6010B	02/06/18 16:47 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:48 / eli-b
Sodium	199	mg/kg-dry	D	30		SW6010B	02/06/18 16:47 / eli-b
Uranium	<1	mg/kg-dry		1		SW6020	02/06/18 18:48 / eli-b
Vanadium	9	mg/kg-dry		1		SW6020	02/06/18 18:48 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.014	mg/L		0.001		SW6020	02/13/18 16:44 / eli-b
Selenium	0.002	mg/L		0.001		SW6020	02/15/18 15:21 / eli-b
Uranium	0.0070	mg/L		0.0003		SW6020	02/13/18 16:44 / eli-b
Vanadium	0.13	mg/L		0.01		SW6010B	02/13/18 18:51 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-010
Client Sample ID: DD-BK-58-59-012618

Report Date: 02/26/18
Collection Date: 01/26/18 13:30
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	19.5	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	20000	mg/kg-dry	D	10		SW6010B	02/06/18 16:51 / eli-b
Calcium	11200	mg/kg-dry	D	40		SW6010B	02/06/18 16:51 / eli-b
Iron	26100	mg/kg-dry	D	10		SW6010B	02/06/18 16:51 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:51 / eli-b
Phosphorus	432	mg/kg-dry	D	20		SW6010B	02/06/18 16:51 / eli-b
Potassium	2890	mg/kg-dry	D	60		SW6010B	02/06/18 16:51 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:51 / eli-b
Sodium	664	mg/kg-dry	D	40		SW6010B	02/06/18 16:51 / eli-b
Uranium	1	mg/kg-dry		1		SW6020	02/06/18 18:51 / eli-b
Vanadium	34	mg/kg-dry		1		SW6020	02/06/18 18:51 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.003	mg/L		0.001		SW6020	02/13/18 16:47 / eli-b
Selenium	0.002	mg/L		0.001		SW6020	02/15/18 15:24 / eli-b
Uranium	0.0032	mg/L		0.0003		SW6020	02/13/18 16:47 / eli-b
Vanadium	0.03	mg/L		0.01		SW6010B	02/13/18 18:59 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-011
Client Sample ID: DD-BK-63-64-012618

Report Date: 02/26/18
Collection Date: 01/26/18 14:00
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	13.1	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	4590	mg/kg-dry	D	10		SW6010B	02/06/18 16:55 / eli-b
Calcium	9120	mg/kg-dry	D	30		SW6010B	02/06/18 16:55 / eli-b
Iron	6140	mg/kg-dry	D	10		SW6010B	02/06/18 16:55 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:54 / eli-b
Phosphorus	158	mg/kg-dry	D	20		SW6010B	02/06/18 16:55 / eli-b
Potassium	714	mg/kg-dry	D	60		SW6010B	02/06/18 16:55 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:54 / eli-b
Sodium	205	mg/kg-dry	D	30		SW6010B	02/06/18 16:55 / eli-b
Uranium	<1	mg/kg-dry		1		SW6020	02/06/18 18:54 / eli-b
Vanadium	11	mg/kg-dry		1		SW6020	02/06/18 18:54 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.004	mg/L		0.001		SW6020	02/13/18 16:49 / eli-b
Selenium	0.002	mg/L		0.001		SW6020	02/15/18 15:26 / eli-b
Uranium	0.0075	mg/L		0.0003		SW6020	02/13/18 16:49 / eli-b
Vanadium	0.13	mg/L		0.01		SW6010B	02/13/18 19:07 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-012
Client Sample ID: DUP

Report Date: 02/26/18
Collection Date: 01/25/18
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	19.9	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	7920	mg/kg-dry	D	10		SW6010B	02/06/18 16:59 / eli-b
Calcium	3800	mg/kg-dry	D	40		SW6010B	02/06/18 16:59 / eli-b
Iron	11300	mg/kg-dry	D	10		SW6010B	02/06/18 16:59 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:56 / eli-b
Phosphorus	320	mg/kg-dry	D	20		SW6010B	02/06/18 16:59 / eli-b
Potassium	1330	mg/kg-dry	D	60		SW6010B	02/06/18 16:59 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:56 / eli-b
Sodium	286	mg/kg-dry	D	40		SW6010B	02/06/18 16:59 / eli-b
Uranium	3	mg/kg-dry		1		SW6020	02/06/18 18:56 / eli-b
Vanadium	15	mg/kg-dry		1		SW6020	02/06/18 18:56 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.002	mg/L		0.001		SW6020	02/13/18 16:52 / eli-b
Selenium	0.002	mg/L		0.001		SW6020	02/15/18 15:29 / eli-b
Uranium	0.0132	mg/L		0.0003		SW6020	02/13/18 16:52 / eli-b
Vanadium	0.04	mg/L		0.01		SW6010B	02/13/18 19:15 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-013
Client Sample ID: DD2-BK-11-12-012218

Report Date: 02/26/18
Collection Date: 01/22/18 15:09
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	21.2	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	25300	mg/kg-dry	D	10		SW6010B	02/06/18 17:03 / eli-b
Calcium	20300	mg/kg-dry	D	40		SW6010B	02/06/18 17:03 / eli-b
Iron	22200	mg/kg-dry	D	10		SW6010B	02/06/18 17:03 / eli-b
Molybdenum	3	mg/kg-dry		1		SW6020	02/06/18 18:59 / eli-b
Phosphorus	528	mg/kg-dry	D	30		SW6010B	02/06/18 17:03 / eli-b
Potassium	4260	mg/kg-dry	D	60		SW6010B	02/06/18 17:03 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:59 / eli-b
Sodium	727	mg/kg-dry	D	40		SW6010B	02/06/18 17:03 / eli-b
Uranium	10	mg/kg-dry		1		SW6020	02/06/18 18:59 / eli-b
Vanadium	34	mg/kg-dry		1		SW6020	02/06/18 18:59 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.042	mg/L		0.001		SW6020	02/13/18 16:54 / eli-b
Selenium	0.001	mg/L		0.001		SW6020	02/15/18 15:32 / eli-b
Uranium	0.179	mg/L		0.0003		SW6020	02/13/18 16:54 / eli-b
Vanadium	0.02	mg/L		0.01		SW6010B	02/13/18 19:22 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-014
Client Sample ID: DD2-BK-25-26-012218

Report Date: 02/26/18
Collection Date: 01/22/18 15:20
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	3.1	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	1730	mg/kg-dry	D	10		SW6010B	02/06/18 17:07 / eli-b
Calcium	12800	mg/kg-dry	D	30		SW6010B	02/06/18 17:07 / eli-b
Iron	4550	mg/kg-dry	D	10		SW6010B	02/06/18 17:07 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 19:10 / eli-b
Phosphorus	174	mg/kg-dry	D	20		SW6010B	02/06/18 17:07 / eli-b
Potassium	290	mg/kg-dry	D	50		SW6010B	02/06/18 17:07 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 19:10 / eli-b
Sodium	77	mg/kg-dry	D	30		SW6010B	02/06/18 17:07 / eli-b
Uranium	1	mg/kg-dry		1		SW6020	02/06/18 19:10 / eli-b
Vanadium	7	mg/kg-dry		1		SW6020	02/06/18 19:10 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.033	mg/L		0.001		SW6020	02/13/18 16:57 / eli-b
Selenium	<0.001	mg/L		0.001		SW6020	02/15/18 15:42 / eli-b
Uranium	0.0477	mg/L		0.0003		SW6020	02/13/18 16:57 / eli-b
Vanadium	0.03	mg/L		0.01		SW6010B	02/13/18 20:05 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-015
Client Sample ID: DD2-BK-51-52-012318

Report Date: 02/26/18
Collection Date: 01/23/18 12:50
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	18.1	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	7940	mg/kg-dry	D	10		SW6010B	02/06/18 17:35 / eli-b
Calcium	4360	mg/kg-dry	D	40		SW6010B	02/06/18 17:35 / eli-b
Iron	11000	mg/kg-dry	D	10		SW6010B	02/06/18 17:35 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 19:31 / eli-b
Phosphorus	336	mg/kg-dry	D	20		SW6010B	02/06/18 17:35 / eli-b
Potassium	1370	mg/kg-dry	D	60		SW6010B	02/06/18 17:35 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 19:31 / eli-b
Sodium	292	mg/kg-dry	D	40		SW6010B	02/06/18 17:35 / eli-b
Uranium	2	mg/kg-dry		1		SW6020	02/06/18 19:31 / eli-b
Vanadium	15	mg/kg-dry		1		SW6020	02/06/18 19:31 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.002	mg/L		0.001		SW6020	02/13/18 17:00 / eli-b
Selenium	0.001	mg/L		0.001		SW6020	02/15/18 15:45 / eli-b
Uranium	0.0086	mg/L		0.0003		SW6020	02/13/18 17:00 / eli-b
Vanadium	<0.01	mg/L		0.01		SW6010B	02/13/18 20:17 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ED_004985_00011411-00283

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-016
Client Sample ID: DD2-BK-56-57-012318

Report Date: 02/26/18
Collection Date: 01/23/18 13:15
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	21.0	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	23600	mg/kg-dry	D	10		SW6010B	02/06/18 17:39 / eli-b
Calcium	20800	mg/kg-dry	D	40		SW6010B	02/06/18 17:39 / eli-b
Iron	20900	mg/kg-dry	D	10		SW6010B	02/06/18 17:39 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 19:33 / eli-b
Phosphorus	498	mg/kg-dry	D	20		SW6010B	02/06/18 17:39 / eli-b
Potassium	3360	mg/kg-dry	D	60		SW6010B	02/06/18 17:39 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 19:33 / eli-b
Sodium	695	mg/kg-dry	D	40		SW6010B	02/06/18 17:39 / eli-b
Uranium	1	mg/kg-dry		1		SW6020	02/06/18 19:33 / eli-b
Vanadium	29	mg/kg-dry		1		SW6020	02/06/18 19:33 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.005	mg/L		0.001		SW6020	02/13/18 17:10 / eli-b
Selenium	0.002	mg/L		0.001		SW6020	02/15/18 15:47 / eli-b
Uranium	0.0079	mg/L		0.0003		SW6020	02/13/18 17:10 / eli-b
Vanadium	0.05	mg/L		0.01		SW6010B	02/13/18 20:25 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ED_004985_00011411-00284

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-017
Client Sample ID: DD2-BK-71-72-012318

Report Date: 02/26/18
Collection Date: 01/23/18 13:30
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	11.5	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	2290	mg/kg-dry	D	10		SW6010B	02/06/18 17:43 / eli-b
Calcium	42500	mg/kg-dry	D	30		SW6010B	02/06/18 17:43 / eli-b
Iron	42700	mg/kg-dry	D	10		SW6010B	02/06/18 17:43 / eli-b
Molybdenum	1	mg/kg-dry		1		SW6020	02/06/18 19:44 / eli-b
Phosphorus	574	mg/kg-dry	D	20		SW6010B	02/06/18 17:43 / eli-b
Potassium	296	mg/kg-dry	D	60		SW6010B	02/06/18 17:43 / eli-b
Selenium	2	mg/kg-dry		1		SW6020	02/06/18 19:44 / eli-b
Sodium	160	mg/kg-dry	D	30		SW6010B	02/06/18 17:43 / eli-b
Uranium	5	mg/kg-dry		1		SW6020	02/06/18 19:44 / eli-b
Vanadium	20	mg/kg-dry		1		SW6020	02/06/18 19:44 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.004	mg/L		0.001		SW6020	02/13/18 17:13 / eli-b
Selenium	0.011	mg/L		0.001		SW6020	02/15/18 15:50 / eli-b
Uranium	0.0305	mg/L		0.0003		SW6020	02/13/18 17:13 / eli-b
Vanadium	0.05	mg/L		0.01		SW6010B	02/13/18 20:33 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010791-018
Client Sample ID: DD2-BK-65-66-012318

Report Date: 02/26/18
Collection Date: 01/23/18 14:20
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	15.1	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	7610	mg/kg-dry	D	10		SW6010B	02/06/18 17:47 / eli-b
Calcium	22000	mg/kg-dry	D	30		SW6010B	02/06/18 17:47 / eli-b
Iron	11100	mg/kg-dry	D	10		SW6010B	02/06/18 17:47 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 19:47 / eli-b
Phosphorus	372	mg/kg-dry	D	20		SW6010B	02/06/18 17:47 / eli-b
Potassium	1300	mg/kg-dry	D	60		SW6010B	02/06/18 17:47 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 19:47 / eli-b
Sodium	298	mg/kg-dry	D	30		SW6010B	02/06/18 17:47 / eli-b
Uranium	1	mg/kg-dry		1		SW6020	02/06/18 19:47 / eli-b
Vanadium	16	mg/kg-dry		1		SW6020	02/06/18 19:47 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.007	mg/L		0.001		SW6020	02/13/18 17:16 / eli-b
Selenium	0.001	mg/L		0.001		SW6020	02/15/18 15:53 / eli-b
Uranium	0.0080	mg/L		0.0003		SW6020	02/13/18 17:16 / eli-b
Vanadium	0.12	mg/L		0.01		SW6010B	02/13/18 20:48 / eli-b

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: D2974										Batch: R294214
Lab ID: C18010791-001BDUP	Sample Duplicate					Run: BAL HZW1_180205A				02/02/18 14:00
Moisture		8.62	wt%	0.20				6.1	30	
Lab ID: C18010791-011BDUP	Sample Duplicate					Run: BAL HZW1_180205A				02/02/18 14:00
Moisture		12.5	wt%	0.20				4.3	30	
Lab ID: C18010791-018BDUP	Sample Duplicate					Run: BAL HZW1_180205A				02/02/18 14:00
Moisture		17.0	wt%	0.20				12	30	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B									Analytical Run: ICP204-B_180206A	
Lab ID: QCS	6	Initial Calibration Verification Standard							02/06/18 11:19	
Aluminum		3.92	mg/L	0.10	98	90	110			
Calcium		40.4	mg/L	1.0	101	90	110			
Iron		4.12	mg/L	0.030	103	90	110			
Phosphorus		8.12	mg/L	0.10	102	90	110			
Potassium		41.5	mg/L	1.0	104	90	110			
Sodium		41.4	mg/L	1.0	103	90	110			
Lab ID: ICSA	6	Interference Check Sample A							02/06/18 11:22	
Aluminum		498	mg/L	0.10	100	80	120			
Calcium		462	mg/L	1.0	92	80	120			
Iron		180	mg/L	0.11	90	80	120			
Phosphorus		-0.00100	mg/L	0.10						
Potassium		0.0331	mg/L	1.0						
Sodium		0.113	mg/L	1.0						
Lab ID: ICSAB	6	Interference Check Sample AB							02/06/18 11:27	
Aluminum		490	mg/L	0.10	98	80	120			
Calcium		458	mg/L	1.0	92	80	120			
Iron		179	mg/L	0.11	89	80	120			
Phosphorus		9.47	mg/L	0.10	95	80	120			
Potassium		20.4	mg/L	1.0	102	80	120			
Sodium		20.4	mg/L	1.0	102	80	120			
Method: SW6010B									Batch: 118169	
Lab ID: MB-118169	6	Method Blank				Run: ICP204-B_180206A			02/06/18 15:48	
Aluminum		ND	mg/kg	0.6						
Calcium		5	mg/kg	4						
Iron		ND	mg/kg	2						
Phosphorus		0.9	mg/kg	0.3						
Potassium		3	mg/kg	3						
Sodium		8	mg/kg	2						
Lab ID: SRM-118169	6	Standard Reference Material				Run: ICP204-B_180206A			02/06/18 15:52	
Aluminum		8630	mg/kg	9.9	98	11	189			
Calcium		2910	mg/kg	30	94	85	115			
Iron		3860	mg/kg	9.9	90	72	128			
Phosphorus		368	mg/kg	20	89	70	130			
Potassium		2810	mg/kg	50	91	80	120			
Sodium		4400	mg/kg	30	96	85	115			
Lab ID: C18010791-014BDIL	6	Serial Dilution				Run: ICP204-B_180206A			02/06/18 17:11	
Aluminum		1760	mg/kg-dry	51				2.1	10	
Calcium		13600	mg/kg-dry	150				5.9	10	
Iron		4830	mg/kg-dry	51				5.8	10	
Phosphorus		179	mg/kg-dry	100				2.8	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Batch: 118169
Lab ID: C18010791-014BDIL	6	Serial Dilution				Run: ICP204-B_180206A			02/06/18 17:11	
Potassium		295	mg/kg-dry	250				2.0	10	
Sodium		95.6	mg/kg-dry	150					10	N
Lab ID: C18010791-014BPDS	6	Post Digestion/Distillation Spike				Run: ICP204-B_180206A			02/06/18 17:23	
Aluminum		1980	mg/kg-dry	10		75	125			A
Calcium		15000	mg/kg-dry	31		75	125			A
Iron		4550	mg/kg-dry	10		75	125			A
Phosphorus		677	mg/kg-dry	21	96	75	125			
Potassium		2800	mg/kg-dry	52	96	75	125			
Sodium		2670	mg/kg-dry	31	99	75	125			
Lab ID: C18010791-014BMS3	6	Sample Matrix Spike				Run: ICP204-B_180206A			02/06/18 17:27	
Aluminum		3760	mg/kg-dry	10		75	125			A
Calcium		11900	mg/kg-dry	31		75	125			A
Iron		8250	mg/kg-dry	10		75	125			A
Phosphorus		655	mg/kg-dry	21	94	75	125			
Potassium		3070	mg/kg-dry	51	108	75	125			
Sodium		2660	mg/kg-dry	31	100	75	125			
Lab ID: C18010791-014BMSD	6	Sample Matrix Spike Duplicate				Run: ICP204-B_180206A			02/06/18 17:31	
Aluminum		4440	mg/kg-dry	10		75	125	16	20	A
Calcium		28700	mg/kg-dry	31		75	125	83	20	AR
Iron		5650	mg/kg-dry	10		75	125	37	20	AR
Phosphorus		627	mg/kg-dry	21	88	75	125	4.3	20	
Potassium		3190	mg/kg-dry	51	113	75	125	3.9	20	
Sodium		2650	mg/kg-dry	31	100	75	125	0.4	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

N - The analyte concentration was not sufficiently high to calculate a RPD for the serial dilution test.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B									Analytical Run: ICP204-B_180213B	
Lab ID: QCS		Initial Calibration Verification Standard							02/13/18 11:38	
Vanadium		0.806	mg/L	0.10	101	90	110			
Lab ID: ICSA		Interference Check Sample A							02/13/18 12:24	
Vanadium		0.00413	mg/L	0.10						
Lab ID: ICSAB		Interference Check Sample AB							02/13/18 12:28	
Vanadium		0.472	mg/L	0.10	94	80	120			
Method: SW6010B									Batch: 118411	
Lab ID: MB-118411		Method Blank				Run: ICP204-B_180213B			02/13/18 17:17	
Vanadium		ND	mg/L	0.007						
Lab ID: LCS-118411		Laboratory Control Sample				Run: ICP204-B_180213B			02/13/18 17:21	
Vanadium		0.481	mg/L	0.010	96	80	120			
Lab ID: LCSD-118411		Laboratory Control Sample Duplicate				Run: ICP204-B_180213B			02/13/18 17:25	
Vanadium		0.496	mg/L	0.010	99	80	120	3.2	20	
Lab ID: C18010791-001ADIL		Serial Dilution				Run: ICP204-B_180213B			02/13/18 17:33	
Vanadium		ND	mg/L	0.067					10	
Lab ID: C18010791-001AMS3		Sample Matrix Spike				Run: ICP204-B_180213B			02/13/18 17:36	
Vanadium		1.05	mg/L	0.013	100	75	125			
Lab ID: C18010791-002AMS3		Sample Matrix Spike				Run: ICP204-B_180213B			02/13/18 17:44	
Vanadium		0.967	mg/L	0.013	97	75	125			
Lab ID: C18010791-003AMS3		Sample Matrix Spike				Run: ICP204-B_180213B			02/13/18 18:00	
Vanadium		1.12	mg/L	0.013	99	75	125			
Lab ID: C18010791-004AMS3		Sample Matrix Spike				Run: ICP204-B_180213B			02/13/18 18:08	
Vanadium		0.993	mg/L	0.013	99	75	125			
Lab ID: C18010791-005AMS3		Sample Matrix Spike				Run: ICP204-B_180213B			02/13/18 18:16	
Vanadium		1.06	mg/L	0.013	99	75	125			
Lab ID: C18010791-006AMS3		Sample Matrix Spike				Run: ICP204-B_180213B			02/13/18 18:24	
Vanadium		1.11	mg/L	0.013	101	75	125			
Lab ID: C18010791-007AMS3		Sample Matrix Spike				Run: ICP204-B_180213B			02/13/18 18:31	
Vanadium		1.12	mg/L	0.013	102	75	125			
Lab ID: C18010791-008AMS3		Sample Matrix Spike				Run: ICP204-B_180213B			02/13/18 18:47	
Vanadium		1.03	mg/L	0.013	100	75	125			
Lab ID: C18010791-009AMS3		Sample Matrix Spike				Run: ICP204-B_180213B			02/13/18 18:55	
Vanadium		1.12	mg/L	0.013	99	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6010B**										Batch: 118411
Lab ID: **C18010791-010AMS3**		Sample Matrix Spike				Run: ICP204-B_180213B				02/13/18 19:03
Vanadium		1.04	mg/L	0.013	101	75	125			
Lab ID: **C18010791-011AMS3**		Sample Matrix Spike				Run: ICP204-B_180213B				02/13/18 19:11
Vanadium		1.17	mg/L	0.013	104	75	125			
Lab ID: **C18010791-012AMS3**		Sample Matrix Spike				Run: ICP204-B_180213B				02/13/18 19:19
Vanadium		1.05	mg/L	0.013	100	75	125			
Lab ID: **C18010791-013AMS3**		Sample Matrix Spike				Run: ICP204-B_180213B				02/13/18 20:01
Vanadium		0.997	mg/L	0.013	98	75	125			
Lab ID: **C18010791-014AMS3**		Sample Matrix Spike				Run: ICP204-B_180213B				02/13/18 20:09
Vanadium		1.03	mg/L	0.013	100	75	125			
Lab ID: **C18010791-014AMSD**		Sample Matrix Spike Duplicate				Run: ICP204-B_180213B				02/13/18 20:13
Vanadium		1.03	mg/L	0.013	99	75	125	0.4	20	
Lab ID: **C18010791-015AMS3**		Sample Matrix Spike				Run: ICP204-B_180213B				02/13/18 20:21
Vanadium		0.995	mg/L	0.013	99	75	125			
Lab ID: **C18010791-016AMS3**		Sample Matrix Spike				Run: ICP204-B_180213B				02/13/18 20:29
Vanadium		1.05	mg/L	0.013	100	75	125			
Lab ID: **C18010791-017AMS3**		Sample Matrix Spike				Run: ICP204-B_180213B				02/13/18 20:37
Vanadium		1.04	mg/L	0.013	99	75	125			
Lab ID: **C18010791-018AMS3**		Sample Matrix Spike				Run: ICP204-B_180213B				02/13/18 20:52
Vanadium		1.15	mg/L	0.013	103	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Analytical Run: ICPMS202-B_180206A	
Lab ID: QCS	4	Initial Calibration Verification Standard							02/06/18 15:14	
Molybdenum		0.0478	mg/L	0.0010	96	90	110			
Selenium		0.0501	mg/L	0.0010	100	90	110			
Uranium		0.0199	mg/L	0.00030	100	90	110			
Vanadium		0.0491	mg/L	0.0010	98	90	110			
Lab ID: ICSA	4	Interference Check Sample A							02/06/18 15:35	
Molybdenum		0.821	mg/L	0.0010	103	70	130			
Selenium		-0.000130	mg/L	0.0010						
Uranium		-0.0000900	mg/L	0.00030						
Vanadium		0.0000600	mg/L	0.0010						
Lab ID: ICSAB	4	Interference Check Sample AB							02/06/18 15:38	
Molybdenum		0.812	mg/L	0.0010	102	70	130			
Selenium		0.00904	mg/L	0.0010	90	70	130			
Uranium		-0.0000900	mg/L	0.00030						
Vanadium		0.0191	mg/L	0.0010	96	70	130			
Method: SW6020									Batch: 118169	
Lab ID: MB-118169	4	Method Blank				Run: ICPMS202-B_180206A			02/06/18 18:11	
Molybdenum		0.01	mg/kg	0.009						
Selenium		ND	mg/kg	0.04						
Uranium		ND	mg/kg	0.001						
Vanadium		ND	mg/kg	0.2						
Lab ID: C18010791-014BDIL	4	Serial Dilution				Run: ICPMS202-B_180206A			02/06/18 19:12	
Molybdenum		0.650	mg/kg-dry	1.0					10	N
Selenium		ND	mg/kg-dry	1.0					10	
Uranium		1.25	mg/kg-dry	1.0				15	10	R
Vanadium		6.62	mg/kg-dry	2.1					10	N
Lab ID: C18010791-014BPDS	4	Post Digestion/Distillation Spike				Run: ICPMS202-B_180206A			02/06/18 19:15	
Molybdenum		14.6	mg/kg-dry	1.0	106	75	125			
Selenium		12.7	mg/kg-dry	1.0	98	75	125			
Uranium		15.2	mg/kg-dry	1.0	106	75	125			
Vanadium		20.8	mg/kg-dry	1.0	104	75	125			
Lab ID: SRM-118169	4	Standard Reference Material				Run: ICPMS202-B_180206A			02/06/18 19:18	
Molybdenum		58.6	mg/kg	1.0	101	80	120			
Selenium		43.8	mg/kg	1.0	103	79	121			
Uranium		1.36	mg/kg	1.0		0	0			
Vanadium		73.9	mg/kg	1.0	102	81	119			
Lab ID: C18010791-014BMS3	4	Sample Matrix Spike				Run: ICPMS202-B_180206A			02/06/18 19:20	
Molybdenum		54.3	mg/kg-dry	1.0	104	75	125			
Selenium		51.5	mg/kg-dry	1.0	100	75	125			
Uranium		56.8	mg/kg-dry	1.0	108	75	125			

Qualifiers:

RL - Analyte reporting limit.

N - The analyte concentration was not sufficiently high to calculate a RPD for the serial dilution test.

ND - Not detected at the reporting limit.

R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020										Batch: 118169
Lab ID: C18010791-014BMS3	4	Sample Matrix Spike				Run: ICPMS202-B_180206A				02/06/18 19:20
Vanadium		68.8	mg/kg-dry	1.0	120	75	125			
Lab ID: C18010791-014BMSD	4	Sample Matrix Spike Duplicate				Run: ICPMS202-B_180206A				02/06/18 19:23
Molybdenum		53.5	mg/kg-dry	1.0	102	75	125	1.4	20	
Selenium		51.3	mg/kg-dry	1.0	100	75	125	0.5	20	
Uranium		56.2	mg/kg-dry	1.0	106	75	125	1.1	20	
Vanadium		65.4	mg/kg-dry	1.0	113	75	125	5.1	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Analytical Run: ICPMS202-B_180213A	
Lab ID: QCS	3	Initial Calibration Verification Standard							02/13/18 13:08	
Molybdenum		0.0477	mg/L	0.0010	95	90	110			
Uranium		0.0189	mg/L	0.00030	94	90	110			
Vanadium		0.0485	mg/L	0.0010	97	90	110			
Lab ID: ICSA	3	Interference Check Sample A							02/13/18 13:30	
Molybdenum		0.829	mg/L	0.0010	104	70	130			
Uranium		-0.0000400	mg/L	0.00030						
Vanadium		0.0000900	mg/L	0.0010						
Lab ID: ICSAB	3	Interference Check Sample AB							02/13/18 13:32	
Molybdenum		0.843	mg/L	0.0010	105	70	130			
Uranium		-0.0000600	mg/L	0.00030						
Vanadium		0.0210	mg/L	0.0010	105	70	130			
Method: SW6020									Batch: 118411	
Lab ID: MB-118411	3	Method Blank				Run: ICPMS202-B_180213A			02/13/18 16:09	
Molybdenum		0.0010	mg/L	0.00004						
Uranium		0.0002	mg/L	0.00002						
Vanadium		ND	mg/L	0.0007						
Lab ID: C18010791-001ADIL	3	Serial Dilution				Run: ICPMS202-B_180213A			02/13/18 16:15	
Molybdenum		0.00920	mg/L	0.0010				7.8	10	
Uranium		0.00911	mg/L	0.00030				0.7	10	
Vanadium		0.0632	mg/L	0.010					10	N
Lab ID: LCS-118411	3	Laboratory Control Sample				Run: ICPMS202-B_180213A			02/13/18 17:18	
Molybdenum		0.520	mg/L	0.0010	104	80	120			
Uranium		0.572	mg/L	0.00030	114	80	120			
Vanadium		0.506	mg/L	0.010	101	80	120			
Lab ID: LCSD-118411	3	Laboratory Control Sample Duplicate				Run: ICPMS202-B_180213A			02/13/18 17:21	
Molybdenum		0.526	mg/L	0.0010	105	80	120	1.1	20	
Uranium		0.570	mg/L	0.00030	114	80	120	0.3	20	
Vanadium		0.529	mg/L	0.010	106	80	120	4.4	20	
Lab ID: C18010791-001AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A			02/13/18 17:23	
Molybdenum		1.07	mg/L	0.0010	106	75	125			
Uranium		1.15	mg/L	0.00030	114	75	125			
Vanadium		1.12	mg/L	0.010	105	75	125			
Lab ID: C18010791-002AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A			02/13/18 17:26	
Molybdenum		1.03	mg/L	0.0010	103	75	125			
Uranium		1.11	mg/L	0.00030	110	75	125			
Vanadium		1.03	mg/L	0.010	102	75	125			
Lab ID: C18010791-003AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A			02/13/18 17:28	
Molybdenum		0.985	mg/L	0.0010	98	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

N - The analyte concentration was not sufficiently high to calculate a RPD for the serial dilution test.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020										Batch: 118411
Lab ID: C18010791-003AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:28
Uranium		1.16	mg/L	0.00030	115	75	125			
Vanadium		1.16	mg/L	0.010	103	75	125			
Lab ID: C18010791-004AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:31
Molybdenum		1.04	mg/L	0.0010	104	75	125			
Uranium		1.13	mg/L	0.00030	112	75	125			
Vanadium		0.983	mg/L	0.010	97	75	125			
Lab ID: C18010791-005AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:33
Molybdenum		1.04	mg/L	0.0010	103	75	125			
Uranium		1.14	mg/L	0.00030	113	75	125			
Vanadium		1.09	mg/L	0.010	102	75	125			
Lab ID: C18010791-006AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:44
Molybdenum		1.00	mg/L	0.0010	100	75	125			
Uranium		1.12	mg/L	0.00030	111	75	125			
Vanadium		1.12	mg/L	0.010	101	75	125			
Lab ID: C18010791-007AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:46
Molybdenum		1.03	mg/L	0.0010	102	75	125			
Uranium		1.14	mg/L	0.00030	113	75	125			
Vanadium		1.12	mg/L	0.010	102	75	125			
Lab ID: C18010791-008AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:49
Molybdenum		1.02	mg/L	0.0010	101	75	125			
Uranium		1.10	mg/L	0.00030	110	75	125			
Vanadium		1.04	mg/L	0.010	101	75	125			
Lab ID: C18010791-009AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:51
Molybdenum		1.02	mg/L	0.0010	101	75	125			
Uranium		1.18	mg/L	0.00030	117	75	125			
Vanadium		1.16	mg/L	0.010	103	75	125			
Lab ID: C18010791-010AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:54
Molybdenum		0.975	mg/L	0.0010	97	75	125			
Uranium		1.18	mg/L	0.00030	118	75	125			
Vanadium		1.05	mg/L	0.010	102	75	125			
Lab ID: C18010791-011AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:56
Molybdenum		0.986	mg/L	0.0010	98	75	125			
Uranium		1.16	mg/L	0.00030	116	75	125			
Vanadium		1.18	mg/L	0.010	105	75	125			
Lab ID: C18010791-012AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:58
Molybdenum		0.996	mg/L	0.0010	99	75	125			
Uranium		1.16	mg/L	0.00030	115	75	125			
Vanadium		1.03	mg/L	0.010	99	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020										Batch: 118411
Lab ID: C18010791-012AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 17:58
Lab ID: C18010791-013AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 18:01
Molybdenum		1.04	mg/L	0.0010	99	75	125			
Uranium		1.29	mg/L	0.00030	111	75	125			
Vanadium		0.996	mg/L	0.010	98	75	125			
Lab ID: C18010791-014AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 18:03
Molybdenum		1.04	mg/L	0.0010	101	75	125			
Uranium		1.24	mg/L	0.00030	119	75	125			
Vanadium		1.03	mg/L	0.010	100	75	125			
Lab ID: C18010791-014AMSD	3	Sample Matrix Spike Duplicate				Run: ICPMS202-B_180213A				02/13/18 18:06
Molybdenum		1.02	mg/L	0.0010	99	75	125	2.2	20	
Uranium		1.18	mg/L	0.00030	113	75	125	4.7	20	
Vanadium		1.01	mg/L	0.010	98	75	125	2.3	20	
Lab ID: C18010791-015AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 18:16
Molybdenum		1.02	mg/L	0.0010	102	75	125			
Uranium		1.17	mg/L	0.00030	116	75	125			
Vanadium		1.01	mg/L	0.010	101	75	125			
Lab ID: C18010791-016AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 18:19
Molybdenum		1.00	mg/L	0.0010	100	75	125			
Uranium		1.14	mg/L	0.00030	114	75	125			
Vanadium		1.05	mg/L	0.010	100	75	125			
Lab ID: C18010791-017AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 18:21
Molybdenum		0.977	mg/L	0.0010	97	75	125			
Uranium		1.15	mg/L	0.00030	112	75	125			
Vanadium		0.997	mg/L	0.010	96	75	125			
Lab ID: C18010791-018AMS3	3	Sample Matrix Spike				Run: ICPMS202-B_180213A				02/13/18 18:24
Molybdenum		1.00	mg/L	0.0010	99	75	125			
Uranium		1.19	mg/L	0.00030	118	75	125			
Vanadium		1.11	mg/L	0.010	99	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ED_004985_00011411-00296

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Analytical Run: ICPMS202-B_180214A	
Lab ID: QCS	2	Initial Calibration Verification Standard							02/14/18 12:31	
Molybdenum		0.0478	mg/L	0.0010	96	90	110			
Uranium		0.0196	mg/L	0.00030	98	90	110			
Lab ID: ICSA	2	Interference Check Sample A							02/14/18 12:52	
Molybdenum		0.822	mg/L	0.0010	103	70	130			
Uranium		-0.0000700	mg/L	0.00030						
Lab ID: ICSAB	2	Interference Check Sample AB							02/14/18 12:55	
Molybdenum		0.845	mg/L	0.0010	106	70	130			
Uranium		-0.0000900	mg/L	0.00030						
Method: SW6020									Batch: 118411	
Lab ID: MB-118411	2	Method Blank				Run: ICPMS202-B_180214A			02/14/18 14:47	
Molybdenum		0.0008	mg/L	0.00004						
Uranium		0.00004	mg/L	0.00002						
Lab ID: C18010791-001ADIL	2	Serial Dilution				Run: ICPMS202-B_180214A			02/14/18 14:53	
Molybdenum		0.00707	mg/L	0.0010				17	10	R
Uranium		0.00758	mg/L	0.00030				14	10	R
Lab ID: LCS-118411	2	Laboratory Control Sample				Run: ICPMS202-B_180214A			02/14/18 15:56	
Molybdenum		0.535	mg/L	0.0010	107	80	120			
Uranium		0.532	mg/L	0.00030	106	80	120			
Lab ID: LCSD-118411	2	Laboratory Control Sample Duplicate				Run: ICPMS202-B_180214A			02/14/18 16:49	
Molybdenum		0.543	mg/L	0.0010	108	80	120	1.5	20	
Uranium		0.570	mg/L	0.00030	114	80	120	7.0	20	
Lab ID: C18010791-004AMS3	2	Sample Matrix Spike				Run: ICPMS202-B_180214A			02/14/18 16:59	
Molybdenum		0.984	mg/L	0.0010	98	75	125			
Uranium		1.12	mg/L	0.00030	112	75	125			

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
R - RPD exceeds advisory limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Analytical Run: ICPMS202-B_180215A	
Lab ID: **QCS**		Initial Calibration Verification Standard							02/15/18 11:06	
Selenium		0.0508	mg/L	0.0010	102	90	110			
Lab ID: **ICSA**		Interference Check Sample A							02/15/18 11:38	
Selenium		0.000150	mg/L	0.0010						
Lab ID: **ICSAB**		Interference Check Sample AB							02/15/18 11:40	
Selenium		0.00933	mg/L	0.0010	93	70	130			
Method: **SW6020**									Batch: 118411	
Lab ID: **MB-118411**		Method Blank				Run: ICPMS202-B_180215A			02/15/18 11:27	
Selenium		ND	mg/L	0.0003						
Lab ID: **LCS-118411**		Laboratory Control Sample				Run: ICPMS202-B_180215A			02/15/18 11:30	
Selenium		0.407	mg/L	0.0010	81	80	120			
Lab ID: **LCSD-118411**		Laboratory Control Sample Duplicate				Run: ICPMS202-B_180215A			02/15/18 11:33	
Selenium		0.411	mg/L	0.0010	82	80	120	1.1	20	
Lab ID: **C18010791-001ADIL**		Serial Dilution				Run: ICPMS202-B_180215A			02/15/18 14:52	
Selenium		ND	mg/L	0.0051					10	
Lab ID: **C18010791-001AMS3**		Sample Matrix Spike				Run: ICPMS202-B_180215A			02/15/18 15:55	
Selenium		0.833	mg/L	0.0010	83	75	125			
Lab ID: **C18010791-002AMS3**		Sample Matrix Spike				Run: ICPMS202-B_180215A			02/15/18 15:58	
Selenium		0.824	mg/L	0.0010	82	75	125			
Lab ID: **C18010791-003AMS3**		Sample Matrix Spike				Run: ICPMS202-B_180215A			02/15/18 16:00	
Selenium		0.834	mg/L	0.0010	83	75	125			
Lab ID: **C18010791-004AMS3**		Sample Matrix Spike				Run: ICPMS202-B_180215A			02/15/18 16:03	
Selenium		0.829	mg/L	0.0010	83	75	125			
Lab ID: **C18010791-005AMS3**		Sample Matrix Spike				Run: ICPMS202-B_180215A			02/15/18 16:05	
Selenium		0.842	mg/L	0.0010	84	75	125			
Lab ID: **C18010791-006AMS3**		Sample Matrix Spike				Run: ICPMS202-B_180215A			02/15/18 16:16	
Selenium		0.843	mg/L	0.0010	84	75	125			
Lab ID: **C18010791-007AMS3**		Sample Matrix Spike				Run: ICPMS202-B_180215A			02/15/18 16:18	
Selenium		0.823	mg/L	0.0010	82	75	125			
Lab ID: **C18010791-008AMS3**		Sample Matrix Spike				Run: ICPMS202-B_180215A			02/15/18 16:21	
Selenium		0.840	mg/L	0.0010	84	75	125			
Lab ID: **C18010791-009AMS3**		Sample Matrix Spike				Run: ICPMS202-B_180215A			02/15/18 16:23	
Selenium		0.820	mg/L	0.0010	82	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Report Date: 02/20/18
Project: Grants Reclamation Project
Work Order: C18010791

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020										Batch: 118411
Lab ID: C18010791-010AMS3		Sample Matrix Spike				Run: ICPMS202-B_180215A				02/15/18 16:25
Selenium		0.842	mg/L	0.0010	84	75	125			
Lab ID: C18010791-011AMS3		Sample Matrix Spike				Run: ICPMS202-B_180215A				02/15/18 16:28
Selenium		0.840	mg/L	0.0010	84	75	125			
Lab ID: C18010791-012AMS3		Sample Matrix Spike				Run: ICPMS202-B_180215A				02/15/18 16:30
Selenium		0.850	mg/L	0.0010	85	75	125			
Lab ID: C18010791-013AMS3		Sample Matrix Spike				Run: ICPMS202-B_180215A				02/15/18 16:33
Selenium		0.843	mg/L	0.0010	84	75	125			
Lab ID: C18010791-014AMS3		Sample Matrix Spike				Run: ICPMS202-B_180215A				02/15/18 16:35
Selenium		0.845	mg/L	0.0010	85	75	125			
Lab ID: C18010791-014AMSD		Sample Matrix Spike Duplicate				Run: ICPMS202-B_180215A				02/15/18 16:38
Selenium		0.858	mg/L	0.0010	86	75	125	1.5	20	
Lab ID: C18010791-015AMS3		Sample Matrix Spike				Run: ICPMS202-B_180215A				02/15/18 16:56
Selenium		0.854	mg/L	0.0010	85	75	125			
Lab ID: C18010791-016AMS3		Sample Matrix Spike				Run: ICPMS202-B_180215A				02/15/18 16:59
Selenium		0.836	mg/L	0.0010	83	75	125			
Lab ID: C18010791-017AMS3		Sample Matrix Spike				Run: ICPMS202-B_180215A				02/15/18 17:01
Selenium		0.845	mg/L	0.0010	83	75	125			
Lab ID: C18010791-018AMS3		Sample Matrix Spike				Run: ICPMS202-B_180215A				02/15/18 17:03
Selenium		0.812	mg/L	0.0010	81	75	125			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Work Order Receipt Checklist

Homestake Mining Co

C18010791

Login completed by: Dorian Quis
Date Received: 1/30/2018

Reviewed by: Kasey Vidick
Received by: kak

Reviewed Date: 2/1/2018
Carrier name: NDA

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	6.1°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

ED_004985_00011411-00301

Chain of Custody & Analytical Request Record

ENERGY LAB — Trust our People. Trust our Data.

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Account Information (Billing information)

Company/Name	Homestake Mining Company
Contact	Tom Wohlford
Phone	505. 290. 2187
Mailing Address	PO Box 98
City, State, Zip	Grants, NM 87020
Email	twohlford@barrick.com
Receive Invoice	☐ Hard Copy ☒ Email
Receive Report	☐ Hard Copy ☒ Email
Purchase Order	
Quote	5105
Bottle Order	54217

Report Information (if different than Account Information)

Company/Name	Arcadis
Contact	Shannon Ulrich
Phone	865. 771. 2397
Mailing Address	630 Plaza Drive, Ste 100
City, State, Zip	Highlands Ranch, CO 80129
Email	shannon.ulrich@arcadis.com
Receive Report	☐ Hard Copy ☒ Email
Special Report/Formats:	Excel/EQuIS
☐ LEVEL IV ☐ NELAC ☒ EDD/EDT (contact laboratory) ☐ Other	

Comments

Contact Tracey Archer upon receipt.

Hold DCM Labs samples until Arcadis approves transfer.

Project Information

Project Name, PWSID, Permit, etc.	Grants Reclamation Project
Sampler Name	Shannon Ulrich
Sampler Phone	865. 771. 2397
Sample Origin State	NM
EPA/State Compliance	☐ Yes ☒ No

URANIUM MINING CLIENTS MUST indicate sample type. Background location

☐ Unprocessed Ore
☐ Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11(e)2 Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes

A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.

Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	SPLP variation Mo, Se, U, V	Total metals: Al, Ca, Fe, Mo, P, K, Se, Na, U, V	Sample for DCM Labs (please hold)	See Attached	RUSH TAT	ELI LAB ID (Lab Use Only)
1	DD2-BK-36-37-012618	1.26.18	1450	3	S	X	X	X			
2	DD2-BK-60-61-012618	1.26.18	1505	3	S	X	X	X			C18010791
3	DD2-BK-67-68-012618	1.26.18	1535	3	S	X	X	X			
4	~~DUP~~			3	S	X	X	X	SMU		
5	DD-BK-9-10-012518	1.25.18	1550	3	S	X	X	X			
6	DD-BK-30-31-012518	1.25.18	1620	3	S	X	X	X			
7	DD-BK-36-37-012518	1.25.18	1640	3	S	X	X	X	SMU		
8											
9											
10									SMU		

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Shannon Ulrich	1/29/18 / 1530	SU	UPS		
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					1/30/18 7:52	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check	Amount $	Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-11/17 v.2

ED_004985_00011411-00302

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Chain of Custody & Analytical Request Record

www.energylab.com

Account Information (Billing information)

Company/Name	Homestake Mining Company
Contact	Tom Wohlford
Phone	505. 290. 2187
Mailing Address	PO Box 98
City, State, Zip	Grants, NM 87020
Email	twohlford@barrick.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	505
Bottle Order	54217

Report Information (if different than Account Information)

Company/Name	Arcadis
Contact	Shannon Ulrich
Phone	865. 771-2397
Mailing Address	630 Plaza Drive, Ste 100
City, State, Zip	Highlands Ranch, CO 80129
Email	shannon.ulrich@arcadis.com
Receive Report	☐Hard Copy ☒Email

Special Report/Formats: Excel/ EQuIS
☐ LEVEL IV ☐ NELAC ☒EDD/EDT (contact laboratory) ☐ Other

Comments

Contact Tracey Archer upon receipt.
Hold DCM labs samples until Arcadis approves transfer.

Project Information

Project Name, PWSID, Permit, etc.	Grants Reclamation Project
Sampler Name	Shannon Ulrich
Sampler Phone	865. 771. 2397
Sample Origin State	NM
EPA/State Compliance	☐ Yes ☒No

URANIUM MINING CLIENTS MUST indicate sample type. Background location
☐ Unprocessed Ore
☐ Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11(e)2 Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
A - Air
W - Water
S - Soils/ Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	SPLP variation SMM Mo, Se, B, U, V	Total Metals: Al, Ca, Fe, Mo, P, K, Se, Na, U, V	DCM Labs samples (please hold)	See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1 DD-BK-66-67-012518	1.25.18	1725	3	S	X	X	X			
2 DD-BK-27-28-012618 SMM	1.26.18	1300	3	S	X	X	X			
3 DD-BK-39-40-012618	1.26.18	1320	3	S	X	X	X			C18010791
4 DD-BK-58-59-012618	1.26.18	1330	3	S	X	X	X			
5 DD-BK-63-64-012618	1.26.18	1400	3	S	X	X	X			
6 DUP	—	—	2	S	X	X				
7										
8										
9										
10										

SMM

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Shannon Ulrich	1/29/18 / 1530		UPS		
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					1/30/18 11:42	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check	Amount $	Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-11/17 v.2

ED_004985_00011411-00303

ENERGY LAB
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information (Billing information)

Company/Name	Homestake Mining Company
Contact	Tom Wohlford
Phone	505.290.2187
Mailing Address	PO Box 98
City, State, Zip	Grants, NM 87020
Email	twohlford@barrick.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	5105
Bottle Order	54217

Report Information (if different than Account Information)

Company/Name	Arcadis
Contact	Shannon Ulrich
Phone	865.771.2397
Mailing Address	630 Plaza Drive, Ste 100
City, State, Zip	Highlands Ranch, CO 80129
Email	shannon.ulrich@arcadis.com
Receive Report	☐Hard Copy ☒Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☒ EDD/EDT (contact laboratory) Excel/EQuIS ☐ Other

Comments

Contact Tracey Archer upon receipt.

Hold DCM Labs samples until Arcadis approves transfer.

Project Information

Project Name, PWSID, Permit, etc.	Grants Reclamation Project
Sampler Name	Shannon Ulrich
Sampler Phone	865.771.2397
Sample Origin State	NM
EPA/State Compliance	☐ Yes ☒ No

URANIUM MINING CLIENTS MUST indicate sample type. Background location
☐ Unprocessed Ore
☐ Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11(e)2 Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes

A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.

Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Analysis Requested: SPLP vanadium Mo, Se, U, V	Total metals: Al, Ca, Fe, Mg, P, K, Se, Na, U, V	MS/MSD	Sample for DCM Labs (please hold)	See Attached	RUSH TAT	ELI Lab ID (Laboratory Use Only)
1 DD2-BK-11-12-012218	1.22.18	1509	3 SMU	S	X	X		X			
2 DD2-BK-25-26-012218	1.22.18	1520	3 SMU	S	X	X	X	X			
3 DD2-BK-51-52-012318	1.23.18	1250	3 SMU	S	X	X		X			
4 DD2-BK-56-57-012318	1.23.18	1315	3 SMU	S	X	X		X			
5 DD2-BK-71-72-012318	1.23.18	1330	3 SMU	S	X	X		X			
6 DD2-BK-65-66-012318	1.23.18	1420	3 SMU	S	X	X		X			
7											
8											
9											
10											

SMU

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Shannon Ulrich	1/29/18 / 1530		UPS		
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
					1/31/18 1058	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check	Amount $	Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-11/17 v.2

Methods for Estimating Adsorbed Uranium(VI) and Distribution Coefficients of Contaminated Sediments

MATTHIAS KOHLER,*,† GARY P. CURTIS,‡ DAVID E. MEECE,† AND JAMES A. DAVIS‡

Environmental Science and Engineering Division, Colorado School of Mines, Golden, Colorado 80401, and U.S. Geological Survey, Menlo Park, California 94025

Assessing the quantity of U(VI) that participates in sorption/desorption processes in a contaminated aquifer is an important task when investigating U migration behavior. U-contaminated aquifer sediments were obtained from 16 different locations at a former U mill tailings site at Naturita, CO (U.S.A.) and were extracted with an artificial groundwater, a high pH sodium bicarbonate solution, hydroxylamine hydrochloride solution, and concentrated nitric acid. With an isotopic exchange method, both a K_D value for the specific experimental conditions as well as the total exchangeable mass of U(VI) was determined. Except for one sample, K_D values determined by isotopic exchange with U-contaminated sediments that were in equilibrium with atmospheric CO_2 agreed within a factor of 2 with K_D values predicted from a nonelectrostatic surface complexation model (NEM) developed from U(VI) adsorption experiments with uncontaminated sediments. The labile fraction of U(VI) and U extracted by the bicarbonate solution were highly correlated ($r^2 = 0.997$), with a slope of 0.96 ± 0.01. The proximity of the slope to one suggests that both methods likely access the same reservoir of U(VI) associated with the sediments. The results indicate that the bicarbonate extraction method is useful for estimating the mass of labile U(VI) in sediments that do not contain U(IV). In-situ K_D values calculated from the measured labile U(VI) and the dissolved U(VI) in the Naturita alluvial aquifer agreed within a factor of 3 with in-situ K_D values predicted with the NEM and groundwater chemistry at each well.

Introduction

A critical aspect of risk assessment and remediation studies at many uranium-contaminated sites is estimating the migration of U(VI) in groundwaters (e.g. refs *1*−*3*). In model simulations, retardation of U(VI) is often estimated based on a distribution coefficient, K_D, or a range of K_D values that is meant to describe the partitioning of U(VI) between the solid and aqueous phases. The distribution coefficient, K_D, is defined by the concentration of sorbed U divided by the concentration of dissolved U, regardless of the solid and solution compositions. In practice, K_D values are generally chosen based on laboratory batch experiments with materials from contaminated sites, single mineral phases, mineral mixtures, crushed rock materials, or on studies/observations at other U-contaminated sites. A significant problem is that many batch experiments performed in the laboratory for K_D values are equilibrated in air and thus do not account for the fact that the partial pressures of carbon dioxide gas are generally greater in aquifers and may undergo seasonal variations (*4*, *5*). K_D values, especially those for U(VI), are dependent on the geochemistry of an aquifer, which can vary temporally and spatially. U(VI) is relatively weakly adsorbed compared to many metal contaminants, and it forms strong aqueous complexes with carbonate.

Numerous batch adsorption studies on natural and synthetic materials have demonstrated the dependence of U(VI) adsorption on pH and carbonate (and other ligands) concentrations in aqueous solutions (*6*−*12*), and variability in K_D values has been the subject of several studies (*8*, *10*, *13*−*18*). Simulations with a constant K_D can, therefore, introduce considerable uncertainty into risk assessment or evaluation of remediation alternatives. Methods are needed to estimate K_D values in the field ("in-situ") for validation of surface complexation models (SCM) to be used in risk assessment transport models and to constrain the initial conditions in transport modeling.

Lienert et al. (*4*) pointed out that great care should be taken when laboratory K_D values are used to estimate in-situ K_D's. Based on the retarded appearance of a uranium pulse in a well at a distance of 5 m from a river they estimated a K_D of (7 ± 2.5) mL/g. They emphasized that their value was in general much smaller than K_D's obtained in laboratory experiments on mineralogical constituents of the aquifer material (quartz, calcite, K-feldspars, illite, and chlorite).

Over the last two decades many researchers have pointed out the limitations and/or inadequacies of a constant K_D approach for transport modeling (*19*−*21*). More recent transport simulations take advantage of multicomponent reactive transport models, which can account for variable chemical speciation (e.g. refs *22*−*25*). SCMs have provided an approach to describe adsorption processes (through well-defined stoichiometric reactions of surface and aqueous species) rather than the mere distribution between aqueous and solid phases (*26*). This process-oriented approach to adsorption and transport modeling better reflects the dynamic behavior of a complex aquifer system (*27*−*29*). Thus, in addition to hydrogeological parameters, a detailed knowledge of geochemical conditions at a contaminated site is required to make accurate transport simulations in groundwater.

An important initial condition that must be specified for U(VI) transport simulations at U-contaminated sites is the mass and oxidation state of U associated with the contaminated sediments. Several experimental studies have been conducted to evaluate the extent to which U(VI) is associated with natural soils (e.g. ref *30*). Payne and Waite (*31*) showed that exchangeable U of rock samples determined by isotope exchange techniques was comparable to the amount of U extracted by Tamm's acid oxalate (TAO) and determined in-situ K_D values at the Koongarra U deposit in Northern Australia. Mason et al. (*32*) found that a 0.5 M sodium bicarbonate solution was an efficient extractant for U-contaminated soils from the Fernald Environmental Management Project (FEMP). The amount of dissolved U corresponded approximately to the amount of U(VI) present

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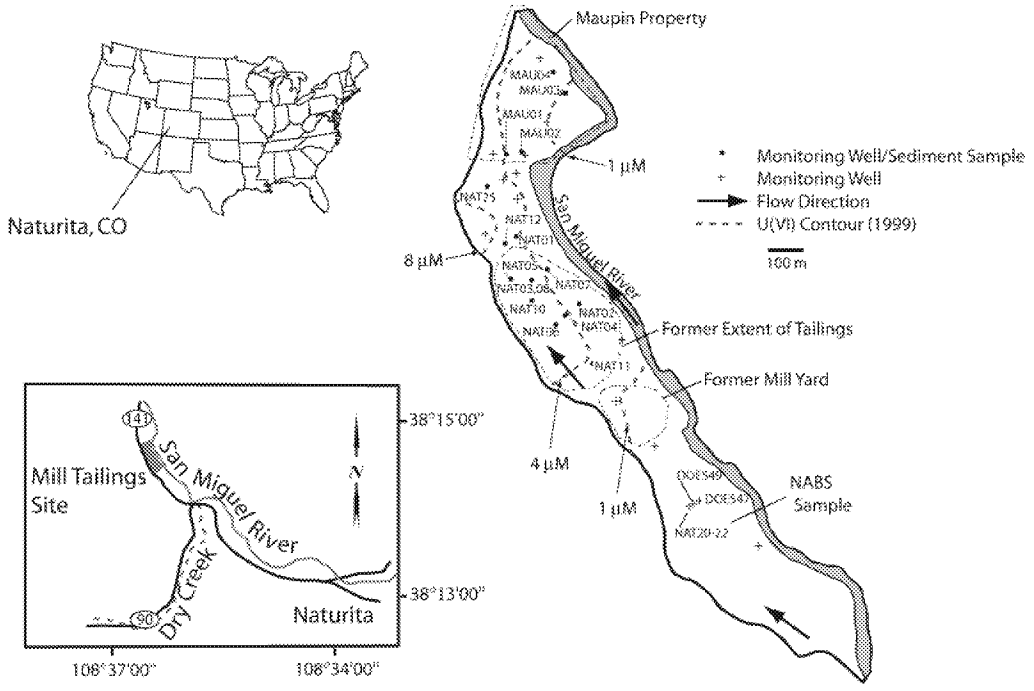

FIGURE 1. Locality map of Naturita, Colorado, U.S.A.

in the soil. Gadelle et al. (*33*) tested the efficiency of surfactants and bicarbonate (among other extractants) for the extraction of U(VI) adsorbed under laboratory conditions onto Oak Ridge soils. Bicarbonate was as efficient as the surfactants as long as the pH of the extracting solutions remained high.

None of the studies above was focused on developing experimental methods for quantifying initial adsorbed U(VI) for reactive solute transport modeling. The overall objective of this study is to evaluate various methods to determine the labile fraction of U(VI) sorbed on U-contaminated sediments collected at the Naturita Uranium Mill Tailings Remediation Act (UMTRA) site (a list of abbreviations is given in the Supporting Information). Specific objectives are as follows: (1) to assess total exchangeable U by isotopic exchange and to compare the results to the quantities of U extracted from the contaminated sediments by various extractants in order to determine if any of the extraction methods provide a good estimate for sorbed U(VI) on the U-contaminated sediments and (2) to estimate in-situ K_D values for the sediments and compare them with K_D values obtained from a surface complexation model developed to describe U(VI) adsorption by uncontaminated sediments from the Naturita site.

Methods and Materials

The Naturita Field Site. The Naturita UMTRA site is located in southwestern Colorado in Montrose County, about 3 km northwest of the town of Naturita, and on the west bank of the San Miguel River (Figure 1). At the Naturita site uranium- (U) and vanadium (V) ores were processed at the site between 1939 and the early 1980s (*34*). Stockpiled tailings were removed from the Naturita site in 1979. Surface remediation of the site began in 1994 and was completed in 1998 (*35*). U and V were extracted from the ores by salt roasting, followed by carbonate leaching in percolation tanks. Carbonate leach residues were then sent to a second stage of sulfuric acid percolation leaching. Leach tails were slurried onto the land surface at the site, in an area downgradient of the mill yard between State Highway 141 and the river. The climate of the area is semiarid; annual precipitation is approximately 33 cm. Off-site disposal of U−V tailings from the site was completed during 1977−1979. Contaminated soils and vadose zone materials were removed from the site between 1996 and 1998, and the excavated areas were filled in with clean backfill. U(VI) contamination in groundwater at the site has been observed primarily within an unconfined, shallow alluvial aquifer composed of sand, gravel, pebbles, and cobbles. The San Miguel River recharges the aquifer. The saturated thickness of the alluvial aquifer is about 3−4 m.

Materials. Experiments were conducted on 16 samples collected from U-contaminated alluvial sediments and with a sample of uncontaminated sediments from the aquifer (referred to as Naturita Aquifer Background Sediment or NABS). The NABS sample was collected in July 1998, using a backhoe to collect sediments from beneath the water table in an area upgradient of wells DOE-547 and NAT-20, -21, and -22 (Figure 1). Cobbles (>64 mm) were removed with a coarse mesh in the field. A total of 734 kg of wet material was placed in sealed plastic buckets and transferred to the laboratory for detailed processing and characterization. U-contaminated sediments were collected from auger flights during the installation of monitoring wells in October 1998 or with a hand auger at a few selected locations during 2000−2001. Sample NAT-25B was collected in September 2000 with a hand auger at a location about 2 m from the monitoring well NAT-25. The collected sediments were drained and collected into sealed plastic buckets. The sediments were air-dried in the laboratory, dry sieved through 3 mm nylon mesh, and stored at 4 °C in the dark. Sample NAT-25J was collected in September 2001 with a hand auger at a location about 3 m from NAT-25 and 4 m from site NAT-25B. Sample NAT-25J was neither air-dried nor sieved and was used immediately in glovebag experiments in the field as described below. All other experiments described in this study were carried out with the air-dried <3 mm fractions.

***K_D* Determinations.** K_D is calculated from

$$K_D = 1000 \cdot \frac{C_s}{C} \qquad (1)$$

where C_s is the concentration of sorbed U(VI) on the sediment in mol/g, C is the concentration of total dissolved U(VI) in M (mol/L), and K_D is commonly given in units of mL/g (the

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factor 1000 in eq 1 accounts for the conversion of liters into milliliters). In this work two different methods were used to determine the concentration of sorbed U(VI): (1) an extraction of the sediments with a bicarbonate solution and (2) an isotope exchange technique. Both methods are described below. For the concentration of the total dissolved U(VI), actual values of the groundwater were used.

Methods. Analytical methods such as kinetic phosphorescence analysis (KPA) for U(VI); Fe, V, Mn, and Ca analysis by inductively coupled argon plasma atomic emission spectrometry (ICP-AES); alpha activity of ^{233}U by liquid scintillation counting (LSC); and alkalinities and measurements of dissolved oxygen and Fe(II) in the field are given in the Supporting Information and in ref *11*. BET surface areas of the samples were measured on a Tristar Micromeritics system and are given in Table S4 of the Supporting Information. The presence of the major mineralogical components quartz, feldspars, calcite, and layer silicates in NABS was confirmed by XRD. A detailed mineralogical characterization is given in ref *11*.

Four different media were used for the extraction of the sediments. A hot concentrated nitric acid extraction, a 50 °C hydroxylamine hydrochloride (HA·HCl) extraction, an extraction in dilute bicarbonate/carbonate solution at pH 9.4 (CARB), and a desorption/extraction in the artificial groundwater followed by isotopic exchange in the same medium were conducted. All the methods are described elsewhere (*11*). This work focuses on the extractions with bicarbonate solution (CARB) and artificial groundwater followed by isotopic exchange, and the methods are outlined below.

Sodium (Bi)carbonate Extractions. The sodium bicarbonate/carbonate solution (CARB) used as an extractant was $1.44 \cdot 10^{-2}$ M in $NaHCO_3$ and $2.8 \cdot 10^{-3}$ M in Na_2CO_3. Its calculated ionic strength was 0.022 M, with a measured pH of 9.45 ± 0.05, and its alkalinity was 20 mequiv/L. The solid-to-liquid ratio was 50 g/L. Kinetic data were collected with sampling times ranging from 1 h to 12−14 days. Samples were filtered (0.45 μm) and acidified for U(VI) analysis (KPA) and other metals (ICP-AES).

Artificial Groundwater Extractions. The sediment samples were extracted with an artificial groundwater solution, referred to as AGW-3, which had a composition based on an average groundwater composition for well DOE-549 (Figure 1). To conduct experiments equilibrated with air, the alkalinity (HCO_3^-) of AGW-3 was significantly reduced relative to DOE-549 water. To keep the ionic strength near 0.02 M, $CaCl_2$ was added. The composition of AGW-3 was $NaHCO_3$ $5.38 \cdot 10^{-4}$ M, KCl $6.4 \cdot 10^{-5}$ M, Na_2SO_4 $9.38 \cdot 10^{-4}$ M, $MgSO_4 \cdot 7H_2O$ $1.515 \cdot 10^{-3}$ M, $CaCl_2$ $2.38 \cdot 10^{-3}$ M, and $CaSO_4 \cdot 2H_2O$ $2.33 \cdot 10^{-3}$ M. HYDRAQL (*36*) calculations gave a pH of 7.88 (for a partial pressure of CO_2 of 373 ppm) and showed that the solution was at saturation with calcite (the thermodynamic database for all solution species considered in this study is given in Table S2 of the Supporting Information). Prior to contact with the sediment samples, AGW-3 was first equilibrated with the NABS sediment sample for several days. This preequilibration step was performed to minimize subsequent pH changes during the extractions of the samples. In the course of this preequilibration step, AGW-3 acquired $5.0 \cdot 10^{-9}$ M to $8.4 \cdot 10^{-9}$ M (1.2−2 ppb) dissolved U(VI) from the NABS sample. Samples were filtered (0.45 μm), converted to the nitrate system (see Supporting Information), and acidified for U(VI) analysis (KPA).

Isotopic Exchange Experiments. Isotopic exchange experiments were initiated at the conclusion of the AGW-3 desorption extractions described above by spiking the suspensions with $6-9 \cdot 10^{-9}$ M ^{233}U (0.5−0.75 Bq/mL) as uranyl nitrate. Several supernatant samples were taken during the first week of isotopic exchange, and one sample was taken after 10 months (details are given in ref *11*). The ^{233}U alpha activity in the supernatant was measured for each sample (by LSC), and total dissolved U(VI) was measured twice by KPA during each experiment. Alkalinities were measured at the end of the 10-month period.

The concentration of labile U in each experiment, C_{labile} (M), was calculated by

$$C_{labile} = \frac{A_{System}}{A} \cdot C \qquad (2)$$

where A_{system} is the total ^{233}U activity (Bq/L) in the system, A is the activity of dissolved ^{233}U (Bq/L), and C (M) is the concentration of total dissolved U(VI) measured by KPA. C_{labile} was calculated in each experiment by measuring C and the ^{233}U activity, A. A_{System} was calculated from the known initial addition of ^{233}U activity to the experiment. Several corrections (described in detail in the Supporting Information) were made for U introduced as ^{233}U-tracer, U introduced with pretreated AGW-3, and U removed during sampling. C_{labile} (M) can be converted to C^*_{labile} in units of mol/g of solid by multiplying by the liquid/solid ratio, V/w (L/g), in each experiment.

Results

Total U by γ-Spectrometry, Extractions with Nitric Acid, and Hydroxylamine Hydrochloride. The total U content of the samples was quantified by nondestructive measurement of the 63 keV line of ^{234}Th in secular equilibrium with ^{238}U (Figure 2). A value of $9.6 \cdot 10^{-9}$ mol/g U (2.3 ppm) was found for the NABS sample, within the range typical of granitic rocks. All other samples, with the exception of the sample from NAT-11, had significantly higher total U concentrations than the NABS sample. Results of the nitric acid (HNO_3) extractions and hydroxylamine hydrochloride (HA·HCl) extractions are included in Figure 2 for comparison. Linear correlations (Figures S1 and S2) for U determined by γ-spectrometry, HNO_3 and HA·HCl, and a brief discussion are given in the Supporting Information.

Bicarbonate Extractable U − Laboratory. The objective of the bicarbonate extractions was to quantitatively desorb U(VI) from the sediment surfaces by strong aqueous complexation of U(VI) with carbonate with minimal dissolution of the crystalline matrix. Tamm's acid oxalate (TAO (*31*)) would destroy carbonate minerals and was therefore not used in this study. Steady-state concentrations of dissolved U(VI) were achieved after 120 h of extraction with CARB solution (*11*). Extracted U in mol/g is shown in Figure 2. For all samples, during the first 48 h of extraction, the pH and Ca^{2+} concentration in the extracts decreased, indicating that a small amount of calcite was likely precipitated as illustrated in Figure 3 for NAT-06. Except for NAT-06, the pH remained higher than 8.6 throughout the extraction in all samples and speciation calculations with HYDRAQL (*36*) show that the species $UO_2(CO_3)_3^{4-}$, $UO_2(CO_3)_2^{2-}$, $CaUO_2(CO_3)_3^{2-}$, and $Ca_2UO_2(CO_3)_3^0{}_{aq}$ constitute essentially all the dissolved U(VI). (A speciation diagram of U(VI) reflecting a typical species distribution for Naturita field conditions is given in Figure S5 in the Supporting Information and will be discussed below). For sample NAT-06, pH decreased during the extraction from 9.4 to 8.1 in the first 300 h (Figure 3). After 1850 h of extraction, the pH was adjusted from 8.2 back to 9.4. As shown in Figure 3, the pH adjustment had no measurable effect on the concentration of dissolved U(VI). Ca^{2+} decreased because of additional calcite precipitation (note the pH decreased again after the initial pH adjustment upward). Extracted V increased after the adjustment of pH, suggesting that an anionic V species was incompletely desorbed. The fact that extracted U did not change after pH adjustment indicates that U(VI) desorption during the first 120 h of the extraction was complete. Extractions with CARB solution are relatively mild compared to the concentrated

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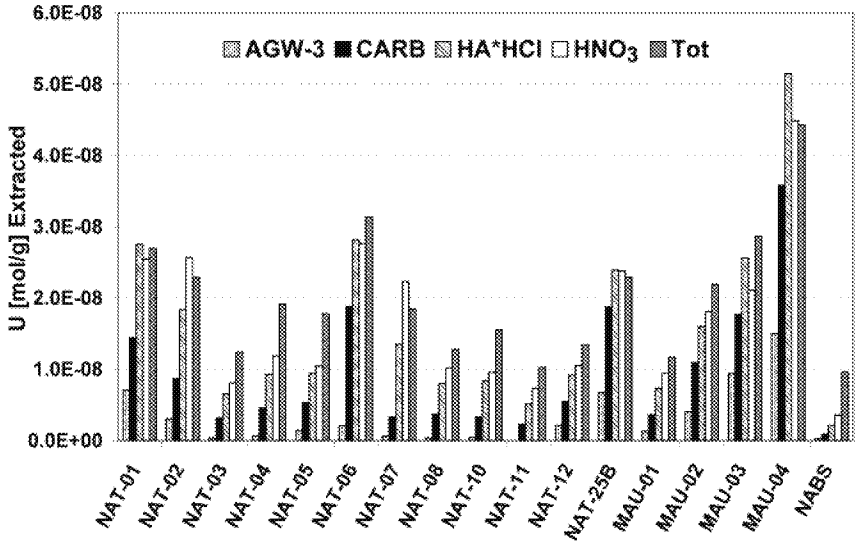

FIGURE 2. Comparison of the amount U extracted (in mol/g) from contaminated sediments and NABS by different extraction methods (artificial groundwater AGW-3, bicarbonate solution CARB, hydroxylamine hydrochloride solution HA·HCl, and concentrated nitric acid HNO_3. Total U content of the sediments determined by γ-spectrometry is given for comparison).

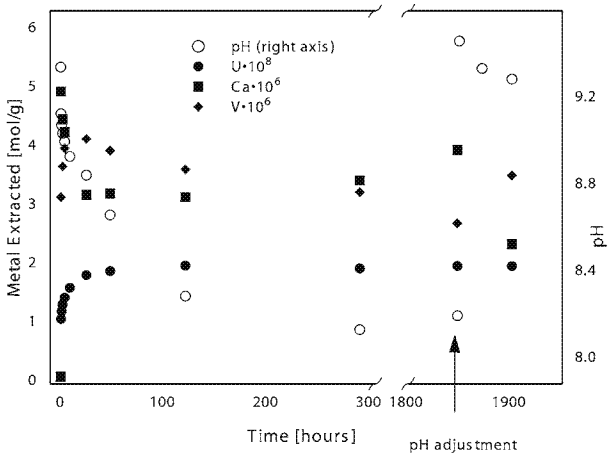

FIGURE 3. Extracted U, V, and Ca from the NAT-06 sediment sample by the CARB solution as a function of extraction time. Readjustment of pH after 1850 h.

nitric and HA·HCl extractions, and CARB was not expected to cause significant dissolution of the mineral matrices.

Bicarbonate Extractable U — Field. An experiment was conducted in the field under oxygen exclusion in order to determine if exposure to air influenced the amount of U being extracted from the sediments by the CARB solution. A subsample of sample NAT-25J was extracted under oxygen exclusion, and the results were compared to CARB extractions of other subsamples after exposure to air in the field and several weeks later in the laboratory. Since the U-contaminated sediments extracted in the laboratory (described above) were air-dried, U(IV) on the sediment surfaces could have been oxidized prior to the extraction. If this occurred, U(VI) extracted by the CARB solution might be interpreted as desorption of U(VI) from the sediments, when in fact the U had been present as U(IV) in the subsurface prior to sampling. By performing the CARB extraction in the field under a nitrogen atmosphere directly after sampling NAT-25J, oxidation of U(IV) would be minimized. U(IV) is highly insoluble, even in the presence of high carbonate concentrations (see the Supporting Information).

The average U(VI) extracted from fresh sediments in the field experiments was $(5.5 \pm 2.6)\cdot10^{-9}$ mol/g and $(4.8 \pm 1.5)\cdot10^{-9}$ mol/g under N_2 and in air atmosphere, respectively. These values compare favorably with the average value of $(4.6 \pm 1.5)\cdot10^{-9}$ mol/g for air-dried sediments (see Table S1 in the Supporting Information). Despite the variability in U extracted, the comparison of extractions under N_2 atmosphere and in air suggest that the U extracted was predominantly present as U(VI) on the NAT-25J sample. However, as this test was only performed on the one sample, the presence of U(IV) in the subsurface cannot be ruled out at other locations in the aquifer.

Artificial Groundwater Extractable U. Dissolved U(VI) concentrations increased rapidly over the first 48−96 h of contact with AGW-3 solution (Figure S3), but the total amount of U extracted was relatively small.

Comparing the values among the four extraction methods (Figure 2), it is clear that the two hot acidic treatments were most efficient in dissolving U from the sediments. However, the CARB extraction was also quite efficient, and for some of the samples, U extracted by the CARB solution approached the values obtained by the acidic treatments (e.g., NAT-06, NAT-25B, MAU-03, and MAU-04). This may be interpreted to mean most of the contaminant U in these samples was present as sorbed U(VI) that could be easily desorbed with the CARB solution. The AGW-3 extractions released the least amount of U. This was expected because the strong mineral acids partly attack the bulk of the minerals, exchange against sorbed U, or dissolve solid U phases. In the CARB solution the carbonate activity is significantly higher than in AGW-3.

Isotopic Exchange Experiments. There were two objectives for the isotope exchange experiments: (1) obtain a K_D value for U(VI) adsorption in suspensions equilibrated with air (in the discussion below, we use only the term, K_D, the distribution coefficient, although equilibrium may not have been achieved in all cases) and (2) quantify the amount of isotopically exchangeable U(VI) in the U-contaminated samples, hereafter referred to as "labile U". The quantity of labile U(VI) in each experiment can be obtained from the mass balances for U(VI) and ^{233}U(VI) (eq 2). Because of oxic conditions, it is assumed that no ^{233}U(VI) is reduced by the sediment surfaces and that no dissolved U(IV) is present. The labile fraction of total U in each experiment includes all U atoms that participate in dynamic chemical processes (sorption, desorption, precipitation, dissolution, oxidation) that achieve equilibrium with the aqueous phase. Within the time scale of the experiment, ^{233}U(VI) tracer is distributed between the aqueous and sediment phases by these dynamic

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TABLE 1. Comparison of Experimental K_D's with Surface Complexation Model (NEM) Simulated K_D's for Field ("In-Situ") Conditions at the Naturita Field Site and Laboratory Conditions[f]

	lab conditions		field conditions		
sediment	isotope exchange	NEM	CARB[a]	isotope exchange[a]	NEM
NAT-01	9.52	13.1	4.01	4.24	2.16
NAT-02	10.9	15.2	4.63	5.22	3.25
NAT-03	23.9	32.8	0.80	0.941	3.45
NAT-04	18.1	37.9	1.14	1.21	3.04
NAT-05	18.9	30.5	1.39	1.63	3.15
NAT-06	46.3	27.0	3.56	3.95	4.01
NAT-07	22.6	42.3	1.44	1.75	4.01
NAT-08	24.1	33.0	0.80	0.857	2.56
NAT-10	18.3	28.8	0.73	0.961	2.60
NAT-11	26.1	46.3	0.45	0.513	3.42
NAT-12	19.5	19.4	1.18	1.46	2.36
MAU-01	10.0	18.9	1.62	2.13	2.34
MAU-02	22.5	18.2	6.66	7.38	4.70
MAU-03	8.65	7.73	21.9	25.1	2.91
MAU-04	11.72	8.64	35.4	36.9	3.42
NABS[b]	*d*	*d*	31.1[d]	19.9	4.41
NABS[c]	*d*	*d*	16.0[e]	10.3	2.60

[a] U solid concentration in mol/g determined experimentally by either carbonate extraction or isotope exchange, and for the solution concentration the actual U concentration was used. [b] For averaged conditions for DOE-547 from Apr 2, 1999 to Sep 10, 2001; [Alk] = 3.20 mequiv/L, pH 7.29, and $2.8 \cdot 10^{-8}$ M U (6.7 ppb U). [c] For averaged conditions reported for NAT-20, −21, and −22 from Sep 21, 1999 to Sep 10, 2001; [Alk] = 4.72 mequiv/L, pH 6.99, and $5.43 \cdot 10^{-8}$ M U (12.9 ppb U). [d] Depending on solid-to-liquid ratio K_D varies from 6.5 to 16.8 mL/g for isotopic exchange, and NEM calculated values range from 16 to 28 mL/g. [e] The U concentration on the solid based on CARB extraction is $8.7 \cdot 10^{-10}$ mol/g and is taken from Davis and Curtis (*11*). [f] Units of K_D's are mL/g.

processes, and at isotopic equilibrium, it can be assumed that all U(VI) isotopes *in the labile fraction* are distributed in a similar manner.

K_D values (Table 1) and labile fractions of total U were determined for each of the 15 U-contaminated samples (not for NAT-25B) and for NABS (Table 1). Development of solution activities over time during isotope exchange is shown in Figure S4.

U Solution Speciation. HYDRAQL (*36*) calculations show that the $Ca_2UO_2(CO_3)_3^0{}_{aq}$ complex is the prevalent species under Naturita field conditions as well as under conditions of AGW-3 extractions and isotopic exchange experiments in the laboratory conducted in this study. The complex $UO_2(CO_3)_3^{4-}$ is of secondary importance, whereas $UO_2(CO_3)_2^{2-}$ and $CaUO_2(CO_3)_3^{2-}$ are species below 5% (see Figure S5).

Discussion

Comparison of K_D Values for Contaminated Sediments and NABS for CO_2(g) in Air. Use of the ^{233}U tracer in the isotopic exchange experiments allows a direct determination of the distribution coefficient, K_D, for each sediment sample. K_D can be determined solely by ^{233}U activity measurements according to eq 3

$$K_D = 1000 \cdot \frac{V}{w} \cdot \left(\frac{C_{labile}}{C} - 1 \right) = 1000 \cdot \frac{V}{w} \cdot \left(\frac{A_{System}}{A} - 1 \right) \quad (3)$$

where V/w is the solution-to-solid ratio of the system in L/g and the other parameters were defined above (eq 2). It is important to note that C_{labile} only refers to the labile fraction of U(VI) that participates in isotope exchange processes and does not include U fixed in the mineral matrix.

Table 1 shows the K_D values determined by isotopic exchange under laboratory conditions. K_D values for the contaminated sediment samples with alkalinities between 1.4 and 2.3 mequiv/L fell into a relatively narrow range of 9−26 mL/g (with the exception of NAT-06, 46 mL/g). This range of K_D values for the contaminated sediments compares well with the range 6.5−17 mL/g (with alkalinities of 0.8−1.4 mequiv/L) measured for the background NABS sample in systems equilibrated with air (Table 1, footnote d). Concentrations of both total U(VI) and the alkalinity were higher for the contaminated sediments than for NABS, whereas pH values fell within the range of 7.9 ± 0.2 for both sample series (see Table S5 in the Supporting Information). A possible reason that the samples acquired different alkalinites were different equilibration times for the isotopic exchange experiments on the contaminated sediments (10 months) and on NABS (7−9 days). The effects of pH, alkalinity, and total dissolved U(VI) on K_D values will be discussed below when a SCM is applied to the experimental data to calculate K_D.

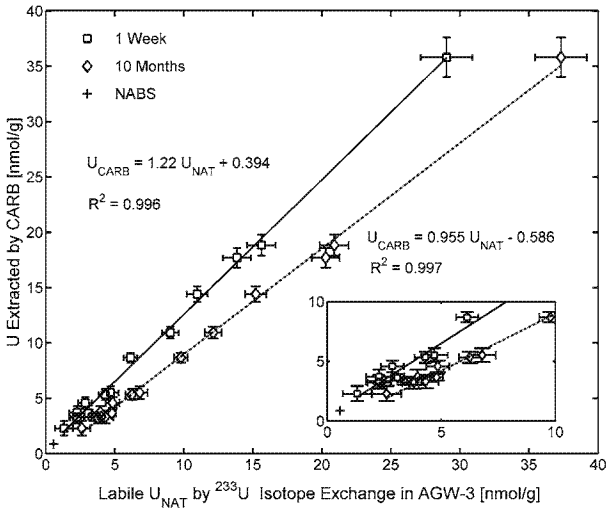

FIGURE 4. Relation between labile U(VI) determined by isotopic exchange measurements with U(VI) extracted by the CARB solution for 15 U-contaminated sediment samples and NABS. CARB extraction lasted 2 weeks, isotope exchange 1 week and 10 months.

Comparison of Isotopic Exchange with CARB Extracted U. If there was no oxidation of U(IV) on the sediments during air-drying, then it is likely that the measured labile fraction of sediment U(VI) is equivalent to adsorbed U(VI), since U(VI) solid phases were undersaturated in Naturita groundwater. The CARB extraction was designed to desorb U(VI) without dissolving the crystalline matrix, so a comparison of these results is warranted. Figure 4 shows plots of U(VI) extracted by the CARB solution (2 weeks) versus the labile fractions of sediment U(VI) determined by 1 week or 10 months of isotopic exchange. U(VI) extracted by the CARB solution is very well correlated with results obtained for both sets of isotope exchange data. For the 1-week exchange data, the slope, intercept, and R^2 of a linear regression line are 1.22 ± 0.02, $(3.9 \pm 2.2) \cdot 10^{-10}$ mol/g, and 0.996, respectively, indicating that the CARB extracted U(VI) was, on average, 22% greater than that determined by isotopic exchange for 1 week. After 10 months, the labile fraction estimated from isotope exchange was within 5% of the CARB extraction data but slightly higher. The corresponding values of a linear regression line are 0.96 ± 0.01, $(-5.9 \pm 2.0) \cdot 10^{-10}$ mol/g, and 0.997 for slope, intercept, and R^2, respectively. The proximity of the slope to one suggests that both methods likely access essentially the same reservoir of U(VI). These results are encouraging because they suggest that the CARB extraction method is a rapid, mild, very practical, inexpensive, and simple experimental technique to determine the labile U(VI) in contaminated sediments.

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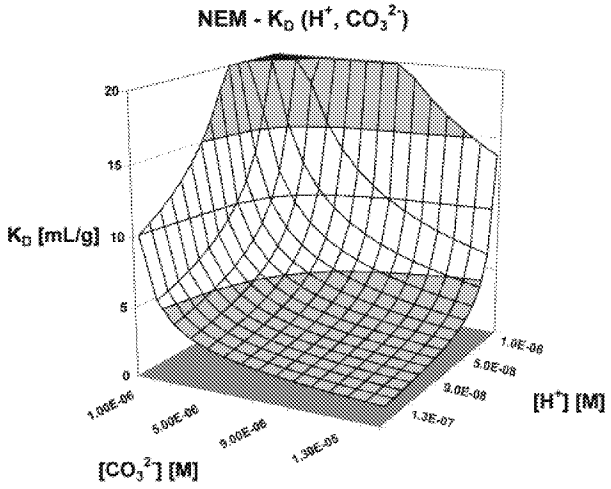

FIGURE 5. NEM simulations of K_D values as a function of proton and carbonate ion concentrations. The range of proton concentrations and carbonate ion concentration covers the entire space of the variables for conditions encountered at the Naturita field site (pH 6.8–7.4 and alkalinities 3–10 mequiv/L) as well as laboratory conditions (pH 7.8–8.0, alkalinities 1–2.4 mequiv/L). The total dissolved U(VI) concentration is $3 \cdot 10^{-6}$ M.

For the NABS sample, 7–9 days of isotopic exchange gave a concentration of labile uranium of $(5.57 \pm 0.22) \cdot 10^{-10}$ mol/g in excellent agreement with the value obtained from the 1-week carbonate extraction of $5.7 \cdot 10^{-10}$ mol/g. A 3-week carbonate extraction gave a somewhat higher value of $8.7 \cdot 10^{-10}$ mol/g. Possible reasons for this difference might be sample inhomogeneities.

Calculation of In-Situ Field K_D. In the alluvial aquifer at Naturita, pH values range from 6.8 to 7.4, alkalinities from 2.5 to 10 mequiv/L, and dissolved U(VI) from $2 \cdot 10^{-8}$ M to $1 \cdot 10^{-5}$ M (*11*). From the alkalinities and pH, equilibrium partial pressures of CO_2 were calculated, yielding values between 0.6 and 7%. The increased levels of CO_2(g) in the aquifer are thought to be the result of biological activity that occurs primarily after river water recharges the alluvial aquifer. Because of the lower alkalinities and partial pressures of CO_2, K_D values measured in the isotopic exchange experiments are expected to be higher than those that apply under field conditions, since formation of aqueous Ca–U(VI)–carbonato complexes (Table S2 in the Supporting Information) at higher alkalinities should lower the K_D values (see Figure 5 and discussion below). Table 1 gives estimates of in-situ K_D values, based on the measured U(VI) concentration in groundwater (Table S4) and the estimates of adsorbed U(VI) from the CARB extractions and isotopic exchange experiments with sediments from the same location. With the exception of MAU-03 and MAU-04, note how the in-situ K_D values (Table 1, columns 4 and 5) are considerably smaller than the air-equilibrated laboratory values (Table 1, column 2).

In practice, most K_D values used in performance assessment modeling of U(VI) transport in groundwater are based on laboratory adsorption experiments with uncontaminated sediments in systems equilibrated with atmospheric levels of CO_2(g) (*13*). Thus, the CARB extraction can be very useful for studies of U-contaminated sites because the extraction can provide an independent estimate of field adsorbed U(VI), so that K_D values can be calculated under in-situ aquifer conditions.

Comparison with Nonelectrostatic Surface Complexation Model (NEM) K_D's. A nonelectrostatic surface complexation model (NEM) was developed to describe U(VI) adsorption by the NABS sample under conditions of variable U(VI) concentrations, pH values, and partial pressures of CO_2(g). The modeling strategy, model calibration, and details of the model are given in ref *11* and are summarized in the Supporting Information. The reaction stoichiometries and stability constants for reactions involving surface sites are given in Table S3 in the Supporting Information (stability constants for solution species are listed in Table S2 in the Supporting Information).

K_D values computed with the NEM can be compared with both K_D values observed at the end of the AGW-3 extractions and K_D values calculated for the in-situ field conditions. In the case of AGW-3 extractions, experimental values for the specific surface area, pH, alkalinity, total dissolved uranium, and solid-solution ratio used in the laboratory experiments were used as input to the NEM calculations (Table S5 in the Supporting Information). Equilibrium with calcite was assumed. Table 1 (column 3) compares the model-predicted K_D values with those determined at the end of isotope exchange experiments in AGW-3 solutions (column 2). Many of the model-predicted K_D values agree very well with the measured ones, and all except NAT-04 are within a factor of 2. The fact that the only sediment characterization involved in the model input was the specific surface area leads to the hypothesis that the variability in U(VI) K_D values is largely due to variation of aqueous chemical conditions. Pabalan et al. (*14*) and Davis et al. (*10*) have observed that a wide range of K_D values for U(VI) obtained for many different solids could be reduced to a single parameter, K_a [mL/m^2], that varied only with aqueous conditions. K_a values are obtained by dividing K_D by the specific surface area of the solid phase.

Observed and NEM-predicted K_D values for the < 3 mm material under in-situ conditions are listed in Table 1 (columns 4–6, respectively). The model predictions were performed using field data (pH, alkalinity, dissolved U(VI), Na^+, K^+, Mg^{2+}, Cl^-, and SO_4^{2-}, see Table S4 in the Supporting Information) for each individual well in conjunction with the measured specific surface areas of the contaminated sediment sample from each well. Equilibrium with calcite was assumed in the simulations. The predicted K_D values are compared with observed K_D values determined from both the CARB extractions and the isotopic exchange experiments (Table 1). The model-predicted K_D values generally agree to within a factor of 2–3 with the estimates from the experimental data, which is a very encouraging result. The results show that isotopic exchange and desorption extraction methods that are custom-designed for the appropriate site environmental conditions can be an important part of a field characterization and modeling program. The experimental determinations of adsorbed U(VI) in the Naturita alluvial aquifer build confidence in the semiempirical SCM (such as NEM) developed from experimental data with uncontaminated sediments and may improve the credibility of the initial conditions of transport simulations for the aquifer.

The dependence of K_D on proton and carbonate concentrations was simulated with NEM and is shown in Figure 5 for total dissolved U(VI) of $3 \cdot 10^{-6}$ M. Typical values for major ions were chosen (Na^+ $1 \cdot 10^{-2}$ M, K^+ $6 \cdot 10^{-4}$ M, Mg^{2+} $3 \cdot 10^{-3}$ M, Cl^- $2 \cdot 10^{-3}$ M, SO_4^{2-} $8 \cdot 10^{-3}$ M). The system was assumed to be in equilibrium with calcite. For the specific surface area a value of 12.9 m^2/g was chosen (average of the contaminated sediments). The range of the two variables covered in Figure 5 reflects the experimental conditions in the laboratory and in the field investigated in this study (pH 6.8–8 and carbonate concentrations of $1 \cdot 10^{-6}$–$1.5 \cdot 10^{-5}$ M corresponding to alkalinities of 1–10 mequiv/L). Figure 5 shows a rapidly decreasing K_D both with increasing proton and carbonate concentrations. At a total dissolved U(VI) concentration of $3 \cdot 10^{-8}$ M and low proton concentration the K_D values are approximately a factor of 3 higher than at $3 \cdot 10^{-6}$ M for all carbonate concentrations. However, the difference becomes smaller at high proton and high carbonate concentrations.

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The exceptions for the good predictive capability of NEM for samples in this study are in-situ K_D values for the sediments from wells MAU-03 and MAU-04, for which the model-predicted values are about an order of magnitude lower than those estimated from the experimental data. A possible reason for the discrepancies in the model-predicted values for the MAU-03 and MAU-04 locations is that these wells are the only ones at the site located in a downgradient, marshy area with cottonwood and willow trees. The average dissolved oxygen is $2.2 \cdot 10^{-5}$ M (0.7 ppm) at MAU-04 and $6.3 \cdot 10^{-6}$ M (0.2 ppm) at MAU-03 and the average Fe(II) values are $9 \cdot 10^{-7}$ M (0.050 ppm) and $2.4 \cdot 10^{-5}$ M (1.34 ppm), respectively. The average Fe(II) for all wells is $8.4 \cdot 10^{-6}$ M (0.47 ppm). The Fe(II) concentration $2.24 \cdot 10^{-5}$ M (1.25 ppm) measured at well MAU-04 in the field in the fall of 1998 (when the sediment was sampled) was higher than at other locations in the alluvial aquifer, and springs that emanate from near the water table downgradient of MAU-03 and MAU-04 had red Fe-bearing precipitates. Although the glovebag CARB extractions conducted in the field suggested that there was little U(IV) associated with NAT-25J sediments (Table S1 in the Supporting Information), it is possible that there was U(IV) associated with the MAU-03 and MAU-04 sediments at the time of sampling in 1998. Because the sediments were later air-dried, any U(IV) in surface coatings was likely oxidized to U(VI) and then desorbed during the CARB extractions or the isotopic exchange experiments. This could lead to overestimates of in-situ U(VI) K_D values in the experimental "observations" in comparison to the model-predicted values. Field experiments with fresh sediments from wells MAU-03 and MAU-04 to assess the oxidation state of U will be part of a future project.

Comparison of in-situ U(VI) K_D values in the uncontaminated portion of the aquifer is complicated by several factors, especially the choice of groundwater concentrations of U(VI), alkalinity, and pH. Also, for the NABS sample, there is a factor of approximately 1.6 between the experimentally determined K_D values from the carbonate extraction (3-week) and isotopic exchange methods. The NABS sample was collected by a backhoe below a gravel pit that had been excavated to the groundwater table. Unfortunately, groundwater samples were not collected at the same time and location. The average chemical conditions after 1999 at well DOE-547 were pH 7.29, alkalinity 3.2 mequiv/L, and U(VI) $2.8 \cdot 10^{-8}$ M (6.7 ppb U) which leads to a calculated K_D of 4.41 mL/g (Table 1). NEM calculations show that the predicted K_D values are particularly sensitive to alkalinity at values below 4 mequiv/L. One water sample collected in November 2000 at DOE 547 had an alkalinity of 2.48 mequiv/L, pH 7.16, and U(VI) $1.85 \cdot 10^{-8}$ M, which yields a predicted K_D of 5.49. The latter predicted value agrees better with the observed K_D of 10.3 mL/g determined from isotopic exchange measurements and average water concentrations.

Acknowledgments

This work was supported by the U.S. Nuclear Regulatory Commission (Interagency Agreement RES-97-009) and the U.S. Geological Survey Toxic Substances Hydrology program. We thank David Naftz and Chris Wilkowske of USGS, Utah District office for field assistance, Chris Fuller for conducting the total U determinations, H. Nitsche and Linfeng Rao (Lawrence Berkeley National Lab) for providing us with a ^{233}U tracer solution, Doug Kent, Jennifer Joye, Brent Topping, and Patricia Fox for valuable assistance in the laboratory. The use of trade names in this paper is for identification purposes only and does not constitute endorsement of the U.S. Geological Survey. We thank David Naftz and Edward Landa, USGS, and three anonymous reviewers for valuable comments and reviews of the manuscript.

Supporting Information Available

Analytical methods, modeling of U(VI) adsorption data on NABS with a nonelectrostatic surface complexation model (NEM), Tables S1–S5, and Figures S1–S5. This material is available free of charge via the Internet at http://pubs.acs.org.

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ANALYTICAL SUMMARY REPORT

February 28, 2018

Homestake Mining Co
Hwy 605
Grants, NM 87020

Work Order: C18010792 Quote ID: C5105 - SPLP and Total Metals

Project Name: Grants Reclamation Project

Energy Laboratories, Inc. Casper WY received the following 2 samples for Homestake Mining Co on 1/30/2018 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C18010792-001	DD-BK-15-16-012518	01/25/18 16:05	01/30/18	Soil	Metals by ICP/ICPMS, Total Metals by ICP/ICPMS, SPLP Moisture Percent Moisture Digestion, Total Metals SPLP Extraction, Regular Total Metals Digestion - SPLP
C18010792-002	DD-BK-50-51-012518	01/25/18 17:10	01/30/18	Soil	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Homestake Mining Co
Project: Grants Reclamation Project
Work Order: C18010792

Report Date: 02/28/18

CASE NARRATIVE

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

Per client request, results reported as "Metals, SPLP Extractable" were extracted per SW-846 1312 method using dilute bicarbonate/carbonate solution @ pH 9.4 and solid to liquid ratio of 50g/L as described in "Methods for Estimating Adsorbed Uranium (VI) and Distribution Coefficients of Contaminated Sediments", Environ. Sci. Technol.,2004, 38, 240-247.

NARRATIVE BELOW IS FOR Level IV DATA PACKAGE VALIDATION REPORT ONLY

The results and QC summary report provided in detailed format, and provided as a "preliminary" report in the raw data package and is for data validation purposes only for ELI-Billings report B18020067. The results provided in this report are limited to those parameters subcontracted to and analyzed by the ELI Billings Branch Laboratory for ELI Casper laboratory Workorder C18010792 and with corresponding individual lab numbers.

Included with the analysis reports are instrument data reports for all analysis associated with the instrument calibration, QC sample analysis, and sample analysis. Copies of the detailed laboratory records for the analyses are sorted by method, instrument, and then analysis time. All analytical data is within method QA/QC specifications except as noted on analyses and/or QC summary reports, or in this narrative. The analytical report identifies which QC batch ID and sequence QC is associated with each analysis result for a sample.

Inclusion of the raw data will be found on the attached files. The results of this Analytical Report relate only to the items submitted for analysis. Only the raw data associated with parameters listed on this report should be validated.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010792-001
Client Sample ID: DD-BK-15-16-012518

Report Date: 02/28/18
Collection Date: 01/25/18 16:05
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	2.7	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	3150	mg/kg-dry	D	10		SW6010B	02/06/18 15:56 / eli-b
Calcium	954	mg/kg-dry	D	30		SW6010B	02/06/18 15:56 / eli-b
Iron	4530	mg/kg-dry	D	10		SW6010B	02/06/18 15:56 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:14 / eli-b
Phosphorus	69	mg/kg-dry	D	20		SW6010B	02/06/18 15:56 / eli-b
Potassium	487	mg/kg-dry	D	50		SW6010B	02/06/18 15:56 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:14 / eli-b
Sodium	54	mg/kg-dry	D	30		SW6010B	02/06/18 15:56 / eli-b
Uranium	<1	mg/kg-dry		1		SW6020	02/06/18 18:14 / eli-b
Vanadium	7	mg/kg-dry		1		SW6020	02/06/18 18:14 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.002	mg/L		0.001		SW6020	02/14/18 14:08 / eli-b
Selenium	<0.001	mg/L		0.001		SW6020	02/14/18 14:08 / eli-b
Uranium	0.0018	mg/L		0.0003		SW6020	02/14/18 14:08 / eli-b
Vanadium	0.07	mg/L		0.01		SW6020	02/14/18 14:08 / eli-b

Results reported as "Metals, SPLP Extractable" were extracted per SW-846 1312 method using dilute bicarbonate/carbonate solution @ pH 9.4, and soli to liquid ratio of 50g/L as described in "Methods for Estimating Adsorbed Uranium (VI) and Distribution Coefficients of Contaminated Sediments", Environ. Sci. Technol.,2004, 38, 240-247.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Homestake Mining Co
Project: Grants Reclamation Project
Lab ID: C18010792-002
Client Sample ID: DD-BK-50-51-012518

Report Date: 02/28/18
Collection Date: 01/25/18 17:10
Date Received: 01/30/18
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture	9.6	wt%		0.2		D2974	02/02/18 14:00 / eli-b
METALS, TOTAL							
Aluminum	1970	mg/kg-dry	D	10		SW6010B	02/06/18 16:00 / eli-b
Calcium	2400	mg/kg-dry	D	30		SW6010B	02/06/18 16:00 / eli-b
Iron	5680	mg/kg-dry	D	10		SW6010B	02/06/18 16:00 / eli-b
Molybdenum	<1	mg/kg-dry		1		SW6020	02/06/18 18:17 / eli-b
Phosphorus	211	mg/kg-dry	D	20		SW6010B	02/06/18 16:00 / eli-b
Potassium	339	mg/kg-dry	D	50		SW6010B	02/06/18 16:00 / eli-b
Selenium	<1	mg/kg-dry		1		SW6020	02/06/18 18:17 / eli-b
Sodium	118	mg/kg-dry	D	30		SW6010B	02/06/18 16:00 / eli-b
Uranium	<1	mg/kg-dry		1		SW6020	02/06/18 18:17 / eli-b
Vanadium	7	mg/kg-dry		1		SW6020	02/06/18 18:17 / eli-b
METALS, SPLP EXTRACTABLE							
Molybdenum	0.004	mg/L		0.001		SW6020	02/14/18 14:14 / eli-b
Selenium	<0.001	mg/L		0.001		SW6020	02/14/18 14:14 / eli-b
Uranium	0.0059	mg/L		0.0003		SW6020	02/14/18 14:14 / eli-b
Vanadium	0.06	mg/L		0.01		SW6020	02/14/18 14:14 / eli-b

Results reported as "Metals, SPLP Extractable" were extracted per SW-846 1312 method using dilute bicarbonate/carbonate solution @ pH 9.4, and soli to liquid ratio of 50g/L as described in "Methods for Estimating Adsorbed Uranium (VI) and Distribution Coefficients of Contaminated Sediments", Environ. Sci. Technol.,2004, 38, 240-247.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ANALYTICAL SUMMARY REPORT

February 27, 2018

Homestake Mining Co
2393 Salt Creek Hwy
Casper, WY 82602-0247

Work Order: B18020067

Project Name: Grants Reclamation Project

Energy Laboratories Inc Billings MT received the following 2 samples for Homestake Mining Co on 2/1/2018 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B18020067-001	C18010792-001B	01/25/18 16:05	02/01/18	Soil	Metals by ICP/ICPMS, Total or Soluble Metals by ICP/ICPMS, SPLP Moisture Percent Moisture Digestion, Total Metals SPLP Extraction, Regular Digestion, Total Metals
B18020067-002	C18010792-002B	01/25/18 17:10	02/01/18	Soil	Metals by ICP/ICPMS, Total or Soluble Metals by ICP/ICPMS, SPLP Moisture Percent Moisture Digestion, Total Metals SPLP Extraction, Regular Digestion, Total Metals

Report Approved By:

ED_004985_00011411-00316

CLIENT: Homestake Mining Co
Project: Grants Reclamation Project
Work Order: B18020067

Report Date: 02/27/18

CASE NARRATIVE

Per client request, results reported as "Metals, SPLP Extractable" were extracted per SW-846 1312 method using dilute bicarbonate/carbonate solution @ pH 9.4 and solid to liquid ratio of 50g/L as described in "Methods for Estimating Adsorbed Uranium (VI) and Distribution Coefficients of Contaminated Sediments", Environ. Sci. Technol.,2004, 38, 240-247.

NARRATIVE BELOW IS FOR Level IV DATA PACKAGE VALIDATION REPORT ONLY

The results and QC summary report provided in detailed format, and provided as a "preliminary" report in the raw data package and is for data validation purposes only for ELI-Billings report B18020067. The results provided in this report are limited to those parameters subcontracted to and analyzed by the ELI Billings Branch Laboratory for ELI Casper laboratory Workorder C18010792 and with corresponding individual lab numbers.

Included with the analysis reports are instrument data reports for all analysis associated with the instrument calibration, QC sample analysis, and sample analysis. Copies of the detailed laboratory records for the analyses are sorted by method, instrument, and then analysis time. All analytical data is within method QA/QC specifications except as noted on analyses and/or QC summary reports, or in this narrative. The analytical report identifies which QC batch ID and sequence QC is associated with each analysis result for a sample.

Inclusion of the raw data will be found on the attached files. The results of this Analytical Report relate only to the items submitted for analysis. Only the raw data associated with parameters listed on this report should be validated.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Client Sample ID: C18010792-001
Project: Grants Reclamation Project
Matrix: Soil

Lab ID: B18020067-001
Collection Date: 01/25/18 16:05
DateReceived: 02/01/18
Report Date: 02/27/18

Analyses	Result	Units	QUAL	RL	MCL	Method	Analysis Date / By	Prep Date	Prep Method	RunID	Run Order	BatchID
PHYSICAL CHARACTERISTICS												
Moisture	2.7	wt%		0.2		D2974	02/02/18 14:00 / ptz			BAL HZW1_180205A : 7		R294214
METALS, SPLP EXTRACTABLE												
Molybdenum	0.002	mg/L		0.001		SW6020	02/14/18 14:08 / jpv	02/12/18 08:13	SW3010	ICPMS202-B_180214A : 51		118409
Selenium	ND	mg/L		0.001		SW6020	02/14/18 14:08 / jpv	02/12/18 08:13	SW3010	ICPMS202-B_180214A : 51		118409
Uranium	0.0018	mg/L		0.0003		SW6020	02/14/18 14:08 / jpv	02/12/18 08:13	SW3010	ICPMS202-B_180214A : 51		118409
Vanadium	0.07	mg/L		0.01		SW6020	02/14/18 14:08 / jpv	02/12/18 08:13	SW3010	ICPMS202-B_180214A : 51		118409
Results reported as "Metals, SPLP Extractable" were extracted per SW-846 1312 method using dilute bicarbonate/carbonate solution @ pH 9.4, and solid to liquid ratio of 50g/L as described in "Methods for Estimating Adsorbed Uranium (VI) and Distribution Coefficients of Contaminated Sediments", Environ. Sci. Technol.,2004, 38, 240-247.												
METALS, TOTAL - EPA SW846												
Aluminum	3150	mg/kg-dry	D	10		SW6010B	02/06/18 15:56 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A : 84		118169
Calcium	954	mg/kg-dry	D	30		SW6010B	02/06/18 15:56 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A : 84		118169
Iron	4530	mg/kg-dry	D	10		SW6010B	02/06/18 15:56 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A : 84		118169
Molybdenum	ND	mg/kg-dry		1		SW6020	02/06/18 18:14 / jpv	02/05/18 07:56	SW3050 B	ICPMS202-B_180206A : 83		118169
Phosphorus	69	mg/kg-dry	D	20		SW6010B	02/06/18 15:56 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A : 84		118169
Potassium	487	mg/kg-dry	D	50		SW6010B	02/06/18 15:56 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A : 84		118169
Selenium	ND	mg/kg-dry		1		SW6020	02/06/18 18:14 / jpv	02/05/18 07:56	SW3050 B	ICPMS202-B_180206A : 83		118169
Sodium	54	mg/kg-dry	D	30		SW6010B	02/06/18 15:56 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A : 84		118169
Uranium	ND	mg/kg-dry		1		SW6020	02/06/18 18:14 / jpv	02/05/18 07:56	SW3050 B	ICPMS202-B_180206A : 83		118169
Vanadium	7	mg/kg-dry		1		SW6020	02/06/18 18:14 / jpv	02/05/18 07:56	SW3050 B	ICPMS202-B_180206A : 83		118169

Report Definitions: RL - Analyte reporting limit. MCL - Maximum contaminant level. ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

PRELIMINARY

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Homestake Mining Co
Client Sample ID: C18010792-002
Project: Grants Reclamation Project
Matrix: Soil

Lab ID: B18020067-002
Collection Date: 01/25/18 17:10
DateReceived: 02/01/18
Report Date: 02/27/18

Analyses	Result	Units	QUAL	RL	MCL	Method	Analysis Date / By	Prep Date	Prep Method	RunID	Run Order	BatchID
PHYSICAL CHARACTERISTICS												
Moisture	9.6	wt%		0.2		D2974	02/02/18 14:00 / ptz			BAL HZW1_180205A	10	R294214
METALS, SPLP EXTRACTABLE												
Molybdenum	0.004	mg/L		0.001		SW6020	02/14/18 14:14 / jpv	02/12/18 08:13	SW3010	ICPMS202-B_180214A	53	118409
Selenium	ND	mg/L		0.001		SW6020	02/14/18 14:14 / jpv	02/12/18 08:13	SW3010	ICPMS202-B_180214A	53	118409
Uranium	0.0059	mg/L		0.0003		SW6020	02/14/18 14:14 / jpv	02/12/18 08:13	SW3010	ICPMS202-B_180214A	53	118409
Vanadium	0.06	mg/L		0.01		SW6020	02/14/18 14:14 / jpv	02/12/18 08:13	SW3010	ICPMS202-B_180214A	53	118409
Results reported as "Metals, SPLP Extractable" were extracted per SW-846 1312 method using dilute bicarbonate/carbonate solution @ pH 9.4, and solid to liquid ratio of 50g/L as described in "Methods for Estimating Adsorbed Uranium (VI) and Distribution Coefficients of Contaminated Sediments", Environ. Sci. Technol.,2004, 38, 240-247.												
METALS, TOTAL - EPA SW846												
Aluminum	1970	mg/kg-dry	D	10		SW6010B	02/06/18 16:00 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A	85	118169
Calcium	2400	mg/kg-dry	D	30		SW6010B	02/06/18 16:00 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A	85	118169
Iron	5680	mg/kg-dry	D	10		SW6010B	02/06/18 16:00 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A	85	118169
Molybdenum	ND	mg/kg-dry		1		SW6020	02/06/18 18:17 / jpv	02/05/18 07:56	SW3050 B	ICPMS202-B_180206A	84	118169
Phosphorus	211	mg/kg-dry	D	20		SW6010B	02/06/18 16:00 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A	85	118169
Potassium	339	mg/kg-dry	D	50		SW6010B	02/06/18 16:00 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A	85	118169
Selenium	ND	mg/kg-dry		1		SW6020	02/06/18 18:17 / jpv	02/05/18 07:56	SW3050 B	ICPMS202-B_180206A	84	118169
Sodium	118	mg/kg-dry	D	30		SW6010B	02/06/18 16:00 / slf	02/05/18 07:56	SW3050 B	ICP204-B_180206A	85	118169
Uranium	ND	mg/kg-dry		1		SW6020	02/06/18 18:17 / jpv	02/05/18 07:56	SW3050 B	ICPMS202-B_180206A	84	118169
Vanadium	7	mg/kg-dry		1		SW6020	02/06/18 18:17 / jpv	02/05/18 07:56	SW3050 B	ICPMS202-B_180206A	84	118169

Report Definitions: RL - Analyte reporting limit. MCL - Maximum contaminant level. ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

PRELIMINARY

DATES REPORT

Work Order: B18020067
Client: Energy Laboratories Casper
Project: Grants Reclamation Project

Report Date: 02/27/18

Lab ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date Method Batch	Analysis Date
B18020067-001A	C18010792-001A	1/25/2018 4:05:00 PM	Soil	Metals by ICP/ICPMS, SPLP	02/08/2018	02/12/2018 SW6020 [118409]	2/14/2018
B18020067-001A	C18010792-001A	1/25/2018 4:05:00 PM	Soil	Metals by ICP/ICPMS, SPLP	02/08/2018	02/12/2018 SW6020 [118409]	2/13/2018
B18020067-001A	C18010792-001A	1/25/2018 4:05:00 PM	Soil	Metals by ICP/ICPMS, SPLP	02/08/2018	02/12/2018 SW6010B [118409]	2/13/2018
B18020067-001B	C18010792-001B	1/25/2018 4:05:00 PM	Soil	Metals by ICP/ICPMS, Total or Soluble		02/05/2018 SW6020 [118169]	2/6/2018
B18020067-001B	C18010792-001B	1/25/2018 4:05:00 PM	Soil	Metals by ICP/ICPMS, Total or Soluble		02/05/2018 SW6010B [118169]	2/6/2018
B18020067-001B	C18010792-001B	1/25/2018 4:05:00 PM	Soil	Moisture		NA	2/2/2018
B18020067-001B	C18010792-001B	1/25/2018 4:05:00 PM	Soil	Percent Moisture		NA	2/2/2018
B18020067-002A	C18010792-002A	1/25/2018 5:10:00 PM	Soil	Metals by ICP/ICPMS, SPLP	02/08/2018	02/12/2018 SW6020 [118409]	2/14/2018
B18020067-002A	C18010792-002A	1/25/2018 5:10:00 PM	Soil	Metals by ICP/ICPMS, SPLP	02/08/2018	02/12/2018 SW6020 [118409]	2/13/2018
B18020067-002A	C18010792-002A	1/25/2018 5:10:00 PM	Soil	Metals by ICP/ICPMS, SPLP	02/08/2018	02/12/2018 SW6010B [118409]	2/13/2018
B18020067-002B	C18010792-002B	1/25/2018 5:10:00 PM	Soil	Metals by ICP/ICPMS, Total or Soluble		02/05/2018 SW6020 [118169]	2/6/2018
B18020067-002B	C18010792-002B	1/25/2018 5:10:00 PM	Soil	Metals by ICP/ICPMS, Total or Soluble		02/05/2018 SW6010B [118169]	2/6/2018
B18020067-002B	C18010792-002B	1/25/2018 5:10:00 PM	Soil	Moisture		NA	2/2/2018
B18020067-002B	C18010792-002B	1/25/2018 5:10:00 PM	Soil	Percent Moisture		NA	2/2/2018

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: 118169

Run ID :Run Order: **ICP204-B_180206A: 82** SampType: **Method Blank** Lab ID: **MB-118169** Method: **SW6010B**

Analysis Date: **02/06/18 15:48** Units: **mg/kg** **Prep Info:** Prep Date: **2/5/2018** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	ND	0.6									
Calcium	5	4									
Iron	ND	2									
Phosphorus	0.9	0.3									
Potassium	3	3									
Sodium	8	2									

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 83** SampType: **Standard Reference Material** Lab ID: **SRM-118169** Method: **SW6010B**

Analysis Date: **02/06/18 15:52** Units: **mg/kg** **Prep Info:** Prep Date: **2/5/2018** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	8630	9.9	8780	0	98	11	189				
Calcium	2910	30	3090	0	94	85	115				
Iron	3860	9.9	4280	0	90	72	128				
Phosphorus	368	20	415	0	89	70	130				
Potassium	2810	50	3080	0	91	80	120				
Sodium	4400	30	4580	0	96	85	115				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 102** SampType: **Serial Dilution** Lab ID: **B18020068-014BDIL** Method: **SW6010B**

Analysis Date: **02/06/18 17:11** Units: **mg/kg-dry** **Prep Info:** Prep Date: **2/5/2018** Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	1760	51		0				1725	2.1	10	
Calcium	13600	150		0				12780	5.9	10	
Iron	4830	51		0				4554	5.8	10	
Phosphorus	179	100		0				174	2.8	10	
Potassium	295	250		0				289.6	2.0	10	
Sodium	95.6	150		0				77.36		10	N

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestead Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: 118169

Run ID :Run Order: **ICP204-B_180206A: 105** SampType: **Post Digestion/Distillation Spike** Lab ID: **B18020068-014BPDS** Method: **SW6010B**

Analysis Date: **02/06/18 17:23** Units: **mg/kg-dry** **Prep Info:** Prep Date: **2/5/2018** Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	1980	10	262.1	1725		75	125				A
Calcium	15000	31	2621	12780		75	125				A
Iron	4550	10	262.1	4554		75	125				A
Phosphorus	677	21	524.2	174	96	75	125				
Potassium	2800	52	2621	289.6	96	75	125				
Sodium	2670	31	2621	77.36	99	75	125				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 106** SampType: **Sample Matrix Spike** Lab ID: **B18020068-014BMS3** Method: **SW6010B**

Analysis Date: **02/06/18 17:27** Units: **mg/kg-dry** **Prep Info:** Prep Date: **2/5/2018** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	3760	10	257.1	1725		75	125				A
Calcium	11900	31	2571	12780		75	125				A
Iron	8250	10	257.1	4554		75	125				A
Phosphorus	655	21	514.2	174	94	75	125				
Potassium	3070	51	2571	289.6	108	75	125				
Sodium	2660	31	2571	77.36	100	75	125				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 107** SampType: **Sample Matrix Spike Duplicate** Lab ID: **B18020068-014BMSD3** Method: **SW6010B**

Analysis Date: **02/06/18 17:31** Units: **mg/kg-dry** **Prep Info:** Prep Date: **2/5/2018** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	4440	10	257	1725		75	125	3764	16	20	A
Calcium	28700	31	2570	12780		75	125	11890	83	20	AR
Iron	5650	10	257	4554		75	125	8250	37	20	AR
Phosphorus	627	21	514	174	88	75	125	655.1	4.3	20	
Potassium	3190	51	2570	289.6	113	75	125	3071	3.9	20	
Sodium	2650	31	2570	77.36	100	75	125	2660	0.4	20	

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: 118169

Run ID :Run Order: **ICPMS202-B_180206A: 82** SampType: **Method Blank** Lab ID: **MB-118169** Method: **SW6020**
Analysis Date: **02/06/18 18:11** Units: **mg/kg** **Prep Info:** Prep Date: **2/5/2018** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.01	0.009									
Selenium	ND	0.04									
Uranium	ND	0.001									
Vanadium	ND	0.2									

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 105** SampType: **Serial Dilution** Lab ID: **B18020068-014BDIL** Method: **SW6020**
Analysis Date: **02/06/18 19:12** Units: **mg/kg-dry** **Prep Info:** Prep Date: **2/5/2018** Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.650	1.0		0				0.8871		10	N
Selenium	ND	1.0		0				0		10	
Uranium	1.25	1.0		0				1.446	15	10	R
Vanadium	6.62	2.1		0				7.288		10	N

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 106** SampType: **Post Digestion/Distillation Spike** Lab ID: **B18020068-014BPDS1** Method: **SW6020**
Analysis Date: **02/06/18 19:15** Units: **mg/kg-dry** **Prep Info:** Prep Date: **2/5/2018** Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	14.6	1.0	12.98	0.8871	106	75	125				
Selenium	12.7	1.0	12.98	0	98	75	125				
Uranium	15.2	1.0	12.98	1.446	106	75	125				
Vanadium	20.8	1.0	12.98	7.288	104	75	125				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 107** SampType: **Standard Reference Material** Lab ID: **SRM-118169** Method: **SW6020**
Analysis Date: **02/06/18 19:18** Units: **mg/kg** **Prep Info:** Prep Date: **2/5/2018** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	58.6	1.0	57.8	0	101	80	120				
Selenium	43.8	1.0	42.4	0	103	79	121				
Uranium	1.36	1.0		0		0	0				
Vanadium	73.9	1.0	72.3	0	102	81	119				

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: 118169

Run ID :Run Order: **ICPMS202-B_180206A: 107** SampType: **Standard Reference Material** Lab ID: **SRM-118169** Method: **SW6020**

Analysis Date: **02/06/18 19:18** Units: **mg/kg** **Prep Info:** Prep Date: **2/5/2018** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 108** SampType: **Sample Matrix Spike** Lab ID: **B18020068-014BMS3** Method: **SW6020**

Analysis Date: **02/06/18 19:20** Units: **mg/kg-dry** **Prep Info:** Prep Date: **2/5/2018** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	54.3	1.0	51.42	0.8871	104	75	125				
Selenium	51.5	1.0	51.42	0	100	75	125				
Uranium	56.8	1.0	51.42	1.446	108	75	125				
Vanadium	68.8	1.0	51.42	7.288	120	75	125				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 109** SampType: **Sample Matrix Spike Duplicate** Lab ID: **B18020068-014BMSD3** Method: **SW6020**

Analysis Date: **02/06/18 19:23** Units: **mg/kg-dry** **Prep Info:** Prep Date: **2/5/2018** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	53.5	1.0	51.4	0.8871	102	75	125	54.26	1.4	20	
Selenium	51.3	1.0	51.4	0	100	75	125	51.53	0.5	20	
Uranium	56.2	1.0	51.4	1.446	106	75	125	56.78	1.1	20	
Vanadium	65.4	1.0	51.4	7.288	113	75	125	68.79	5.1	20	

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestead Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: 118409

Run ID :Run Order: **ICPMS202-B_180214A: 50** SampType: **Method Blank** Lab ID: **MB-118409** Method: **SW6020**

Analysis Date: **02/14/18 14:06** Units: **mg/L** **Prep Info:** Prep Date: **2/12/2018** Prep Method: **SW3010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0009	0.00004									
Selenium	ND	0.0003									
Uranium	ND	0.00002									
Vanadium	ND	0.0007									

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 52** SampType: **Serial Dilution** Lab ID: **C18010792-001ADIL** Method: **SW6020**

Analysis Date: **02/14/18 14:11** Units: **mg/L** **Prep Info:** Prep Date: **2/12/2018** Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	ND	0.0010		0				0.001982		10	
Selenium	ND	0.0025		0				0		10	
Uranium	0.000910	0.00030		0				0.00183		10	N
Vanadium	0.0607	0.010		0				0.06726		10	N

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 54** SampType: **Laboratory Control Sample** Lab ID: **LCS-118409** Method: **SW6020**

Analysis Date: **02/14/18 14:16** Units: **mg/L** **Prep Info:** Prep Date: **2/12/2018** Prep Method: **SW3010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.553	0.0010	0.5	0.000851	111	80	120				
Selenium	0.402	0.0010	0.5	0	80	80	120				
Uranium	0.540	0.00030	0.5	0	108	80	120				
Vanadium	0.551	0.010	0.5	0	110	80	120				

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 58** SampType: **Laboratory Control Sample Duplicate** Lab ID: **LCSD-118409** Method: **SW6020**

Analysis Date: **02/14/18 14:26** Units: **mg/L** **Prep Info:** Prep Date: **2/12/2018** Prep Method: **SW3010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.567	0.0010	0.5	0.000851	113	80	120	0.5535	2.4	20	
Selenium	0.404	0.0010	0.5	0	81	80	120	0.4016	0.6	20	
Uranium	0.543	0.00030	0.5	0	109	80	120	0.5395	0.6	20	
Vanadium	0.560	0.010	0.5	0	112	80	120	0.5513	1.6	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: 118409

Run ID :Run Order: **ICPMS202-B_180214A: 58** SampType: **Laboratory Control Sample Duplicate** Lab ID: **LCSD-118409** Method: **SW6020**

Analysis Date: **02/14/18 14:26** Units: **mg/L** **Prep Info:** Prep Date: **2/12/2018** Prep Method: **SW3010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 59** SampType: **Sample Matrix Spike** Lab ID: **C18010792-001AMS3** Method: **SW6020**

Analysis Date: **02/14/18 14:29** Units: **mg/L** **Prep Info:** Prep Date: **2/12/2018** Prep Method: **SW3010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	1.10	0.0010	1	0.001982	110	75	125				
Selenium	0.800	0.0010	1	0	80	75	125				
Uranium	1.08	0.00030	1	0.00183	108	75	125				
Vanadium	1.17	0.010	1	0.06726	110	75	125				

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 60** SampType: **Sample Matrix Spike** Lab ID: **C18010792-002AMS3** Method: **SW6020**

Analysis Date: **02/14/18 14:31** Units: **mg/L** **Prep Info:** Prep Date: **2/12/2018** Prep Method: **SW3010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	1.11	0.0010	1	0.003748	111	75	125				
Selenium	0.809	0.0010	1	0	81	75	125				
Uranium	1.11	0.00030	1	0.005852	110	75	125				
Vanadium	1.16	0.010	1	0.06278	110	75	125				

Associated samples: **C18010792-001A, C18010792-002A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294214

Run ID :Run Order: **BAL HZW1_180205A: 71** SampType: **Sample Duplicate** Lab ID: **B18020068-018BDUP** Method: **D2974**

Analysis Date: **02/02/18 14:00** Units: **wt%** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Moisture	17.0	0.20		0				15.08	12	30	

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestead Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294307

Run ID :Run Order: **ICP204-B_180206A: 15** SampType: **CRDL Standard for ICP** Lab ID: **LLRV** Method: **SW6010B**

Analysis Date: **02/06/18 11:12** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	0.105	0.10	0.1	0	105	80	120				
Calcium	0.324	1.0	0.3	0	108	80	120				
Iron	0.0308	0.030	0.03	0	103	80	120				
Phosphorus	0.398	0.10	0.4	0	99	80	120				
Potassium	0.537	1.0	0.5	0	107	80	120				
Sodium	0.397	1.0	0.3	0	132	80	120				S

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 17** SampType: **Initial Calibration Verification Standard** Lab ID: **QCS** Method: **SW6010B**

Analysis Date: **02/06/18 11:19** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	3.92	0.10	4	0	98	90	110				
Calcium	40.4	1.0	40	0	101	90	110				
Iron	4.12	0.030	4	0	103	90	110				
Phosphorus	8.12	0.10	8	0	102	90	110				
Potassium	41.5	1.0	40	0	104	90	110				
Sodium	41.4	1.0	40	0	103	90	110				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 18** SampType: **Interference Check Sample A** Lab ID: **ICSA** Method: **SW6010B**

Analysis Date: **02/06/18 11:22** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	498	0.10	500	0	100	80	120				
Calcium	462	1.0	500	0	92	80	120				
Iron	180	0.11	200	0	90	80	120				
Phosphorus	-0.00100	0.10		0							
Potassium	0.0331	1.0		0							
Sodium	0.113	1.0		0							

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294307

Run ID :Run Order: **ICP204-B_180206A: 19** SampType: **Interference Check Sample AB** Lab ID: **ICSAB** Method: **SW6010B**

Analysis Date: **02/06/18 11:27** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	490	0.10	500	0	98	80	120				
Calcium	458	1.0	500	0	92	80	120				
Iron	179	0.11	200	0	89	80	120				
Phosphorus	9.47	0.10	10	0	95	80	120				
Potassium	20.4	1.0	20	0	102	80	120				
Sodium	20.4	1.0	20	0	102	80	120				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 80** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6010B**

Analysis Date: **02/06/18 15:40** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	0.000150	0.10		0		-0.05	0.05				
Calcium	0.00546	1.0		0		-0.1	0.1				
Iron	-0.000680	0.025		0		-0.005	0.005				
Phosphorus	0.00172	0.10		0		-0.05	0.05				
Potassium	0.0165	1.0		0		-0.1	0.1				
Sodium	0.0812	1.0		0		-0.1	0.1				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 91** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6010B**

Analysis Date: **02/06/18 16:25** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	2.57	0.10	2.5	0	103	90	110				
Calcium	26.4	1.0	25	0	105	90	110				
Iron	2.69	0.025	2.5	0	108	90	110				
Phosphorus	2.58	0.10	2.5	0	103	90	110				
Potassium	25.9	1.0	25	0	104	90	110				
Sodium	26.0	1.0	25	0	104	90	110				

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294307

Run ID :Run Order: **ICP204-B_180206A: 92** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6010B**

Analysis Date: **02/06/18 16:29** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	0.00102	0.10		0		-0.05	0.05				
Calcium	0.00581	1.0		0		-0.1	0.1				
Iron	-0.000340	0.025		0		-0.005	0.005				
Phosphorus	0.00228	0.10		0		-0.05	0.05				
Potassium	0.00734	1.0		0		-0.1	0.1				
Sodium	0.0695	1.0		0		-0.1	0.1				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 103** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6010B**

Analysis Date: **02/06/18 17:15** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	2.55	0.10	2.5	0	102	90	110				
Calcium	25.8	1.0	25	0	103	90	110				
Iron	2.71	0.025	2.5	0	109	90	110				
Phosphorus	2.63	0.10	2.5	0	105	90	110				
Potassium	25.6	1.0	25	0	102	90	110				
Sodium	26.3	1.0	25	0	105	90	110				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 104** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6010B**

Analysis Date: **02/06/18 17:19** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	0.00109	0.10		0		-0.05	0.05				
Calcium	0.0132	1.0		0		-0.1	0.1				
Iron	0.00229	0.025		0		-0.005	0.005				
Phosphorus	-0.00151	0.10		0		-0.05	0.05				
Potassium	0.00198	1.0		0		-0.1	0.1				
Sodium	0.0844	1.0		0		-0.1	0.1				

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294307

Run ID :Run Order: **ICP204-B_180206A: 115** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6010B**

Analysis Date: **02/06/18 18:03** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	2.58	0.10	2.5	0	103	90	110				
Calcium	25.9	1.0	25	0	104	90	110				
Iron	2.77	0.025	2.5	0	111	90	110				S
Phosphorus	2.68	0.10	2.5	0	107	90	110				
Potassium	25.9	1.0	25	0	104	90	110				
Sodium	26.9	1.0	25	0	107	90	110				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICP204-B_180206A: 116** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6010B**

Analysis Date: **02/06/18 18:07** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	0.000600	0.10		0		-0.05	0.05				
Calcium	0.00769	1.0		0		-0.1	0.1				
Iron	0.000620	0.025		0		-0.005	0.005				
Phosphorus	-0.000390	0.10		0		-0.05	0.05				
Potassium	-0.0101	1.0		0		-0.1	0.1				
Sodium	0.0745	1.0		0		-0.1	0.1				

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294337

Run ID :Run Order: **ICPMS202-B_180206A: 27** SampType: **Initial Calibration Verification Standard** Lab ID: **QCS** Method: **SW6020**

Analysis Date: **02/06/18 15:14** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0478	0.0010	0.05	0	96	90	110				
Selenium	0.0501	0.0010	0.05	0	100	90	110				
Uranium	0.0199	0.00030	0.02	0	100	90	110				
Vanadium	0.0491	0.0010	0.05	0	98	90	110				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 29** SampType: **CRDL Standard for ICP** Lab ID: **LLRV** Method: **SW6020**

Analysis Date: **02/06/18 15:27** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.000339	0.0010	0.0005	0	68	80	120				S
Selenium	0.00196	0.0010	0.002	0	98	80	120				
Uranium	0.000389	0.00030	0.0005	0	78	80	120				S
Vanadium	0.00185	0.0010	0.002	0	92	80	120				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 31** SampType: **Interference Check Sample A** Lab ID: **ICSA** Method: **SW6020**

Analysis Date: **02/06/18 15:35** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.821	0.0010	0.8	0	103	70	130				
Selenium	-0.000130	0.0010		0							
Uranium	-0.0000900	0.00030		0							
Vanadium	0.0000600	0.0010		0							

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 32** SampType: **Interference Check Sample AB** Lab ID: **ICSAB** Method: **SW6020**

Analysis Date: **02/06/18 15:38** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.812	0.0010	0.8	0	102	70	130				
Selenium	0.00904	0.0010	0.01	0	90	70	130				
Uranium	-0.0000900	0.00030		0							
Vanadium	0.0191	0.0010	0.02	0	96	70	130				

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294337

Run ID :Run Order: **ICPMS202-B_180206A: 32** SampType: **Interference Check Sample AB** Lab ID: **ICSAB** Method: **SW6020**

Analysis Date: **02/06/18 15:38** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 75** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/06/18 17:53** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0511	0.0050	0.05	0	102	90	110				
Selenium	0.0522	0.0050	0.05	0	104	90	110				
Uranium	0.0517	0.0010	0.05	0	103	90	110				
Vanadium	0.0522	0.10	0.05	0	104	90	110				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 77** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **02/06/18 17:58** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	-0.0000570	0.0050		0							
Selenium	-0.0000600	0.0050		0							
Uranium	-0.000105	0.0010		0							
Vanadium	0.0000790	0.10		0							

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 88** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/06/18 18:27** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0513	0.0050	0.05	0	103	90	110				
Selenium	0.0515	0.0050	0.05	0	103	90	110				
Uranium	0.0520	0.0010	0.05	0	104	90	110				
Vanadium	0.0527	0.10	0.05	0	105	90	110				

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294337

Run ID :Run Order: **ICPMS202-B_180206A: 90** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **02/06/18 18:32** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	-0.000122	0.0050		0							
Selenium	-0.000188	0.0050		0							
Uranium	-0.000104	0.0010		0							
Vanadium	-0.0000340	0.10		0							

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 101** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/06/18 19:02** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0502	0.0050	0.05	0	100	90	110				
Selenium	0.0509	0.0050	0.05	0	102	90	110				
Uranium	0.0520	0.0010	0.05	0	104	90	110				
Vanadium	0.0514	0.10	0.05	0	103	90	110				

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 103** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **02/06/18 19:07** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	-0.000154	0.0050		0							
Selenium	-0.000193	0.0050		0							
Uranium	-0.000112	0.0010		0							
Vanadium	-0.0000720	0.10		0							

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 114** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/06/18 19:36** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0508	0.0050	0.05	0	102	90	110				
Selenium	0.0526	0.0050	0.05	0	105	90	110				
Uranium	0.0508	0.0010	0.05	0	101	90	110				
Vanadium	0.0519	0.10	0.05	0	104	90	110				

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294337

Run ID :Run Order: **ICPMS202-B_180206A: 114** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/06/18 19:36** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Associated samples: **C18010792-001B, C18010792-002B**

Run ID :Run Order: **ICPMS202-B_180206A: 116** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **02/06/18 19:41** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	-0.0000900	0.0050		0							
Selenium	0.0000240	0.0050		0							
Uranium	-0.0000970	0.0010		0							
Vanadium	-0.0000210	0.10		0							

Associated samples: **C18010792-001B, C18010792-002B**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294811

Run ID :Run Order: **ICPMS202-B_180214A: 26** SampType: **Initial Calibration Verification Standard** Lab ID: **QCS** Method: **SW6020**

Analysis Date: **02/14/18 12:31** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0478	0.0010	0.05	0	96	90	110				
Selenium	0.0525	0.0010	0.05	0	105	90	110				
Uranium	0.0196	0.00030	0.02	0	98	90	110				
Vanadium	0.0495	0.0010	0.05	0	99	90	110				

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 28** SampType: **CRDL Standard for ICP** Lab ID: **LLRV** Method: **SW6020**

Analysis Date: **02/14/18 12:44** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.000407	0.0010	0.0005	0	81	80	120				
Selenium	0.00171	0.0010	0.002	0	85	80	120				
Uranium	0.000408	0.00030	0.0005	0	82	80	120				
Vanadium	0.00195	0.0010	0.002	0	98	80	120				

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 30** SampType: **Interference Check Sample A** Lab ID: **ICSA** Method: **SW6020**

Analysis Date: **02/14/18 12:52** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.822	0.0010	0.8	0	103	70	130				
Selenium	-0.0000100	0.0010		0							
Uranium	-0.0000700	0.00030		0							
Vanadium	0.0000900	0.0010		0							

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 31** SampType: **Interference Check Sample AB** Lab ID: **ICSAB** Method: **SW6020**

Analysis Date: **02/14/18 12:55** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.845	0.0010	0.8	0	106	70	130				
Selenium	0.00949	0.0010	0.01	0	95	70	130				
Uranium	-0.0000900	0.00030		0							
Vanadium	0.0207	0.0010	0.02	0	103	70	130				

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294811

Run ID :Run Order: **ICPMS202-B_180214A: 31** SampType: **Interference Check Sample AB** Lab ID: **ICSAB** Method: **SW6020**

Analysis Date: **02/14/18 12:55** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 42** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/14/18 13:44** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0489	0.0050	0.05	0	98	90	110				
Selenium	0.0493	0.0050	0.05	0	99	90	110				
Uranium	0.0491	0.0010	0.05	0	98	90	110				
Vanadium	0.0495	0.10	0.05	0	99	90	110				

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 44** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **02/14/18 13:50** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0000340	0.0050		0							
Selenium	-0.000162	0.0050		0							
Uranium	0.0000950	0.0010		0							
Vanadium	-0.0000680	0.10		0							

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 55** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/14/18 14:19** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0513	0.0050	0.05	0	103	90	110				
Selenium	0.0512	0.0050	0.05	0	102	90	110				
Uranium	0.0496	0.0010	0.05	0	99	90	110				
Vanadium	0.0526	0.10	0.05	0	105	90	110				

Associated samples: **C18010792-001A, C18010792-002A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestead Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294811

Run ID :Run Order: **ICPMS202-B_180214A: 57** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **02/14/18 14:24** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.000181	0.0050		0							
Selenium	-0.0000300	0.0050		0							
Uranium	0.0000340	0.0010		0							
Vanadium	0.0000790	0.10		0							

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 63** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/14/18 14:39** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0523	0.0050	0.05	0	105	90	110				
Selenium	0.0517	0.0050	0.05	0	103	90	110				
Uranium	0.0490	0.0010	0.05	0	98	90	110				
Vanadium	0.0526	0.10	0.05	0	105	90	110				

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 65** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **02/14/18 14:45** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.000175	0.0050		0							
Selenium	-0.0000220	0.0050		0							
Uranium	0.0000460	0.0010		0							
Vanadium	0.0000800	0.10		0							

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 76** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/14/18 15:14** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0488	0.0050	0.05	0	98	90	110				
Selenium	0.0499	0.0050	0.05	0	100	90	110				
Uranium	0.0481	0.0010	0.05	0	96	90	110				
Vanadium	0.0515	0.10	0.05	0	103	90	110				

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Client: Homestake Mining Co
Work Order: C18010792
Project: Grants Reclamation Project

ANALYTICAL QC SUMMARY REPORT

Prepared by Billings, MT Branch

Date: *27-Feb-18*

BatchID: R294811

Run ID :Run Order: **ICPMS202-B_180214A: 76** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/14/18 15:14** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 78** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **02/14/18 15:19** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	-2.00E-06	0.0050		0							
Selenium	0.0000100	0.0050		0							
Uranium	-0.0000940	0.0010		0							
Vanadium	8.00E-06	0.10		0							

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 89** SampType: **Continuing Calibration Verification Standar** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **02/14/18 15:48** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	0.0494	0.0050	0.05	0	99	90	110				
Selenium	0.0504	0.0050	0.05	0	101	90	110				
Uranium	0.0488	0.0010	0.05	0	98	90	110				
Vanadium	0.0522	0.10	0.05	0	104	90	110				

Associated samples: **C18010792-001A, C18010792-002A**

Run ID :Run Order: **ICPMS202-B_180214A: 91** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **02/14/18 15:53** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	-0.0000170	0.0050		0							
Selenium	0.0000850	0.0050		0							
Uranium	-0.0000940	0.0010		0							
Vanadium	-9.00E-06	0.10		0							

Associated samples: **C18010792-001A, C18010792-002A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Work Order Receipt Checklist

Energy Laboratories Casper

B18020067

Login completed by: Leslie S. Cadreau
Date Received: 2/1/2018

Reviewed by: Leslie S Cadreau
Received by: qej

Reviewed Date: 2/1/2018
Carrier name: Courier

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

The temperature of the sample(s) for shipping container 1 was 4.2°C, shipping container 2 was 2.4°C, shipping container 3 was 5.6°C and shipping container 4 was 5.2°C.

Group COC Receipt Acknowledgement

Remote WO	Local WO	Received By	Carrier	Temp	Method	Blank	HeadSpace	PH	Comments
C18010792	B18020067	Quincee Jones	Courier		On Ice	No	N/A	N/A	The temperature of the sample(s) for shipping container 1 was 4.2°C, shipping container 2 was 2.4°C, shipping container 3 was 5.6°C and shipping container 4 was 5.2°C.

Signed Leslie Cadman

Date 02/1/18

Time 11:20

Page 1 of 1

Energy Laboratories, Inc.
2393 Salt Creek Hwy * PO Box 247
Casper, WY 82602-0247
307.235.0515

C18010792

CHAIN-OF-CUSTODY RECORD

Custody Seal: Y N
Intact: Y N
Signature Match: Y N

Shipped By: _____
Receipt Temp: _____

Subcontractor:
ELI - Billings
1120 S. 27th St.
Billings, MT 59101
TEL: (406) 252-6325 FAX: (406) 252-6069
Acct #:

Subcontractor's Client: Homestake Mining Co

Rush	Sample ID	Matrix	Collection Date	Bottle Type	Requested Tests: 6010_20-S	6010_20-SPLP	SPLP-EXT-REG	SPLP-PRP-3010
☐	C18010792-001A	Soil	01/25/18 04:05 P	1-1L-CG-WM		1	1	1
☐	C18010792-001B	Soil	01/25/18 04:05 P	1-8OZ-CG-WM	1			
☐	C18010792-002A	Soil	01/25/18 05:10 P	1-1L-CG-WM		1	1	1
☐	C18010792-002B	Soil	01/25/18 05:10 P	1-8OZ-CG-WM	1			

Earliest Due Date: 2/21/2018

Comments:

QC Level:
LVL4

	Date/Time		
Relinquished by:	Denise Dias 1/31/18 808	**Received by:**	
Relinquished by:		**Received by:**	

ED_004985_00011411-00342

ED 004985 00011411-00343

Environ. Sci. Technol. 2004, 38, 240−247

Methods for Estimating Adsorbed Uranium(VI) and Distribution Coefficients of Contaminated Sediments

MATTHIAS KOHLER,*,† GARY P. CURTIS,‡ DAVID E. MEECE,‡ AND JAMES A. DAVIS‡

Environmental Science and Engineering Division, Colorado School of Mines, Golden, Colorado 80401, and U.S. Geological Survey, Menlo Park, California 94025

Assessing the quantity of U(VI) that participates in sorption/desorption processes in a contaminated aquifer is an important task when investigating U migration behavior. U-contaminated aquifer sediments were obtained from 16 different locations at a former U mill tailings site at Naturita, CO (U.S.A.) and were extracted with an artificial groundwater, a high pH sodium bicarbonate solution, hydroxylamine hydrochloride solution, and concentrated nitric acid. With an isotopic exchange method, both a K_D value for the specific experimental conditions as well as the total exchangeable mass of U(VI) was determined. Except for one sample, K_D values determined by isotopic exchange with U-contaminated sediments that were in equilibrium with atmospheric CO_2 agreed within a factor of 2 with K_D values predicted from a nonelectrostatic surface complexation model (NEM) developed from U(VI) adsorption experiments with uncontaminated sediments. The labile fraction of U(VI) and U extracted by the bicarbonate solution were highly correlated ($r^2 = 0.997$), with a slope of 0.96 ± 0.01. The proximity of the slope to one suggests that both methods likely access the same reservoir of U(VI) associated with the sediments. The results indicate that the bicarbonate extraction method is useful for estimating the mass of labile U(VI) in sediments that do not contain U(IV). In-situ K_D values calculated from the measured labile U(VI) and the dissolved U(VI) in the Naturita alluvial aquifer agreed within a factor of 3 with in-situ K_D values predicted with the NEM and groundwater chemistry at each well.

Introduction

A critical aspect of risk assessment and remediation studies at many uranium-contaminated sites is estimating the migration of U(VI) in groundwaters (e.g. refs *1*−*3*). In model simulations, retardation of U(VI) is often estimated based on a distribution coefficient, K_D, or a range of K_D values that is meant to describe the partitioning of U(VI) between the solid and aqueous phases. The distribution coefficient, K_D, is defined by the concentration of sorbed U divided by the concentration of dissolved U, regardless of the solid and solution compositions. In practice, K_D values are generally chosen based on laboratory batch experiments with materials from contaminated sites, single mineral phases, mineral mixtures, crushed rock materials, or on studies/observations at other U-contaminated sites. A significant problem is that many batch experiments performed in the laboratory for K_D values are equilibrated in air and thus do not account for the fact that the partial pressures of carbon dioxide gas are generally greater in aquifers and may undergo seasonal variations (*4*, *5*). K_D values, especially those for U(VI), are dependent on the geochemistry of an aquifer, which can vary temporally and spatially. U(VI) is relatively weakly adsorbed compared to many metal contaminants, and it forms strong aqueous complexes with carbonate.

Numerous batch adsorption studies on natural and synthetic materials have demonstrated the dependence of U(VI) adsorption on pH and carbonate (and other ligands) concentrations in aqueous solutions (*6*−*12*), and variability in K_D values has been the subject of several studies (*8*, *10*, *13*−*18*). Simulations with a constant K_D can, therefore, introduce considerable uncertainty into risk assessment or evaluation of remediation alternatives. Methods are needed to estimate K_D values in the field ("in-situ") for validation of surface complexation models (SCM) to be used in risk assessment transport models and to constrain the initial conditions in transport modeling.

Lienert et al. (*4*) pointed out that great care should be taken when laboratory K_D values are used to estimate in-situ K_D's. Based on the retarded appearance of a uranium pulse in a well at a distance of 5 m from a river they estimated a K_D of (7 ± 2.5) mL/g. They emphasized that their value was in general much smaller than K_D's obtained in laboratory experiments on mineralogical constituents of the aquifer material (quartz, calcite, K-feldspars, illite, and chlorite).

Over the last two decades many researchers have pointed out the limitations and/or inadequacies of a constant K_D approach for transport modeling (*19*−*21*). More recent transport simulations take advantage of multicomponent reactive transport models, which can account for variable chemical speciation (e.g. refs *22*−*25*). SCMs have provided an approach to describe adsorption processes (through well-defined stoichiometric reactions of surface and aqueous species) rather than the mere distribution between aqueous and solid phases (*26*). This process-oriented approach to adsorption and transport modeling better reflects the dynamic behavior of a complex aquifer system (*27*−*29*). Thus, in addition to hydrogeological parameters, a detailed knowledge of geochemical conditions at a contaminated site is required to make accurate transport simulations in groundwater.

An important initial condition that must be specified for U(VI) transport simulations at U-contaminated sites is the mass and oxidation state of U associated with the contaminated sediments. Several experimental studies have been conducted to evaluate the extent to which U(VI) is associated with natural soils (e.g. ref *30*). Payne and Waite (*31*) showed that exchangeable U of rock samples determined by isotope exchange techniques was comparable to the amount of U extracted by Tamm's acid oxalate (TAO) and determined in-situ K_D values at the Koongarra U deposit in Northern Australia. Mason et al. (*32*) found that a 0.5 M sodium bicarbonate solution was an efficient extractant for U-contaminated soils from the Fernald Environmental Management Project (FEMP). The amount of dissolved U corresponded approximately to the amount of U(VI) present

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† Colorado School of Mines.
‡ U.S. Geological Survey.

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ED 004985 00011411-00344

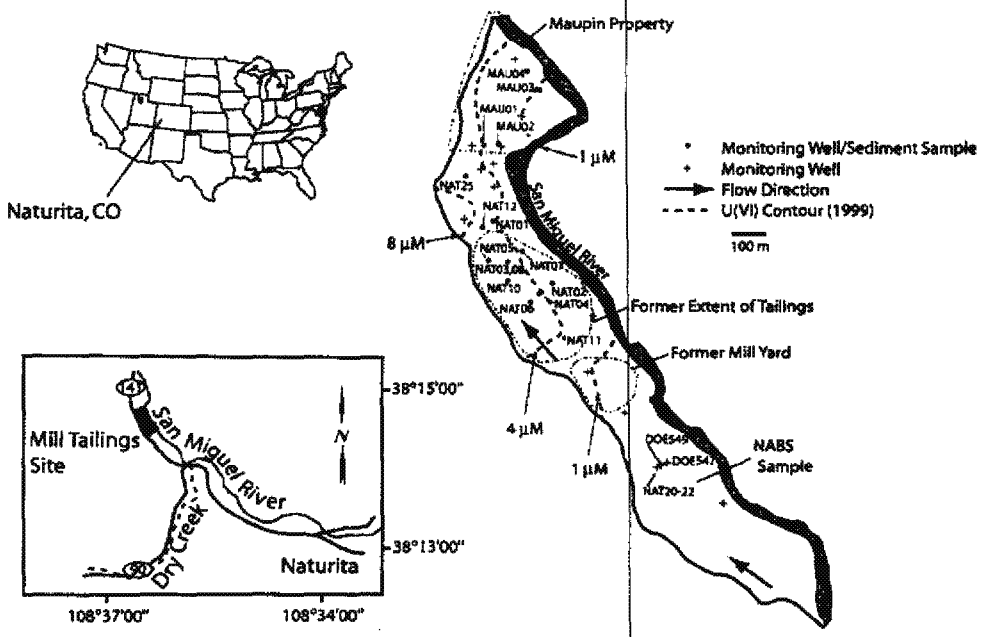

FIGURE 1. Locality map of Naturita, Colorado, U.S.A.

in the soil. Gadelle et al. (*33*) tested the efficiency of surfactants and bicarbonate (among other extractants) for the extraction of U(VI) adsorbed under laboratory conditions onto Oak Ridge soils. Bicarbonate was as efficient as the surfactants as long as the pH of the extracting solutions remained high.

None of the studies above was focused on developing experimental methods for quantifying initial adsorbed U(VI) for reactive solute transport modeling. The overall objective of this study is to evaluate various methods to determine the labile fraction of U(VI) sorbed on U-contaminated sediments collected at the Naturita Uranium Mill Tailings Remediation Act (UMTRA) site (a list of abbreviations is given in the Supporting Information). Specific objectives are as follows: (1) to assess total exchangeable U by isotopic exchange and to compare the results to the quantities of U extracted from the contaminated sediments by various extractants in order to determine if any of the extraction methods provide a good estimate for sorbed U(VI) on the U-contaminated sediments and (2) to estimate in-situ K_D values for the sediments and compare them with K_D values obtained from a surface complexation model developed to describe U(VI) adsorption by uncontaminated sediments from the Naturita site.

Methods and Materials

The Naturita Field Site. The Naturita UMTRA site is located in southwestern Colorado in Montrose County, about 3 km northwest of the town of Naturita, and on the west bank of the San Miguel River (Figure 1). At the Naturita site uranium-(U) and vanadium(V) ores were processed at the site between 1939 and the early 1980s (*34*). Stockpiled tailings were removed from the Naturita site in 1979. Surface remediation of the site began in 1994 and was completed in 1998 (*35*). U and V were extracted from the ores by salt roasting, followed by carbonate leaching in percolation tanks. Carbonate leach residues were then sent to a second stage of sulfuric acid percolation leaching. Leach tails were slurried onto the land surface at the site, in an area downgradient of the mill yard between State Highway 141 and the river. The climate of the area is semiarid; annual precipitation is approximately 33 cm. Off-site disposal of U–V tailings from the site was completed during 1977–1979. Contaminated soils and vadose zone materials were removed from the site between 1996 and 1998, and the excavated areas were filled in with clean backfill. U(VI) contamination in groundwater at the site has been observed primarily within an unconfined, shallow alluvial aquifer composed of sand, gravel, pebbles, and cobbles. The San Miguel River recharges the aquifer. The saturated thickness of the alluvial aquifer is about 3–4 m.

Materials. Experiments were conducted on 16 samples collected from U-contaminated alluvial sediments and with a sample of uncontaminated sediments from the aquifer (referred to as Naturita Aquifer Background Sediment or NABS). The NABS sample was collected in July 1998, using a backhoe to collect sediments from beneath the water table in an area upgradient of wells DOE-547 and NAT-20, -21, and -22 (Figure 1). Cobbles (>64 mm) were removed with a coarse mesh in the field. A total of 734 kg of wet material was placed in sealed plastic buckets and transferred to the laboratory for detailed processing and characterization. U-contaminated sediments were collected from auger flights during the installation of monitoring wells in October 1998 or with a hand auger at a few selected locations during 2000–2001. Sample NAT-25B was collected in September 2000 with a hand auger at a location about 2 m from the monitoring well NAT-25. The collected sediments were drained and collected into sealed plastic buckets. The sediments were air-dried in the laboratory, dry sieved through 3 mm nylon mesh, and stored at 4 °C in the dark. Sample NAT-25J was collected in September 2001 with a hand auger at a location about 3 m from NAT-25 and 4 m from site NAT-25B. Sample NAT-25J was neither air-dried nor sieved and was used immediately in glovebag experiments in the field as described below. All other experiments described in this study were carried out with the air-dried <3 mm fractions.

K_D Determinations. K_D is calculated from

$$K_D = 1000 \cdot \frac{C_s}{C} \qquad (1)$$

where C_s is the concentration of sorbed U(VI) on the sediment in mol/g, C is the concentration of total dissolved U(VI) in M (mol/L), and K_D is commonly given in units of mL/g (the

factor 1000 in eq 1 accounts for the conversion of liters into milliliters). In this work two different methods were used to determine the concentration of sorbed U(VI): (1) an extraction of the sediments with a bicarbonate solution and (2) an isotope exchange technique. Both methods are described below. For the concentration of the total dissolved U(VI), actual values of the groundwater were used.

Methods. Analytical methods such as kinetic phosphorescence analysis (KPA) for U(VI); Fe, V, Mn, and Ca analysis by inductively coupled argon plasma atomic emission spectrometry (ICP-AES); alpha activity of ^{233}U by liquid scintillation counting (LSC); and alkalinities and measurements of dissolved oxygen and Fe(II) in the field are given in the Supporting Information and in ref *11*. BET surface areas of the samples were measured on a Tristar Micromeritics system and are given in Table S4 of the Supporting Information. The presence of the major mineralogical components quartz, feldspars, calcite, and layer silicates in NABS was confirmed by XRD. A detailed mineralogical characterization is given in ref *11*.

Four different media were used for the extraction of the sediments. A hot concentrated nitric acid extraction, a 50 °C hydroxylamine hydrochloride (HA·HCl) extraction, an extraction in dilute bicarbonate/carbonate solution at pH 9.4 (CARB), and a desorption/extraction in the artificial groundwater followed by isotopic exchange in the same medium were conducted. All the methods are described elsewhere (*11*). This work focuses on the extractions with bicarbonate solution (CARB) and artificial groundwater followed by isotopic exchange, and the methods are outlined below.

Sodium (Bi)carbonate Extractions. The sodium bicarbonate/carbonate solution (CARB) used as an extractant was $1.44 \cdot 10^{-2}$ M in $NaHCO_3$ and $2.8 \cdot 10^{-3}$ M in Na_2CO_3. Its calculated ionic strength was 0.022 M, with a measured pH of 9.45 ± 0.05, and its alkalinity was 20 mequiv/L. The solid-to-liquid ratio was 50 g/L. Kinetic data were collected with sampling times ranging from 1 h to 12−14 days. Samples were filtered (0.45 μm) and acidified for U(VI) analysis (KPA) and other metals (ICP-AES).

Artificial Groundwater Extractions. The sediment samples were extracted with an artificial groundwater solution, referred to as AGW-3, which had a composition based on an average groundwater composition for well DOE-549 (Figure 1). To conduct experiments equilibrated with air, the alkalinity (HCO_3^-) of AGW-3 was significantly reduced relative to DOE-549 water. To keep the ionic strength near 0.02 M, $CaCl_2$ was added. The composition of AGW-3 was $NaHCO_3$ $5.38 \cdot 10^{-4}$ M, KCl $6.4 \cdot 10^{-5}$ M, Na_2SO_4 $9.38 \cdot 10^{-4}$ M, $MgSO_4 \cdot 7H_2O$ $1.515 \cdot 10^{-3}$ M, $CaCl_2$ $2.38 \cdot 10^{-3}$ M, and $CaSO_4 \cdot 2H_2O$ $2.33 \cdot 10^{-3}$ M. HYDRAQL (*36*) calculations gave a pH of 7.88 (for a partial pressure of CO_2 of 373 ppm) and showed that the solution was at saturation with calcite (the thermodynamic database for all solution species considered in this study is given in Table S2 of the Supporting Information). Prior to contact with the sediment samples, AGW-3 was first equilibrated with the NABS sediment sample for several days. This preequilibration step was performed to minimize subsequent pH changes during the extractions of the samples. In the course of this preequilibration step, AGW-3 acquired $5.0 \cdot 10^{-9}$ M to $8.4 \cdot 10^{-9}$ M (1.2−2 ppb) dissolved U(VI) from the NABS sample. Samples were filtered (0.45 μm), converted to the nitrate system (see Supporting Information), and acidified for U(VI) analysis (KPA).

Isotopic Exchange Experiments. Isotopic exchange experiments were initiated at the conclusion of the AGW-3 desorption extractions described above by spiking the suspensions with $6-9 \cdot 10^{-9}$ M ^{233}U (0.5−0.75 Bq/mL) as uranyl nitrate. Several supernatant samples were taken during the first week of isotopic exchange, and one sample was taken after 10 months (details are given in ref *11*). The ^{233}U alpha activity in the supernatant was measured for each sample (by LSC), and total dissolved U(VI) was measured twice by KPA during each experiment. Alkalinities were measured at the end of the 10-month period.

The concentration of labile U in each experiment, C_{labile} (M), was calculated by

$$C_{labile} = \frac{A_{System}}{A} \cdot C \qquad (2)$$

where A_{system} is the total ^{233}U activity (Bq/L) in the system, A is the activity of dissolved ^{233}U (Bq/L), and C (M) is the concentration of total dissolved U(VI) measured by KPA. C_{labile} was calculated in each experiment by measuring C and the ^{233}U activity A. A_{System} was calculated from the known initial addition of ^{233}U activity to the experiment. Several corrections (described in detail in the Supporting Information) were made for U introduced as ^{233}U-tracer, U introduced with pretreated AGW-3, and U removed during sampling. C_{labile} (M) can be converted to C^*_{labile} in units of mol/g of solid by multiplying by the liquid/solid ratio, V/w (L/g), in each experiment.

Results

Total U by γ-Spectrometry, Extractions with Nitric Acid, and Hydroxylamine Hydrochloride. The total U content of the samples was quantified by nondestructive measurement of the 63 keV line of ^{234}Th in secular equilibrium with ^{238}U (Figure 2). A value of $9.6 \cdot 10^{-9}$ mol/g U (2.3 ppm) was found for the NABS sample, within the range typical of granitic rocks. All other samples, with the exception of the sample from NAT-11, had significantly higher total U concentrations than the NABS sample. Results of the nitric acid (HNO_3) extractions and hydroxylamine hydrochloride (HA·HCl) extractions are included in Figure 2 for comparison. Linear correlations (Figures S1 and S2) for U determined by γ-spectrometry, HNO_3 and HA·HCl, and a brief discussion are given in the Supporting Information.

Bicarbonate Extractable U − Laboratory. The objective of the bicarbonate extractions was to quantitatively desorb U(VI) from the sediment surfaces by strong aqueous complexation of U(VI) with carbonate with minimal dissolution of the crystalline matrix. Tamm's acid oxalate (TAO (*31*)) would destroy carbonate minerals and was therefore not used in this study. Steady-state concentrations of dissolved U(VI) were achieved after 120 h of extraction with CARB solution (*11*). Extracted U in mol/g is shown in Figure 2. For all samples, during the first 48 h of extraction, the pH and Ca^{2+} concentration in the extracts decreased, indicating that a small amount of calcite was likely precipitated as illustrated in Figure 3 for NAT-06. Except for NAT-06, the pH remained higher than 8.6 throughout the extraction in all samples and speciation calculations with HYDRAQL (*36*) show that the species $UO_2(CO_3)_3^{4-}$, $UO_2(CO_3)_2^{2-}$, $CaUO_2(CO_3)_3^{2-}$, and $Ca_2UO_2(CO_3)_3^0{}_{aq}$ constitute essentially all the dissolved U(VI). (A speciation diagram of U(VI) reflecting a typical species distribution for Naturita field conditions is given in Figure S5 in the Supporting Information and will be discussed below). For sample NAT-06, pH decreased during the extraction from 9.4 to 8.1 in the first 300 h (Figure 3). After 1850 h of extraction, the pH was adjusted from 8.2 back to 9.4. As shown in Figure 3, the pH adjustment had no measurable effect on the concentration of dissolved U(VI). Ca^{2+} decreased because of additional calcite precipitation (note the pH decreased again after the initial pH adjustment upward). Extracted V increased after the adjustment of pH, suggesting that an anionic V species was incompletely desorbed. The fact that extracted U did not change after pH adjustment indicates that U(VI) desorption during the first 120 h of the extraction was complete. Extractions with CARB solution are relatively mild compared to the concentrated

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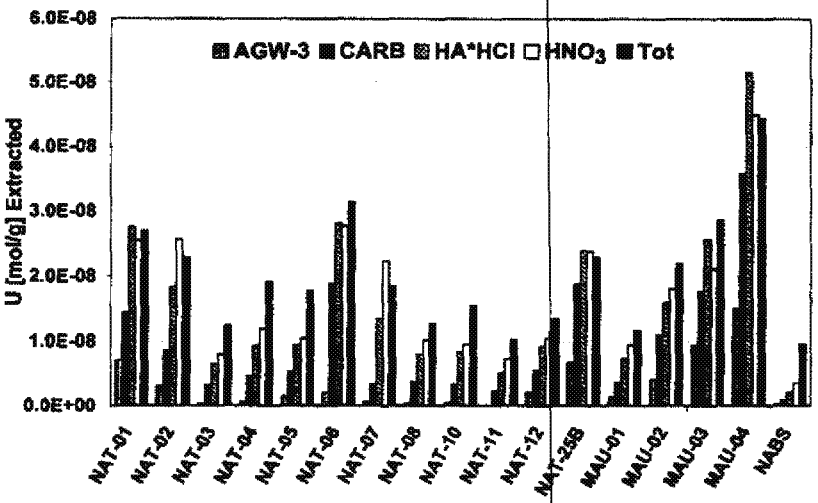

FIGURE 2. Comparison of the amount U extracted (in mol/g) from contaminated sediments and NABS by different extraction methods (artificial groundwater AGW-3, bicarbonate solution CARB, hydroxylamine hydrochloride solution HA·HCl, and concentrated nitric acid HNO_3. Total U content of the sediments determined by γ-spectrometry is given for comparison).

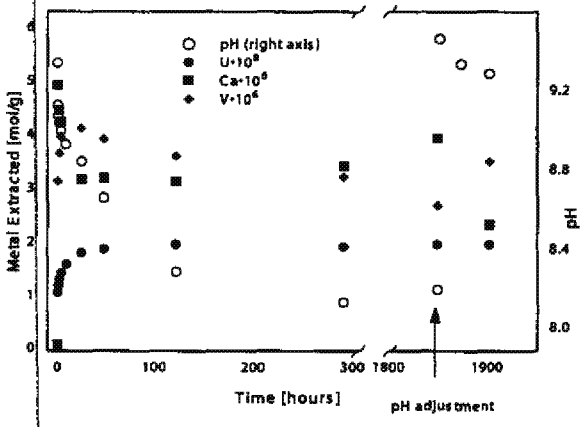

FIGURE 3. Extracted U, V, and Ca from the NAT-06 sediment sample by the CARB solution as a function of extraction time. Readjustment of pH after 1850 h.

nitric and HA·HCl extractions, and CARB was not expected to cause significant dissolution of the mineral matrices.

Bicarbonate Extractable U – Field. An experiment was conducted in the field under oxygen exclusion in order to determine if exposure to air influenced the amount of U being extracted from the sediments by the CARB solution. A subsample of sample NAT-25J was extracted under oxygen exclusion, and the results were compared to CARB extractions of other subsamples after exposure to air in the field and several weeks later in the laboratory. Since the U-contaminated sediments extracted in the laboratory (described above) were air-dried, U(IV) on the sediment surfaces could have been oxidized prior to the extraction. If this occurred, U(VI) extracted by the CARB solution might be interpreted as desorption of U(VI) from the sediments, when in fact the U had been present as U(IV) in the subsurface prior to sampling. By performing the CARB extraction in the field under a nitrogen atmosphere directly after sampling NAT-25J, oxidation of U(IV) would be minimized. U(IV) is highly insoluble, even in the presence of high carbonate concentrations (see the Supporting Information).

The average U(VI) extracted from fresh sediments in the field experiments was $(5.5 \pm 2.6)\cdot10^{-9}$ mol/g and $(4.8 \pm 1.5)\cdot10^{-9}$ mol/g under N_2 and in air atmosphere, respectively. These values compare favorably with the average value of $(4.6 \pm 1.5)\cdot10^{-9}$ mol/g for air-dried sediments (see Table S1 in the Supporting Information). Despite the variability in U extracted, the comparison of extractions under N_2 atmosphere and in air suggest that the U extracted was predominantly present as U(VI) on the NAT-25J sample. However, as this test was only performed on the one sample, the presence of U(IV) in the subsurface cannot be ruled out at other locations in the aquifer.

Artificial Groundwater Extractable U. Dissolved U(VI) concentrations increased rapidly over the first 48–96 h of contact with AGW-3 solution (Figure S3), but the total amount of U extracted was relatively small.

Comparing the values among the four extraction methods (Figure 2), it is clear that the two hot acidic treatments were most efficient in dissolving U from the sediments. However, the CARB extraction was also quite efficient, and for some of the samples, U extracted by the CARB solution approached the values obtained by the acidic treatments (e.g., NAT-06, NAT-25B, MAU-03, and MAU-04). This may be interpreted to mean most of the contaminant U in these samples was present as sorbed U(VI) that could be easily desorbed with the CARB solution. The AGW-3 extractions released the least amount of U. This was expected because the strong mineral acids partly attack the bulk of the minerals, exchange against sorbed U, or dissolve solid U phases. In the CARB solution the carbonate activity is significantly higher than in AGW-3.

Isotopic Exchange Experiments. There were two objectives for the isotope exchange experiments: (1) obtain a K_D value for U(VI) adsorption in suspensions equilibrated with air (in the discussion below, we use only the term, K_D, the distribution coefficient, although equilibrium may not have been achieved in all cases) and (2) quantify the amount of isotopically exchangeable U(VI) in the U-contaminated samples, hereafter referred to as "labile U". The quantity of labile U(VI) in each experiment can be obtained from the mass balances for U(VI) and ^{233}U(VI) (eq 2). Because of oxic conditions, it is assumed that no ^{233}U(VI) is reduced by the sediment surfaces and that no dissolved U(IV) is present. The labile fraction of total U in each experiment includes all U atoms that participate in dynamic chemical processes (sorption, desorption, precipitation, dissolution, oxidation) that achieve equilibrium with the aqueous phase. Within the time scale of the experiment, ^{233}U(VI) tracer is distributed between the aqueous and sediment phases by these dynamic

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TABLE 1. Comparison of Experimental K_D's with Surface Complexation Model (NEM) Simulated K_D's for Field ("In-Situ") Conditions at the Naturita Field Site and Laboratory Conditions[f]

	lab conditions		field conditions		
sediment	isotope exchange	NEM	CARB[a]	isotope exchange[a]	NEM
NAT-01	9.52	13.1	4.01	4.24	2.16
NAT-02	10.9	15.2	4.63	5.22	3.25
NAT-03	23.9	32.8	0.80	0.941	3.45
NAT-04	18.1	37.9	1.14	1.21	3.04
NAT-05	18.9	30.5	1.39	1.63	3.15
NAT-06	46.3	27.0	3.56	3.95	4.01
NAT-07	22.6	42.3	1.44	1.75	4.01
NAT-08	24.1	33.0	0.80	0.857	2.56
NAT-10	18.3	28.8	0.73	0.961	2.60
NAT-11	26.1	46.3	0.45	0.513	3.42
NAT-12	19.5	19.4	1.18	1.46	2.36
MAU-01	10.0	18.9	1.62	2.13	2.34
MAU-02	22.5	18.2	6.66	7.38	4.70
MAU-03	8.65	7.73	21.9	25.1	2.91
MAU-04	11.72	8.64	35.4	36.9	3.42
NABS[b]	*d*	*d*	31.1[d]	19.9	4.41
NABS[c]	*d*	*d*	16.0[e]	10.3	2.60

[a] U solid concentration in mol/g determined experimentally by either carbonate extraction or isotope exchange, and for the solution concentration the actual U concentration was used. [b] For averaged conditions for DOE-547 from Apr 2, 1999 to Sep 10, 2001; [Alk] = 3.20 mequiv/L, pH 7.29, and $2.8 \cdot 10^{-8}$ M U (6.7 ppb U). [c] For averaged conditions reported for NAT-20, −21, and −22 from Sep 21, 1999 to Sep 10, 2001; [Alk] = 4.72 mequiv/L, pH 6.99, and $5.43 \cdot 10^{-8}$ M U (12.9 ppb U). [d] Depending on solid-to-liquid ratio K_D varies from 6.5 to 16.8 mL/g for isotopic exchange, and NEM calculated values range from 16 to 28 mL/g. [e] The U concentration on the solid based on CARB extraction is $8.7 \cdot 10^{-10}$ mol/g and is taken from Davis and Curtis (*11*). [f] Units of K_D's are mL/g.

processes, and at isotopic equilibrium, it can be assumed that all U(VI) isotopes *in the labile fraction* are distributed in a similar manner.

K_D values (Table 1) and labile fractions of total U were determined for each of the 15 U-contaminated samples (not for NAT-25B) and for NABS (Table 1). Development of solution activities over time during isotope exchange is shown in Figure S4.

U Solution Speciation. HYDRAQL (*36*) calculations show that the $Ca_2UO_2(CO_3)_3{}^0_{aq}$ complex is the prevalent species under Naturita field conditions as well as under conditions of AGW-3 extractions and isotopic exchange experiments in the laboratory conducted in this study. The complex $UO_2(CO_3)_3{}^{4-}$ is of secondary importance, whereas $UO_2(CO_3)_2{}^{2-}$ and $CaUO_2(CO_3)_3{}^{2-}$ are species below 5% (see Figure S5).

Discussion

Comparison of K_D Values for Contaminated Sediments and NABS for CO_2(g) in Air. Use of the ^{233}U tracer in the isotopic exchange experiments allows a direct determination of the distribution coefficient, K_D, for each sediment sample. K_D can be determined solely by ^{233}U activity measurements according to eq 3

$$K_D = 1000 \cdot \frac{V}{w} \cdot \left(\frac{C_{labile}}{C} - 1 \right) = 1000 \cdot \frac{V}{w} \cdot \left(\frac{A_{System}}{A} - 1 \right) \quad (3)$$

where V/w is the solution-to-solid ratio of the system in L/g and the other parameters were defined above (eq 2). It is important to note that C_{labile} only refers to the labile fraction of U(VI) that participates in isotope exchange processes and does not include U fixed in the mineral matrix.

Table 1 shows the K_D values determined by isotopic exchange under laboratory conditions. K_D values for the contaminated sediment samples with alkalinities between 1.4 and 2.3 mequiv/L fell into a relatively narrow range of 9−26 mL/g (with the exception of NAT-06, 46 mL/g). This range of K_D values for the contaminated sediments compares well with the range 6.5−17 mL/g (with alkalinities of 0.8−1.4 mequiv/L) measured for the background NABS sample in systems equilibrated with air (Table 1, footnote d). Concentrations of both total U(VI) and the alkalinity were higher for the contaminated sediments than for NABS, whereas pH values fell within the range of 7.9 ± 0.2 for both sample series (see Table S5 in the Supporting Information). A possible reason that the samples acquired different alkalinites were different equilibration times for the isotopic exchange experiments on the contaminated sediments (10 months) and on NABS (7−9 days). The effects of pH, alkalinity, and total dissolved U(VI) on K_D values will be discussed below when a SCM is applied to the experimental data to calculate K_D.

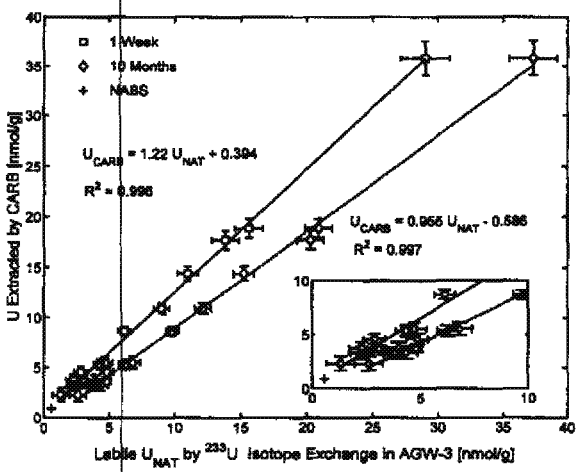

FIGURE 4. Relation between labile U(VI) determined by isotopic exchange measurements with U(VI) extracted by the CARB solution for 15 U-contaminated sediment samples and NABS. CARB extraction lasted 2 weeks, isotope exchange 1 week and 10 months.

Comparison of Isotopic Exchange with CARB Extracted U. If there was no oxidation of U(IV) on the sediments during air-drying, then it is likely that the measured labile fraction of sediment U(VI) is equivalent to adsorbed U(VI), since U(VI) solid phases were undersaturated in Naturita groundwater. The CARB extraction was designed to desorb U(VI) without dissolving the crystalline matrix, so a comparison of these results is warranted. Figure 4 shows plots of U(VI) extracted by the CARB solution (2 weeks) versus the labile fractions of sediment U(VI) determined by 1 week or 10 months of isotopic exchange. U(VI) extracted by the CARB solution is very well correlated with results obtained for both sets of isotope exchange data. For the 1-week exchange data, the slope, intercept, and R^2 of a linear regression line are 1.22 ± 0.02, $(3.9 \pm 2.2) \cdot 10^{-10}$ mol/g, and 0.996, respectively, indicating that the CARB extracted U(VI) was, on average, 22% greater than that determined by isotopic exchange for 1 week. After 10 months, the labile fraction estimated from isotope exchange was within 5% of the CARB extraction data but slightly higher. The corresponding values of a linear regression line are 0.96 ± 0.01, $(-5.9 \pm 2.0) \cdot 10^{-10}$ mol/g, and 0.997 for slope, intercept, and R^2, respectively. The proximity of the slope to one suggests that both methods likely access essentially the same reservoir of U(VI). These results are encouraging because they suggest that the CARB extraction method is a rapid, mild, very practical, inexpensive, and simple experimental technique to determine the labile U(VI) in contaminated sediments.

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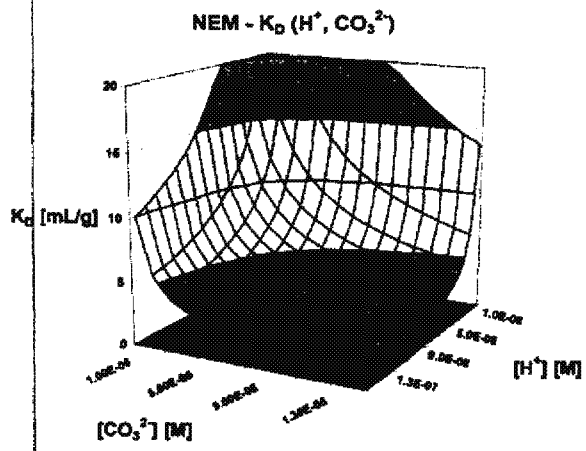

FIGURE 5. NEM simulations of K_D values as a function of proton and carbonate ion concentrations. The range of proton concentrations and carbonate ion concentration covers the entire space of the variables for conditions encountered at the Naturita field site (pH 6.8–7.4 and alkalinities 3–10 mequiv/L) as well as laboratory conditions (pH 7.8–8.0, alkalinities 1–2.4 mequiv/L). The total dissolved U(VI) concentration is $3 \cdot 10^{-6}$ M.

For the NABS sample, 7–9 days of isotopic exchange gave a concentration of labile uranium of $(5.57 \pm 0.22) \cdot 10^{-10}$ mol/g in excellent agreement with the value obtained from the 1-week carbonate extraction of $5.7 \cdot 10^{-10}$ mol/g. A 3-week carbonate extraction gave a somewhat higher value of $8.7 \cdot 10^{-10}$ mol/g. Possible reasons for this difference might be sample inhomogeneities.

Calculation of In-Situ Field K_D. In the alluvial aquifer at Naturita, pH values range from 6.8 to 7.4, alkalinities from 2.5 to 10 mequiv/L, and dissolved U(VI) from $2 \cdot 10^{-8}$ M to $1 \cdot 10^{-5}$ M (*11*). From the alkalinities and pH, equilibrium partial pressures of CO_2 were calculated, yielding values between 0.6 and 7%. The increased levels of CO_2(g) in the aquifer are thought to be the result of biological activity that occurs primarily after river water recharges the alluvial aquifer. Because of the lower alkalinities and partial pressures of CO_2, K_D values measured in the isotopic exchange experiments are expected to be higher than those that apply under field conditions, since formation of aqueous Ca–U(VI)–carbonato complexes (Table S2 in the Supporting Information) at higher alkalinities should lower the K_D values (see Figure 5 and discussion below). Table 1 gives estimates of in-situ K_D values, based on the measured U(VI) concentration in groundwater (Table S4) and the estimates of adsorbed U(VI) from the CARB extractions and isotopic exchange experiments with sediments from the same location. With the exception of MAU-03 and MAU-04, note how the in-situ K_D values (Table 1, columns 4 and 5) are considerably smaller than the air-equilibrated laboratory values (Table 1, column 2).

In practice, most K_D values used in performance assessment modeling of U(VI) transport in groundwater are based on laboratory adsorption experiments with uncontaminated sediments in systems equilibrated with atmospheric levels of CO_2(g) (*13*). Thus, the CARB extraction can be very useful for studies of U-contaminated sites because the extraction can provide an independent estimate of field adsorbed U(VI), so that K_D values can be calculated under in-situ aquifer conditions.

Comparison with Nonelectrostatic Surface Complexation Model (NEM) K_D's. A nonelectrostatic surface complexation model (NEM) was developed to describe U(VI) adsorption by the NABS sample under conditions of variable U(VI) concentrations, pH values, and partial pressures of CO_2(g). The modeling strategy, model calibration, and details of the model are given in ref *11* and are summarized in the Supporting Information. The reaction stoichiometries and stability constants for reactions involving surface sites are given in Table S3 in the Supporting Information (stability constants for solution species are listed in Table S2 in the Supporting Information).

K_D values computed with the NEM can be compared with both K_D values observed at the end of the AGW-3 extractions and K_D values calculated for the in-situ field conditions. In the case of AGW-3 extractions, experimental values for the specific surface area, pH, alkalinity, total dissolved uranium, and solid-solution ratio used in the laboratory experiments were used as input to the NEM calculations (Table S5 in the Supporting Information). Equilibrium with calcite was assumed. Table 1 (column 3) compares the model-predicted K_D values with those determined at the end of isotope exchange experiments in AGW-3 solutions (column 2). Many of the model-predicted K_D values agree very well with the measured ones, and all except NAT-04 are within a factor of 2. The fact that the only sediment characterization involved in the model input was the specific surface area leads to the hypothesis that the variability in U(VI) K_D values is largely due to variation of aqueous chemical conditions. Pabalan et al. (*14*) and Davis et al. (*10*) have observed that a wide range of K_D values for U(VI) obtained for many different solids could be reduced to a single parameter, K_a [mL/m^2], that varied only with aqueous conditions. K_a values are obtained by dividing K_D by the specific surface area of the solid phase.

Observed and NEM-predicted K_D values for the < 3 mm material under in-situ conditions are listed in Table 1 (columns 4–6, respectively). The model predictions were performed using field data (pH, alkalinity, dissolved U(VI), Na^+, K^+, Mg^{2+}, Cl^-, and SO_4^{2-}, see Table S4 in the Supporting Information) for each individual well in conjunction with the measured specific surface areas of the contaminated sediment sample from each well. Equilibrium with calcite was assumed in the simulations. The predicted K_D values are compared with observed K_D values determined from both the CARB extractions and the isotopic exchange experiments (Table 1). The model-predicted K_D values generally agree to within a factor of 2–3 with the estimates from the experimental data, which is a very encouraging result. The results show that isotopic exchange and desorption extraction methods that are custom-designed for the appropriate site environmental conditions can be an important part of a field characterization and modeling program. The experimental determinations of adsorbed U(VI) in the Naturita alluvial aquifer build confidence in the semiempirical SCM (such as NEM) developed from experimental data with uncontaminated sediments and may improve the credibility of the initial conditions of transport simulations for the aquifer.

The dependence of K_D on proton and carbonate concentrations was simulated with NEM and is shown in Figure 5 for total dissolved U(VI) of $3 \cdot 10^{-6}$ M. Typical values for major ions were chosen (Na^+ $1 \cdot 10^{-2}$ M, K^+ $6 \cdot 10^{-4}$ M, Mg^{2+} $3 \cdot 10^{-3}$ M, Cl^- $2 \cdot 10^{-3}$ M, SO_4^{2-} $8 \cdot 10^{-3}$ M). The system was assumed to be in equilibrium with calcite. For the specific surface area a value of 12.9 m^2/g was chosen (average of the contaminated sediments). The range of the two variables covered in Figure 5 reflects the experimental conditions in the laboratory and in the field investigated in this study (pH 6.8–8 and carbonate concentrations of $1 \cdot 10^{-6}$–$1.5 \cdot 10^{-5}$ M corresponding to alkalinities of 1–10 mequiv/L). Figure 5 shows a rapidly decreasing K_D both with increasing proton and carbonate concentrations. At a total dissolved U(VI) concentration of $3 \cdot 10^{-8}$ M and low proton concentration the K_D values are approximately a factor of 3 higher than at $3 \cdot 10^{-6}$ M for all carbonate concentrations. However, the difference becomes smaller at high proton and high carbonate concentrations.

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The exceptions for the good predictive capability of NEM for samples in this study are in-situ K_D values for the sediments from wells MAU-03 and MAU-04, for which the model-predicted values are about an order of magnitude lower than those estimated from the experimental data. A possible reason for the discrepancies in the model-predicted values for the MAU-03 and MAU-04 locations is that these wells are the only ones at the site located in a downgradient, marshy area with cottonwood and willow trees. The average dissolved oxygen is $2.2 \cdot 10^{-5}$ M (0.7 ppm) at MAU-04 and $6.3 \cdot 10^{-6}$ M (0.2 ppm) at MAU-03 and the average Fe(II) values are $9 \cdot 10^{-7}$ M (0.050 ppm) and $2.4 \cdot 10^{-5}$ M (1.34 ppm), respectively. The average Fe(II) for all wells is $8.4 \cdot 10^{-6}$ M (0.47 ppm). The Fe(II) concentration $2.24 \cdot 10^{-5}$ M (1.25 ppm) measured at well MAU-04 in the field in the fall of 1998 (when the sediment was sampled) was higher than at other locations in the alluvial aquifer, and springs that emanate from near the water table downgradient of MAU-03 and MAU-04 had red Fe-bearing precipitates. Although the glovebag CARB extractions conducted in the field suggested that there was little U(IV) associated with NAT-25J sediments (Table S1 in the Supporting Information), it is possible that there was U(IV) associated with the MAU-03 and MAU-04 sediments at the time of sampling in 1998. Because the sediments were later air-dried, any U(IV) in surface coatings was likely oxidized to U(VI) and then desorbed during the CARB extractions or the isotopic exchange experiments. This could lead to overestimates of in-situ U(VI) K_D values in the experimental "observations" in comparison to the model-predicted values. Field experiments with fresh sediments from wells MAU-03 and MAU-04 to assess the oxidation state of U will be part of a future project.

Comparison of in-situ U(VI) K_D values in the uncontaminated portion of the aquifer is complicated by several factors, especially the choice of groundwater concentrations of U(VI), alkalinity, and pH. Also, for the NABS sample, there is a factor of approximately 1.6 between the experimentally determined K_D values from the carbonate extraction (3-week) and isotopic exchange methods. The NABS sample was collected by a backhoe below a gravel pit that had been excavated to the groundwater table. Unfortunately, groundwater samples were not collected at the same time and location. The average chemical conditions after 1999 at well DOE-547 were pH 7.29, alkalinity 3.2 mequiv/L, and U(VI) $2.8 \cdot 10^{-8}$ M (6.7 ppb U) which leads to a calculated K_D of 4.41 mL/g (Table 1). NEM calculations show that the predicted K_D values are particularly sensitive to alkalinity at values below 4 mequiv/L. One water sample collected in November 2000 at DOE 547 had an alkalinity of 2.48 mequiv/L, pH 7.16, and U(VI) $1.85 \cdot 10^{-8}$ M, which yields a predicted K_D of 5.49. The latter predicted value agrees better with the observed K_D of 10.3 mL/g determined from isotopic exchange measurements and average water concentrations.

Acknowledgments

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Supporting Information Available

Analytical methods, modeling of U(VI) adsorption data on NABS with a nonelectrostatic surface complexation model (NEM), Tables S1–S5, and Figures S1–S5. This material is available free of charge via the Internet at http://pubs.acs.org.

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ES0341236

PREP BATCH REPORT

Prep Batch **118169** | Prep Code: **PRP-3050** | Prep Temp **NA °C** | Technician: **Patrick T. Zepeda** | Batch Units: **G** | Prep Start Date: **2/5/2018 7:56:33 AM** | Prep End Date: **2/5/2018 2:56:00 PM**

Sample ID	Matrix	pH	Initial Samp Amt	Sol Added	Sol Recovered	Final Vol (mL)	Factor	Balance	Prep Start Date	Prep End Date
MB-118169			1.000	0	0	50.00	50		2/5/2018	2/5/2018
SRM-118169			1.008	0	0	50.00	49.62	Bal HZW1	2/5/2018	2/5/2018
B18020067-001B	Soil		1.058	0	0	50.00	47.26	Bal HZW1	2/5/2018	2/5/2018
B18020067-002B	Soil		1.056	0	0	50.00	47.37	Bal HZW1	2/5/2018	2/5/2018
B18020068-001B	Soil		1.004	0	0	50.00	49.81	Bal HZW1	2/5/2018	2/5/2018
B18020068-002B	Soil		1.040	0	0	50.00	48.09	Bal HZW1	2/5/2018	2/5/2018
B18020068-003B	Soil		1.028	0	0	50.00	48.66	Bal HZW1	2/5/2018	2/5/2018
B18020068-004B	Soil		1.016	0	0	50.00	49.21	Bal HZW1	2/5/2018	2/5/2018
B18020068-005B	Soil		1.006	0	0	50.00	49.71	Bal HZW1	2/5/2018	2/5/2018
B18020068-006B	Soil		1.005	0	0	50.00	49.75	Bal HZW1	2/5/2018	2/5/2018
B18020068-007B	Soil		1.084	0	0	50.00	46.12	Bal HZW1	2/5/2018	2/5/2018
B18020068-008B	Soil		1.137	0	0	50.00	43.98	Bal HZW1	2/5/2018	2/5/2018
B18020068-009B	Soil		1.004	0	0	50.00	49.79	Bal HZW1	2/5/2018	2/5/2018
B18020068-010B	Soil		1.048	0	0	50.00	47.69	Bal HZW1	2/5/2018	2/5/2018
B18020068-011B	Soil		1.042	0	0	50.00	47.98	Bal HZW1	2/5/2018	2/5/2018
B18020068-012B	Soil		1.062	0	0	50.00	47.09	Bal HZW1	2/5/2018	2/5/2018
B18020068-013B	Soil		1.011	0	0	50.00	49.45	Bal HZW1	2/5/2018	2/5/2018
B18020068-014B	Soil		1.014	0	0	50.00	49.33	Bal HZW1	2/5/2018	2/5/2018
B18020068-014BMS3	Soil		1.003	0	0	50.00	49.85	Bal HZW1	2/5/2018	2/5/2018
B18020068-014BMSD3	Soil		1.004	0	0	50.00	49.82	Bal HZW1	2/5/2018	2/5/2018
B18020068-015B	Soil		1.010	0	0	50.00	49.5	Bal HZW1	2/5/2018	2/5/2018
B18020068-016B	Soil		1.026	0	0	50.00	48.71	Bal HZW1	2/5/2018	2/5/2018
B18020068-017B	Soil		1.008	0	0	50.00	49.6	Bal HZW1	2/5/2018	2/5/2018
B18020068-018B	Soil		1.029	0	0	50.00	48.61	Bal HZW1	2/5/2018	2/5/2018

Number	Reagent Name	Exp Date
9664	Hydrogen Peroxide 30% Solution 2017060717	9/8/2022
9755	Nitric Acid Instra Analyzed 0000183840	8/10/2022
9813	50 mL Digestion Cup	11/7/2022
9848	Hydrochloric Acid Instra Analyzed 0000186764	8/29/2022
9993	FilterMate SC0408	1/2/2023

Spk ID	Spike Name	SampType	AmtAdd	Exp Date
ME ICV-1A 1707	EL-MSICV-1A	MS3	0.5	8/1/2018
ME171215_3050	AUDIGSPK	MS3	0.5	3/15/2018
ME180110 MSIC	EL-MSICV-2	MS3	0.5	2/1/2019
ME180130 SRM	SRM 3050 HF	SRM3	0.5	12/31/2020

Energy Laboratories Inc

ANALYTICAL RUN Summary

27-Feb-18

Run ID ICP204-B_180206A

Run Start Date:	2/6/2018 11:19:19 A
Analyst:	Stephanie L. Farmer
Ical:	0
Column ID:	
Comments:	

Instrument ID	Description
07J20627	Metals 100-1000 uL Adjustable Pipette
12X5317	Metals 100-1000 uL Adjustable Pipette
15549647	Metals 10-100 uL Adjustable Pipette
15571644	Metals 20-200 uL Adjusatble Pipette
340760037	Metals 100-1000 uL Adjustable Pipette
340760040	Metals 100-1000 uL Adjustable Pipette
340782036	Metals 1-5 mL Adjustable Pipette
440760303	Metals 100-1000 uL Adjustable Pipette
440760412	Metals 100-1000 uL Adjustable Pipette
440780018	Metals 1-5 mL Adjustable Pipette
440780025	Metals 1-5 mL Adjustable Pipette
440780027	Metals 1-5 mL Adjustable Pipette
ICP203-B	Thermo iCAP 6500
O33504C	Metals 10-100 uL Adjustable Pipette

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
ICP171128A	QCS-ICP					ICV	3/1/2018
ICP171213A	AUDIRSPK	0.05	ml	5		MS2	5/16/2018
ICP180104C	ICSAB-ICP					ICSA	4/2/2018
ICP180115A	ICSA-ICP					ICSAB	4/2/2018
ICP180116B	ULR1-ICP					ULR1	12/5/2018
ICP180116C	ULR2-ICP					ULR2	12/5/2018
ICP180116D	ULR3-ICP					ULR3	1/3/2019
ICP180116E	ULR4-ICP					ULR4	1/3/2019
ICP180125A	S1B					ICAL	9/11/2018
ICP180125B	S2B					ICAL	12/5/2018
ICP180125C	S3B					ICAL	12/5/2018
ICP180125D	S4B					ICAL	1/3/2019
ICP180125E	CCV-ICP					CCV	9/11/2018
ICP180129A	ICP LLRV working standard					CRI	1/3/2019
ICP180202A	ULR5-ICP					ULR5	9/20/2018
ME170227A	EL-MSICV-1A	0.05	ml	5		MS2	3/1/2018
ME170523A	EL-MSICV-2	0.05	ml	5		MS2	7/1/2018

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684009	Blank	ICP-200.7-W-D	ICAL		2/6/2018 10:41:1	1	R294307		0	0	

1

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	Cts/S	0.31553	0.31553		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Antimony	A	Cts/S	2.1287	2.1287		0	0	0	0.0356182	0.05	225	0%	0	0	0%	
Arsenic	A	Cts/S	-0.12666	-0.12666		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	Cts/S	19.3	19.3		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	Cts/S	13.867	13.867		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	Cts/S	8.7833	8.7833		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	Cts/S	2.9376	2.9376		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	Cts/S	2.0848	2.0848		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	Cts/S	-0.35109	-0.35109		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	Cts/S	-2.3598	-2.3598		0	0	0	0.0033639	0.02	450	0%	0	0	0%	
Copper	A	Cts/S	8.6667	8.6667		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	Cts/S	1.6333	1.6333		0	0	0	0.0189485	0.1	90	0%	0	0	0%	
Iron	A	Cts/S	0.95	0.95		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lead	A	Cts/S	2.718	2.718		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Lithium	A	Cts/S	60.159	60.159		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	Cts/S	8.4667	8.4667		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	Cts/S	-1.2667	-1.2667		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Mercury	A	Cts/S	0.94216	0.94216		0	0	0	0.0100947	0.02	45	0%	0	0	0%	
Molybdenum	A	Cts/S	1.3866	1.3866		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Nickel	A	Cts/S	1.231	1.231		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	Cts/S	0.07111	0.07111		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	Cts/S	47.667	47.667		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	Cts/S	0.65551	0.65551		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	Cts/S	16.25	16.25		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silver	A	Cts/S	-3.45	-3.45		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	Cts/S	91.28	91.28		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	Cts/S	20.85	20.85		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tellurium	A	Cts/S	-5.6396	-5.6396		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	Cts/S	-0.01333	-0.01333		0	0	0	0.0116401	0.5	225	0%	0	0	0%	
Tin	A	Cts/S	-0.48886	-0.48886		0	0	0	0.0081865	0.1	225	0%	0	0	0%	
Titanium	A	Cts/S	150.02	150.02		0	0	0	0.002716	0.01	225	0%	0	0	0%	
Uranium	A	Cts/S	32.367	32.367		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	Cts/S	4.05	4.05		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	Cts/S	10.397	10.397		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	34.762	34.762		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684010	CalibStd-1	ICP-200.7-W-D	ICAL		2/6/2018 10:45:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	Cts/S	93750	93750		0	0	0	0.1071422	1	180	0%	0	0	0%	
Iron	A	Cts/S	8599.7	8599.7		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lithium	A	Cts/S	48177	48177		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	Cts/S	233160	233160		0	0	0	0.0116555	1	180	0%	0	0	0%	
Phosphorus	A	Cts/S	585.95	585.95		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	Cts/S	33294	33294		0	0	0	0.0854754	1	900	0%	0	0	0%	
Sodium	A	Cts/S	144600	144600		0	0	0	0.1131395	1	450	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684011	CalibStd-2	ICP-200.7-W-D	ICAL		2/6/2018 10:48:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	Cts/S	1113.6	1113.6		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Barium	A	Cts/S	656250	656250		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Chromium	A	Cts/S	6860.2	6860.2		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Copper	A	Cts/S	12546	12546		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	Cts/S	2815.1	2815.1		0	0	0	0.0189485	0.1	90	0%	0	0	0%	
Mercury	A	Cts/S	80.375	80.375		0	0	0	0.0100947	0.02	45	0%	0	0	0%	
Nickel	A	Cts/S	7124.5	7124.5		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Silver	A	Cts/S	540.36	540.36		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Tellurium	A	Cts/S	611.26	611.26		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	Cts/S	536.46	536.46		0	0	0	0.0116401	0.5	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684012	CalibStd-3	ICP-200.7-W-D	ICAL		2/6/2018 10:52:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	Cts/S	554.47	554.47		0	0	0	0.0356182	0.05	225	0%	0	0	0%	
Arsenic	A	Cts/S	494.51	494.51		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Beryllium	A	Cts/S	285340	285340		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	Cts/S	10946	10946		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	Cts/S	10126	10126		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Cobalt	A	Cts/S	6012.2	6012.2		0	0	0	0.0033639	0.02	450	0%	0	0	0%	
Lead	A	Cts/S	1043.9	1043.9		0	0	0	0.0187623	0.05	900	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684012	CalibStd-3	ICP-200.7-W-D	ICAL		2/6/2018 10:52:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	Cts/S	55007	55007		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	Cts/S	3272.1	3272.1		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Selenium	A	Cts/S	348.57	348.57		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	Cts/S	4543.2	4543.2		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Strontium	A	Cts/S	1083900	1083900		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tin	A	Cts/S	882.65	882.65		0	0	0	0.0081865	0.1	225	0%	0	0	0%	
Titanium	A	Cts/S	52362	52362		0	0	0	0.002716	0.01	225	0%	0	0	0%	
Vanadium	A	Cts/S	14428	14428		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	Cts/S	12013	12013		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	9718.81344	9718.81344		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684013	CalibStd-4	ICP-200.7-W-D	ICAL		2/6/2018 10:56:4	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	Cts/S	1115.7	1115.7		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684014	ICV	ICP-200.7-W-D	CCV1		2/6/2018 11:00:3	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.539	2.539		2.5	0	0	0.0066084	0.1	18	102%	95	105	0%	
Antimony	A	mg/L	2.5345	2.5345		2.5	0	0	0.0356182	0.05	225	101%	95	105	0%	
Arsenic	A	mg/L	2.5434	2.5434		2.5	0	0	0.0231651	0.1	225	102%	95	105	0%	
Barium	A	mg/L	2.5597	2.5597		2.5	0	0	0.0003929	0.1	18	102%	95	105	0%	
Beryllium	A	mg/L	1.2666	1.2666		1.25	0	0	0.0002318	0.01	22.5	101%	95	105	0%	
Boron	A	mg/L	2.5136	2.5136		2.5	0	0	0.0080048	0.1	450	101%	95	105	0%	
Cadmium	A	mg/L	2.5014	2.5014		2.5	0	0	0.0010328	0.01	90	100%	95	105	0%	
Calcium	A	mg/L	26.129	26.129		25	0	0	0.1071422	1	180	105%	95	105	0%	
Chromium	A	mg/L	2.5336	2.5336		2.5	0	0	0.0010626	0.05	225	101%	95	105	0%	
Cobalt	A	mg/L	2.4754	2.4754		2.5	0	0	0.0033639	0.02	450	99%	95	105	0%	
Copper	A	mg/L	2.5233	2.5233		2.5	0	0	0.0048764	0.01	225	101%	95	105	0%	
Gold	A	mg/L	2.5062	2.5062		2.5	0	0	0.0189485	0.1	90	100%	95	105	0%	
Iron	A	mg/L	2.6235	2.6235		2.5	0	0	0.0250321	0.0250321	360	105%	95	105	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684014	ICV	ICP-200.7-W-D	CCV1		2/6/2018 11:00:3	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	2.4685	2.4685		2.5	0	0	0.0187623	0.05	900	99%	95	105	0%	
Lithium	A	mg/L	1.315	1.315		1.25	0	0	0.0059040	0.1	22.5	105%	95	105	0%	
Magnesium	A	mg/L	26.248	26.248		25	0	0	0.0116555	1	180	105%	95	105	0%	
Manganese	A	mg/L	2.4789	2.4789		2.5	0	0	0.0010649	0.01	45	99%	95	105	0%	
Mercury	A	mg/L	1.0236	1.0236		1	0	0	0.0100947	0.02	45	102%	95	105	0%	
Molybdenum	A	mg/L	2.5147	2.5147		2.5	0	0	0.0031266	0.1	225	101%	95	105	0%	
Nickel	A	mg/L	2.4807	2.4807		2.5	0	0	0.0012530	0.05	225	99%	95	105	0%	
Phosphorus	A	mg/L	2.5755	2.5755		2.5	0	0	0.0425464	0.1	360	103%	95	105	0%	
Potassium	A	mg/L	26.218	26.218		25	0	0	0.0854754	1	900	105%	95	105	0%	
Selenium	A	mg/L	2.5173	2.5173		2.5	0	0	0.0234201	0.1	225	101%	95	105	0%	
Silicon	A	mg/L	5.1067	5.1067		5	0	0	0.0487685	0.1	450	102%	95	105	0%	
Silver	A	mg/L	1.0238	1.0238		1	0	0	0.0055813	0.01	2	102%	95	105	0%	
Sodium	A	mg/L	26.26	26.26		25	0	0	0.1131395	1	450	105%	95	105	0%	
Strontium	A	mg/L	2.5031	2.5031		2.5	0	0	0.0002417	0.1	18	100%	95	105	0%	
Tellurium	A	mg/L	2.531	2.531		2.5	0	0	0.0301968	0.1	90	101%	95	105	0%	
Thallium	A	mg/L	2.491	2.491		2.5	0	0	0.0116401	0.5	225	100%	95	105	0%	
Tin	A	mg/L	2.4797	2.4797		2.5	0	0	0.0081865	0.1	225	99%	95	105	0%	
Titanium	A	mg/L	2.512	2.512		2.5	0	0	0.002716	0.01	225	100%	95	105	0%	
Uranium	A	mg/L	2.5182	2.5182		2.5	0	0	0.1154022	0.1154022	900	101%	95	105	0%	
Vanadium	A	mg/L	2.5315	2.5315		2.5	0	0	0.0036660	0.1	225	101%	95	105	0%	
Zinc	A	mg/L	2.5016	2.5016		2.5	0	0	0.0023364	0.01	90	100%	95	105	0%	
Silica	C	mg/L	10.9242526	10.9242526		10.7	0	0	0.1043257	0.21392	100	102%	95	105	0%	
Silicon as SiO2	C	mg/L	10.9242526	10.9242526		10.7	0	0	0.1043257	0.21392	0	102%	95	105	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684015	CCB	ICP-200.7-W-D	CCB		2/6/2018 11:04:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0008	-0.0008		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	0.00222	0.00222		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00494	0.00494		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00037	0.00037		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.0002	0.0002		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00215	0.00215		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00038	0.00038		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684015	CCB	ICP-200.7-W-D	CCB		2/6/2018 11:04:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	mg/L	0.00254	0.00254		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00054	0.00054		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00073	0.00073		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	-0.00014	-0.00014		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00733	0.00733		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	-0.00014	-0.00014		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00094	-0.00094		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	-0.00007	-0.00007		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.0035	0.0035		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00024	0.00024		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	-0.00042	-0.00042		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00087	0.00087		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00042	-0.00042		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.0011	-0.0011		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.0004	0.0004		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.01281	0.01281		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.00095	0.00095		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	0.00119	0.00119		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0657	0.0657		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00028	0.00028		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01468	0.01468		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00287	0.00287		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	0.00058	0.00058		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00077	0.00077		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.01987	-0.01987		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00035	0.00035		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.0001	0.0001		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.00203224	0.00203224		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.00203224	0.00203224		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684016	MB-7400DIS18	ICP-200.7-W-D	MBLK		2/6/2018 11:08:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684016	MB-7400DIS18	ICP-200.7-W-D	MBLK		2/6/2018 11:08:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.00202	0		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.0001	0		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00229	0		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00017	0		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00007	0		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	-0.00066	0		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	-0.00004	0		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00348	0		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00066	0		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	-0.00005	0		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	-0.00052	0		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00315	0		0	0	0	0.0189485	0.1	90	0%	0	0	0%	
Iron	A	mg/L	-0.00052	0		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00562	0		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	-0.00011	0		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00034	0		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	-0.00001	0		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	-0.00081	0		0	0	0	0.0100947	0.02	45	0%	0	0	0%	
Molybdenum	A	mg/L	0.00077	0		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00027	0		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.003	0		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	-0.00002	0		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00174	0		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.02472	0		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	0.00021	0		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0675	0		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00002	0		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.0115	0		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00174	0		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	0.00143	0		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00038	0		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.06927	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00004	0		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	-0.00001	0		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.05288102	0		0	0	0	0.1043257	0.21392	100	0%	-0.05	0.05	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684016	MB-7400DIS18	ICP-200.7-W-D	MBLK		2/6/2018 11:08:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	0.05288102	0		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684017	LLRV	ICP-200.7-W-D	CRI		2/6/2018 11:12:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.10542	0.10542		0.1	0	0	0.0066084	0.1	18	105%	80	120	0%	
Antimony	A	mg/L	0.19639	0.19639		0.2	0	0	0.0356182	0.05	225	98%	80	120	0%	
Arsenic	A	mg/L	0.20847	0.20847		0.2	0	0	0.0231651	0.1	225	104%	80	120	0%	
Barium	A	mg/L	0.00304	0.00304		0.003	0	0	0.0003929	0.1	18	101%	80	120	0%	
Beryllium	A	mg/L	0.00208	0.00208		0.002	0	0	0.0002318	0.01	22.5	104%	80	120	0%	
Boron	A	mg/L	0.05026	0.05026		0.05	0	0	0.0080048	0.1	450	101%	80	120	0%	
Cadmium	A	mg/L	0.00487	0.00487		0.005	0	0	0.0010328	0.01	90	97%	80	120	0%	
Calcium	A	mg/L	0.32409	0.32409		0.3	0	0	0.1071422	1	180	108%	80	120	0%	
Chromium	A	mg/L	0.0412	0.0412		0.04	0	0	0.0010626	0.05	225	103%	80	120	0%	
Cobalt	A	mg/L	0.03091	0.03091		0.03	0	0	0.0033639	0.02	450	103%	80	120	0%	
Copper	A	mg/L	0.05229	0.05229		0.05	0	0	0.0048764	0.01	225	105%	80	120	0%	
Gold	A	mg/L	0.19856	0.19856		0.2	0	0	0.0189485	0.1	90	99%	80	120	0%	
Iron	A	mg/L	0.03079	0.03079		0.03	0	0	0.0250321	0.0250321	360	103%	80	120	0%	
Lead	A	mg/L	0.19804	0.19804		0.2	0	0	0.0187623	0.05	900	99%	80	120	0%	
Lithium	A	mg/L	0.05543	0.05543		0.05	0	0	0.0059040	0.1	22.5	111%	80	120	0%	
Magnesium	A	mg/L	0.08589	0.08589		0.08	0	0	0.0116555	1	180	107%	80	120	0%	
Manganese	A	mg/L	0.00487	0.00487		0.005	0	0	0.0010649	0.01	45	97%	80	120	0%	
Mercury	A	mg/L	0.10498	0.10498		0.1	0	0	0.0100947	0.02	45	105%	80	120	0%	
Molybdenum	A	mg/L	0.0393	0.0393		0.04	0	0	0.0031266	0.1	225	98%	80	120	0%	
Nickel	A	mg/L	0.0302	0.0302		0.03	0	0	0.0012530	0.05	225	101%	80	120	0%	
Phosphorus	A	mg/L	0.39751	0.39751		0.4	0	0	0.0425464	0.1	360	99%	80	120	0%	
Potassium	A	mg/L	0.53687	0.53687		0.5	0	0	0.0854754	1	900	107%	80	120	0%	
Selenium	A	mg/L	0.3081	0.3081		0.3	0	0	0.0234201	0.1	225	103%	80	120	0%	
Silicon	A	mg/L	0.30871	0.30871		0.3	0	0	0.0487685	0.1	450	103%	80	120	0%	
Silver	A	mg/L	0.05204	0.05204		0.05	0	0	0.0055813	0.01	2	104%	80	120	0%	
Sodium	A	mg/L	0.3968	0.3968		0.3	0	0	0.1131395	1	450	132%	80	120	0%	S
Strontium	A	mg/L	0.00207	0.00207		0.002	0	0	0.0002417	0.1	18	103%	80	120	0%	
Tellurium	A	mg/L	0.22137	0.22137		0.2	0	0	0.0301968	0.1	90	111%	80	120	0%	
Thallium	A	mg/L	0.20121	0.20121		0.2	0	0	0.0116401	0.5	225	101%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684017	LLRV	ICP-200.7-W-D	CRI		2/6/2018 11:12:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.10445	0.10445		0.1	0	0	0.0081865	0.1	225	104%	80	120	0%	
Titanium	A	mg/L	0.02067	0.02067		0.02	0	0	0.002716	0.01	225	103%	80	120	0%	
Uranium	A	mg/L	0.98336	0.98336		1	0	0	0.1154022	0.1154022	900	98%	80	120	0%	
Vanadium	A	mg/L	0.05019	0.05019		0.05	0	0	0.0036660	0.1	225	100%	80	120	0%	
Zinc	A	mg/L	0.02086	0.02086		0.02	0	0	0.0023364	0.01	90	104%	80	120	0%	
Silica	C	mg/L	0.66039243	0.66039243		0	0	0	0.1043257	0.21392	100	0%			0%	
Silicon as SiO2	C	mg/L	0.66039243	0.66039243		0	0	0	0.1043257	0.21392	0	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684018	LFB-7400DIS18	ICP-200.7-W-D	LFB		2/6/2018 11:15:5	1.03	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.70990291	4.8512		5	0	0	0.0068066	0.1	18	97%	85	115	0%	
Antimony	A	mg/L	0.96086408	0.98969		1	0	0	0.0366867	0.05	225	99%	85	115	0%	
Arsenic	A	mg/L	0.97087379	1		1	0	0	0.0238601	0.1	225	100%	85	115	0%	
Barium	A	mg/L	0.97203883	1.0012		1	0	0	0.0004047	0.1	18	100%	85	115	0%	
Beryllium	A	mg/L	0.48584466	0.50042		0.5	0	0	0.0002387	0.01	22.5	100%	85	115	0%	
Boron	A	mg/L	0.97262136	1.0018		1	0	0	0.008245	0.1	450	100%	85	115	0%	
Cadmium	A	mg/L	0.47867961	0.49304		0.5	0	0	0.0010638	0.01	90	99%	85	115	0%	
Calcium	A	mg/L	49.5145631	51		50	0	0	0.1103565	1	180	102%	85	115	0%	
Chromium	A	mg/L	0.95760194	0.98633		1	0	0	0.0010945	0.05	225	99%	85	115	0%	
Cobalt	A	mg/L	0.93635922	0.96445		1	0	0	0.0034648	0.02	450	96%	85	115	0%	
Copper	A	mg/L	0.95516505	0.98382		1	0	0	0.0050227	0.01	225	98%	85	115	0%	
Gold	A	mg/L	0.91762136	0.94515		1	0	0	0.019517	0.1	90	95%	85	115	0%	
Iron	A	mg/L	4.96572816	5.1147		5	0	0	0.0257830	0.0257830	360	102%	85	115	0%	
Lead	A	mg/L	0.93598058	0.96406		1	0	0	0.0193251	0.05	900	96%	85	115	0%	
Lithium	A	mg/L	1.00019417	1.0302		1	0	0	0.0060811	0.1	22.5	103%	85	115	0%	
Magnesium	A	mg/L	49.415534	50.898		50	0	0	0.0120051	1	180	102%	85	115	0%	
Manganese	A	mg/L	4.74766990	4.8901		5	0	0	0.0010968	0.01	45	98%	85	115	0%	
Mercury	A	mg/L	0.96838835	0.99744		1	0	0	0.0103975	0.02	45	100%	85	115	0%	
Molybdenum	A	mg/L	0.94225243	0.97052		1	0	0	0.0032204	0.1	225	97%	85	115	0%	
Nickel	A	mg/L	0.93642718	0.96452		1	0	0	0.0012906	0.05	225	96%	85	115	0%	
Phosphorus	A	mg/L	9.86407767	10.16		10	0	0	0.0438228	0.1	360	102%	85	115	0%	
Potassium	A	mg/L	49.8864078	51.383		50	0	0	0.0880397	1	900	103%	85	115	0%	
Selenium	A	mg/L	0.95629126	0.98498		1	0	0	0.0241227	0.1	225	98%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684018	LFB-7400DIS18	ICP-200.7-W-D	LFB		2/6/2018 11:15:5	1.03	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	mg/L	9.68368932	9.9742		10	0	0	0.0502316	0.1	450	100%	85	115	0%	
Silver	A	mg/L	0.46815534	0.4822		0.5	0	0	0.0057488	0.01	2	96%	85	115	0%	
Sodium	A	mg/L	49.5922330	51.08		50	0	0	0.1165337	1	450	102%	85	115	0%	
Strontium	A	mg/L	0.9625534	0.99143		1	0	0	0.0002489	0.1	18	99%	85	115	0%	
Tellurium	A	mg/L	0.97427184	1.0035		1	0	0	0.0311027	0.1	90	100%	85	115	0%	
Thallium	A	mg/L	0.93453398	0.96257		1	0	0	0.0119893	0.5	225	96%	85	115	0%	
Tin	A	mg/L	0.93247573	0.96045		1	0	0	0.0084321	0.1	225	96%	85	115	0%	
Titanium	A	mg/L	0.9578835	0.98662		1	0	0	0.0027974	0.01	225	99%	85	115	0%	
Uranium	A	mg/L	0.91694175	0.94445		1	0	0	0.1188643	0.1188643	900	94%	85	115	0%	
Vanadium	A	mg/L	0.97078641	0.99991		1	0	0	0.003776	0.1	225	100%	85	115	0%	
Zinc	A	mg/L	0.95603883	0.98472		1	0	0	0.0024065	0.01	90	98%	85	115	0%	
Silica	C	mg/L	20.7153482	21.3368086		21.392	0	0	0.1074554	0.21392	100	100%	85	115	0%	
Silicon as SiO2	C	mg/L	20.7153482	21.3368086		21.392	0	0	0.1074554	0.21392	0	100%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684019	QCS	ICP-200.7-W-D	ICV		2/6/2018 11:19:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	3.9158	3.9158		4	0	0	0.0066084	0.1	18	98%	95	105	0%	
Antimony	A	mg/L	0.80314	0.80314		0.8	0	0	0.0356182	0.05	225	100%	95	105	0%	
Arsenic	A	mg/L	0.79785	0.79785		0.8	0	0	0.0231651	0.1	225	100%	95	105	0%	
Barium	A	mg/L	0.80181	0.80181		0.8	0	0	0.0003929	0.1	18	100%	95	105	0%	
Beryllium	A	mg/L	0.40097	0.40097		0.4	0	0	0.0002318	0.01	22.5	100%	95	105	0%	
Boron	A	mg/L	0.81028	0.81028		0.8	0	0	0.0080048	0.1	450	101%	95	105	0%	
Cadmium	A	mg/L	0.3932	0.3932		0.4	0	0	0.0010328	0.01	90	98%	95	105	0%	
Calcium	A	mg/L	40.433	40.433		40	0	0	0.1071422	1	180	101%	95	105	0%	
Chromium	A	mg/L	0.7894	0.7894		0.8	0	0	0.0010626	0.05	225	99%	95	105	0%	
Cobalt	A	mg/L	0.77001	0.77001		0.8	0	0	0.0033639	0.02	450	96%	95	105	0%	
Copper	A	mg/L	0.7942	0.7942		0.8	0	0	0.0048764	0.01	225	99%	95	105	0%	
Gold	A	mg/L	1.9366	1.9366		2	0	0	0.0189485	0.1	90	97%	95	105	0%	
Iron	A	mg/L	4.1182	4.1182		4	0	0	0.0250321	0.0250321	360	103%	95	105	0%	
Lead	A	mg/L	0.77565	0.77565		0.8	0	0	0.0187623	0.05	900	97%	95	105	0%	
Lithium	A	mg/L	0.83399	0.83399		0.8	0	0	0.0059040	0.1	22.5	104%	95	105	0%	
Magnesium	A	mg/L	40.88	40.88		40	0	0	0.0116555	1	180	102%	95	105	0%	
Manganese	A	mg/L	3.9249	3.9249		4	0	0	0.0010649	0.01	45	98%	95	105	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684019	QCS	ICP-200.7-W-D	ICV		2/6/2018 11:19:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Mercury	A	mg/L	1.015	1.015		1	0	0	0.0100947	0.02	45	101%	95	105	0%	
Molybdenum	A	mg/L	0.78287	0.78287		0.8	0	0	0.0031266	0.1	225	98%	95	105	0%	
Nickel	A	mg/L	0.77215	0.77215		0.8	0	0	0.0012530	0.05	225	97%	95	105	0%	
Phosphorus	A	mg/L	8.1244	8.1244		8	0	0	0.0425464	0.1	360	102%	95	105	0%	
Potassium	A	mg/L	41.519	41.519		40	0	0	0.0854754	1	900	104%	95	105	0%	
Selenium	A	mg/L	0.79074	0.79074		0.8	0	0	0.0234201	0.1	225	99%	95	105	0%	
Silicon	A	mg/L	7.9941	7.9941		8	0	0	0.0487685	0.1	450	100%	95	105	0%	
Silver	A	mg/L	0.39386	0.39386		0.4	0	0	0.0055813	0.01	2	98%	95	105	0%	
Sodium	A	mg/L	41.36	41.36		40	0	0	0.1131395	1	450	103%	95	105	0%	
Strontium	A	mg/L	0.79655	0.79655		0.8	0	0	0.0002417	0.1	18	100%	95	105	0%	
Tellurium	A	mg/L	1.9908	1.9908		2	0	0	0.0301968	0.1	90	100%	95	105	0%	
Thallium	A	mg/L	0.76664	0.76664		0.8	0	0	0.0116401	0.5	225	96%	95	105	0%	
Tin	A	mg/L	0.77482	0.77482		0.8	0	0	0.0081865	0.1	225	97%	95	105	0%	
Titanium	A	mg/L	0.80198	0.80198		0.8	0	0	0.002716	0.01	225	100%	95	105	0%	
Uranium	A	mg/L	1.9825	1.9825		2	0	0	0.1154022	0.1154022	900	99%	95	105	0%	
Vanadium	A	mg/L	0.80438	0.80438		0.8	0	0	0.0036660	0.1	225	101%	95	105	0%	
Zinc	A	mg/L	0.78588	0.78588		0.8	0	0	0.0023364	0.01	90	98%	95	105	0%	
Silica	C	mg/L	17.1009787	17.1009787		17.1136	0	0	0.1043257	0.21392	100	100%	0	0	0%	S
Silicon as SiO2	C	mg/L	17.1009787	17.1009787		17.1136	0	0	0.1043257	0.21392	0	100%	0	0	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684020	ICSA	ICP-200.7-W-D	ICSA		2/6/2018 11:22:4	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	497.79	497.79		500	0	0	0.0133058	0.1	900	100%	80	120	0%	
Antimony	A	mg/L	0.01656	0.01656		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00312	0.00312		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00023	0.00023		0	0	0	0.0003929	0.1	18	0%	-0.005	0.0005	0%	
Beryllium	A	mg/L	0.00015	0.00015		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	-0.00961	-0.00961		0	0	0	0.0080048	0.1	450	0%	-0.1	0.1	0%	
Cadmium	A	mg/L	0.00216	0.00216		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	461.5	461.5		500	0	0	0.1126450	1	900	92%	80	120	0%	
Chromium	A	mg/L	-0.03323	-0.03323		0	0	0	0.0010626	0.05	225	0%	-0.01	0.01	0%	
Cobalt	A	mg/L	-0.00304	-0.00304		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00037	0.00037		0	0	0	0.0048764	0.01	225	0%	-0.01	0.01	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684020	ICSA	ICP-200.7-W-D	ICSA		2/6/2018 11:22:4	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Gold	A	mg/L	-0.01119	-0.01119		0	0	0	0.0189485	0.1	90	0%	-0.01	0.01	0%	
Iron	A	mg/L	179.74	179.74		200	0	0	0.1085536	0.1085536	1800	90%	80	120	0%	
Lead	A	mg/L	0.03847	0.03847		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.01573	0.01573		0	0	0	0.0059040	0.1	22.5	0%	-0.05	0.05	0%	
Magnesium	A	mg/L	504.37	504.37		500	0	0	0.0238838	1	4500	101%	80	120	0%	
Manganese	A	mg/L	-0.00733	-0.00733		0	0	0	0.0010649	0.01	45	0%	-0.01	0.01	0%	
Mercury	A	mg/L	0.00394	0.00394		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00543	0.00543		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0.00069	0.00069		0	0	0	0.0012530	0.05	225	0%	-0.05	0.05	0%	
Phosphorus	A	mg/L	-0.001	-0.001		0	0	0	0.0425464	0.1	360	0%	-0.1	0.1	0%	
Potassium	A	mg/L	0.03311	0.03311		0	0	0	0.0854754	1	900	0%	-1	1	0%	
Selenium	A	mg/L	-0.02497	-0.02497		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.03759	0.03759		0	0	0	0.0487685	0.1	450	0%	-0.1	0.1	0%	
Silver	A	mg/L	0.00165	0.00165		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.1135	0.1135		0	0	0	0.1131395	1	450	0%	-1	1	0%	
Strontium	A	mg/L	0.00418	0.00418		0	0	0	0.0002417	0.1	18	0%	-0.01	0.01	0%	
Tellurium	A	mg/L	0.01878	0.01878		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.0054	-0.0054		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	-0.00697	-0.00697		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00656	0.00656		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.15792	-0.15792		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.0051	0.0051		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00243	0.00243		0	0	0	0.0023364	0.01	90	0%	-0.01	0.01	0%	
Silica	C	mg/L	0.08041253	0.08041253		0	0	0	0.1043257	0.21392	100	0%	-0.1	0.1	0%	
Silicon as SiO2	C	mg/L	0.08041253	0.08041253		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684021	ICSAB	ICP-200.7-W-D	ICSAB		2/6/2018 11:27:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	490.21	490.21		500	0	0	0.0133058	0.1	900	98%	80	120	0%	
Antimony	A	mg/L	0.97646	0.97646		1	0	0	0.0356182	0.05	225	98%	80	120	0%	
Arsenic	A	mg/L	0.97514	0.97514		1	0	0	0.0231651	0.1	225	98%	80	120	0%	
Barium	A	mg/L	0.4692	0.4692		0.5	0	0	0.0003929	0.1	18	94%	80	120	0%	
Beryllium	A	mg/L	0.45591	0.45591		0.5	0	0	0.0002318	0.01	22.5	91%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
11684021	ICSAB	ICP-200.7-W-D	ICSAB		2/6/2018 11:27:0	1	R294307		0	0					

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.946	0.946		1	0	0	0.0080048	0.1	450	95%	80	120	0%	
Cadmium	A	mg/L	0.9302	0.9302		1	0	0	0.0010328	0.01	90	93%	80	120	0%	
Calcium	A	mg/L	458.03	458.03		500	0	0	0.1126450	1	900	92%	80	120	0%	
Chromium	A	mg/L	0.41218	0.41218		0.5	0	0	0.0010626	0.05	225	82%	80	120	0%	
Cobalt	A	mg/L	0.41932	0.41932		0.5	0	0	0.0033639	0.02	450	84%	80	120	0%	
Copper	A	mg/L	0.47905	0.47905		0.5	0	0	0.0048764	0.01	225	96%	80	120	0%	
Gold	A	mg/L	0.86936	0.86936		1	0	0	0.0189485	0.1	90	87%	80	120	0%	
Iron	A	mg/L	178.71	178.71		200	0	0	0.1085536	0.1085536	1800	89%	80	120	0%	
Lead	A	mg/L	0.89361	0.89361		1	0	0	0.0187623	0.05	900	89%	80	120	0%	
Lithium	A	mg/L	1.0481	1.0481		1	0	0	0.0059040	0.1	22.5	105%	80	120	0%	
Magnesium	A	mg/L	499.02	499.02		500	0	0	0.0238838	1	4500	100%	80	120	0%	
Manganese	A	mg/L	0.43869	0.43869		0.5	0	0	0.0010649	0.01	45	88%	80	120	0%	
Mercury	A	mg/L	0.36444	0.36444		0.4	0	0	0.0100947	0.02	45	91%	80	120	0%	
Molybdenum	A	mg/L	0.88969	0.88969		1	0	0	0.0031266	0.1	225	89%	80	120	0%	
Nickel	A	mg/L	0.83639	0.83639		1	0	0	0.0012530	0.05	225	84%	80	120	0%	
Phosphorus	A	mg/L	9.4658	9.4658		10	0	0	0.0425464	0.1	360	95%	80	120	0%	
Potassium	A	mg/L	20.363	20.363		20	0	0	0.0854754	1	900	102%	80	120	0%	
Selenium	A	mg/L	0.91978	0.91978		1	0	0	0.0234201	0.1	225	92%	80	120	0%	
Silicon	A	mg/L	9.7579	9.7579		10	0	0	0.0487685	0.1	450	98%	80	120	0%	
Silver	A	mg/L	0.95206	0.95206		1	0	0	0.0055813	0.01	2	95%	80	120	0%	
Sodium	A	mg/L	20.37	20.37		20	0	0	0.1131395	1	450	102%	80	120	0%	
Strontium	A	mg/L	0.94539	0.94539		1	0	0	0.0002417	0.1	18	95%	80	120	0%	
Tellurium	A	mg/L	0.9331	0.9331		1	0	0	0.0301968	0.1	90	93%	80	120	0%	
Thallium	A	mg/L	0.83741	0.83741		1	0	0	0.0116401	0.5	225	84%	80	120	0%	
Tin	A	mg/L	0.85077	0.85077		1	0	0	0.0081865	0.1	225	85%	80	120	0%	
Titanium	A	mg/L	0.93434	0.93434		1	0	0	0.002716	0.01	225	93%	80	120	0%	
Uranium	A	mg/L	0.90967	0.90967		1	0	0	0.0977495	0.1	900	91%	80	120	0%	
Vanadium	A	mg/L	0.45988	0.45988		0.5	0	0	0.0036660	0.1	225	92%	80	120	0%	
Zinc	A	mg/L	0.92375	0.92375		1	0	0	0.0023364	0.01	90	92%	80	120	0%	
Silica	C	mg/L	20.8740997	20.8740997		21.392	0	0	0.1043257	0.21392	100	98%	80	120	0%	
Silicon as SiO2	C	mg/L	20.8740997	20.8740997		21.392	0	0	0.1043257	0.21392	0	98%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684555	MB-7400DIS18	ICP-6010-W-D	MBLK		2/6/2018 11:08:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.00202	0		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.0001	0		0	0	0	0.0356182	0.0356182	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00229	0		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00017	0		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00007	0		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	-0.00066	0		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	-0.00004	0		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00348	0		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00066	0		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	-0.00005	0		0	0	0	0.0033639	0.021	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	-0.00052	0		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00315	0		0	0	0	0.0189485	0.02	90	0%	0	0	0%	
Iron	A	mg/L	-0.00052	0		0	0	0	0.0250321	0.03	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00562	0		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	-0.00011	0		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00034	0		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	-0.00001	0		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Molybdenum	A	mg/L	0.00077	0		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00027	0		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.003	0		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	-0.00002	0		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00174	0		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.02472	0		0	0	0	0.0487685	0.05	450	0%	0	0	0%	
Silver	A	mg/L	0.00021	0		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0675	0		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00002	0		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.0115	0		0	0	0	0.0301968	1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00174	0		0	0	0	0.0116401	0.0116401	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	0.00143	0		0	0	0	0.0081865	0.0081865	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00038	0		0	0	0	0.002716	0.002716	225	0%	-0.01	0.1	0%	
Uranium	A	mg/L	-0.06927	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00004	0		0	0	0	0.0036660	0.1	225	0%	-0.01	0.1	0%	
Zinc	A	mg/L	-0.00001	0		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silicon as SiO2	C	mg/L	0.0529008	0		0	0	0	0.1043647	0.107	100	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684556	LLRV	ICP-6010-W-D	CRI		2/6/2018 11:12:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.10542	0.10542		0.1	0	0	0.0066084	0.1	18	105%	80	120	0%	
Antimony	A	mg/L	0.19639	0.19639		0.2	0	0	0.0356182	0.0356182	225	98%	80	120	0%	
Arsenic	A	mg/L	0.20847	0.20847		0.2	0	0	0.0231651	0.1	225	104%	80	120	0%	
Barium	A	mg/L	0.00304	0.00304		0.003	0	0	0.0003929	0.1	18	101%	80	120	0%	
Beryllium	A	mg/L	0.00208	0.00208		0.002	0	0	0.0002318	0.01	22.5	104%	80	120	0%	
Boron	A	mg/L	0.05026	0.05026		0.05	0	0	0.0080048	0.1	450	101%	80	120	0%	
Cadmium	A	mg/L	0.00487	0.00487		0.005	0	0	0.0010328	0.01	90	97%	80	120	0%	
Calcium	A	mg/L	0.32409	0.32409		0.3	0	0	0.1071422	1	180	108%	80	120	0%	
Chromium	A	mg/L	0.0412	0.0412		0.04	0	0	0.0010626	0.05	225	103%	80	120	0%	
Cobalt	A	mg/L	0.03091	0.03091		0.03	0	0	0.0033639	0.021	450	103%	80	120	0%	
Copper	A	mg/L	0.05229	0.05229		0.05	0	0	0.0048764	0.01	225	105%	80	120	0%	
Gold	A	mg/L	0.19856	0.19856		0.2	0	0	0.0189485	0.02	90	99%	80	120	0%	
Iron	A	mg/L	0.03079	0.03079		0.03	0	0	0.0250321	0.03	360	103%	80	120	0%	
Lead	A	mg/L	0.19804	0.19804		0.2	0	0	0.0187623	0.05	900	99%	80	120	0%	
Lithium	A	mg/L	0.05543	0.05543		0.05	0	0	0.0059040	0.1	22.5	111%	80	120	0%	
Magnesium	A	mg/L	0.08589	0.08589		0.08	0	0	0.0116555	1	180	107%	80	120	0%	
Manganese	A	mg/L	0.00487	0.00487		0.005	0	0	0.0010649	0.01	45	97%	80	120	0%	
Molybdenum	A	mg/L	0.0393	0.0393		0.04	0	0	0.0031266	0.1	225	98%	80	120	0%	
Nickel	A	mg/L	0.0302	0.0302		0.03	0	0	0.0012530	0.05	225	101%	80	120	0%	
Phosphorus	A	mg/L	0.39751	0.39751		0.4	0	0	0.0425464	0.1	360	99%	80	120	0%	
Potassium	A	mg/L	0.53687	0.53687		0.5	0	0	0.0854754	1	900	107%	80	120	0%	
Selenium	A	mg/L	0.3081	0.3081		0.3	0	0	0.0234201	0.1	225	103%	80	120	0%	
Silicon	A	mg/L	0.30871	0.30871		0.3	0	0	0.0487685	0.05	450	103%	80	120	0%	
Silver	A	mg/L	0.05204	0.05204		0.05	0	0	0.0055813	0.01	2	104%	80	120	0%	
Sodium	A	mg/L	0.3968	0.3968		0.3	0	0	0.1131395	1	450	132%	80	120	0%	S
Strontium	A	mg/L	0.00207	0.00207		0.002	0	0	0.0002417	0.1	18	103%	80	120	0%	
Tellurium	A	mg/L	0.22137	0.22137		0.2	0	0	0.0301968	1	90	111%	80	120	0%	
Thallium	A	mg/L	0.20121	0.20121		0.2	0	0	0.0116401	0.0116401	225	101%	80	120	0%	
Tin	A	mg/L	0.10445	0.10445		0.1	0	0	0.0081865	0.0081865	225	104%	80	120	0%	
Titanium	A	mg/L	0.02067	0.02067		0.02	0	0	0.002716	0.002716	225	103%	80	120	0%	
Uranium	A	mg/L	0.98336	0.98336		1	0	0	0.1154022	0.1154022	900	98%	80	120	0%	
Vanadium	A	mg/L	0.05019	0.05019		0.05	0	0	0.0036660	0.1	225	100%	80	120	0%	
Zinc	A	mg/L	0.02086	0.02086		0.02	0	0	0.0023364	0.01	90	104%	80	120	0%	
Silicon as SiO2	C	mg/L	0.6606394	0.6606394		0	0	0	0.1043647	0.107	100	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684557	LFB-7400DIS18	ICP-6010-W-D	LFB		2/6/2018 11:15:5	1.03	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.70990291	4.8512		5	0	0	0.0068066	0.1	18	97%	80	120	0%	
Antimony	A	mg/L	0.96086408	0.98969		1	0	0	0.0366867	0.0366867	225	99%	80	120	0%	
Arsenic	A	mg/L	0.97087379	1		1	0	0	0.0238601	0.1	225	100%	80	120	0%	
Barium	A	mg/L	0.97203883	1.0012		1	0	0	0.0004047	0.1	18	100%	80	120	0%	
Beryllium	A	mg/L	0.48584466	0.50042		0.5	0	0	0.0002387	0.01	22.5	100%	80	120	0%	
Boron	A	mg/L	0.97262136	1.0018		1	0	0	0.008245	0.1	450	100%	80	120	0%	
Cadmium	A	mg/L	0.47867961	0.49304		0.5	0	0	0.0010638	0.01	90	99%	80	120	0%	
Calcium	A	mg/L	49.5145631	51		50	0	0	0.1103565	1	180	102%	80	120	0%	
Chromium	A	mg/L	0.95760194	0.98633		1	0	0	0.0010945	0.05	225	99%	80	120	0%	
Cobalt	A	mg/L	0.93635922	0.96445		1	0	0	0.0034648	0.021	450	96%	80	120	0%	
Copper	A	mg/L	0.95516505	0.98382		1	0	0	0.0050227	0.01	225	98%	80	120	0%	
Gold	A	mg/L	0.91762136	0.94515		1	0	0	0.019517	0.02	90	95%	80	120	0%	
Iron	A	mg/L	4.96572816	5.1147		5	0	0	0.0257830	0.03	360	102%	80	120	0%	
Lead	A	mg/L	0.93598058	0.96406		1	0	0	0.0193251	0.05	900	96%	80	120	0%	
Lithium	A	mg/L	1.00019417	1.0302		1	0	0	0.0060811	0.1	22.5	103%	80	120	0%	
Magnesium	A	mg/L	49.415534	50.898		50	0	0	0.0120051	1	180	102%	80	120	0%	
Manganese	A	mg/L	4.74766990	4.8901		5	0	0	0.0010968	0.01	45	98%	80	120	0%	
Molybdenum	A	mg/L	0.94225243	0.97052		1	0	0	0.0032204	0.1	225	97%	80	120	0%	
Nickel	A	mg/L	0.93642718	0.96452		1	0	0	0.0012906	0.05	225	96%	80	120	0%	
Phosphorus	A	mg/L	9.86407767	10.16		10	0	0	0.0438228	0.1	360	102%	80	120	0%	
Potassium	A	mg/L	49.8864078	51.383		50	0	0	0.0880397	1	900	103%	80	120	0%	
Selenium	A	mg/L	0.95629126	0.98498		1	0	0	0.0241227	0.1	225	98%	80	120	0%	
Silicon	A	mg/L	9.68368932	9.9742		10	0	0	0.0502316	0.0502316	450	100%	80	120	0%	
Silver	A	mg/L	0.46815534	0.4822		0.5	0	0	0.0057488	0.01	2	96%	80	120	0%	
Sodium	A	mg/L	49.5922330	51.08		50	0	0	0.1165337	1	450	102%	80	120	0%	
Strontium	A	mg/L	0.9625534	0.99143		1	0	0	0.0002489	0.1	18	99%	80	120	0%	
Tellurium	A	mg/L	0.97427184	1.0035		1	0	0	0.0311027	1	90	100%	80	120	0%	
Thallium	A	mg/L	0.93453398	0.96257		1	0	0	0.0119893	0.0119893	225	96%	80	120	0%	
Tin	A	mg/L	0.93247573	0.96045		1	0	0	0.0084321	0.0084321	225	96%	80	120	0%	
Titanium	A	mg/L	0.9578835	0.98662		1	0	0	0.0027974	0.0027974	225	99%	80	120	0%	
Uranium	A	mg/L	0.91694175	0.94445		1	0	0	0.1188643	0.1188643	900	94%	80	120	0%	
Vanadium	A	mg/L	0.97078641	0.99991		1	0	0	0.003776	0.1	225	100%	80	120	0%	
Zinc	A	mg/L	0.95603883	0.98472		1	0	0	0.0024065	0.01	90	98%	80	120	0%	
Silicon as SiO2	C	mg/L	20.7230951	21.344788		21.392	0	0	0.1074956	0.1074956	100	100%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684558	QCS	ICP-6010-W-D	ICV		2/6/2018 11:19:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	3.9158	3.9158		4	0	0	0.0066084	0.1	18	98%	90	110	0%	
Antimony	A	mg/L	0.80314	0.80314		0.8	0	0	0.0356182	0.0356182	225	100%	90	110	0%	
Arsenic	A	mg/L	0.79785	0.79785		0.8	0	0	0.0231651	0.1	225	100%	90	110	0%	
Barium	A	mg/L	0.80181	0.80181		0.8	0	0	0.0003929	0.1	18	100%	90	110	0%	
Beryllium	A	mg/L	0.40097	0.40097		0.4	0	0	0.0002318	0.01	22.5	100%	90	110	0%	
Boron	A	mg/L	0.81028	0.81028		0.8	0	0	0.0080048	0.1	450	101%	90	110	0%	
Cadmium	A	mg/L	0.3932	0.3932		0.4	0	0	0.0010328	0.01	90	98%	90	110	0%	
Calcium	A	mg/L	40.433	40.433		40	0	0	0.1071422	1	180	101%	90	110	0%	
Chromium	A	mg/L	0.7894	0.7894		0.8	0	0	0.0010626	0.05	225	99%	90	110	0%	
Cobalt	A	mg/L	0.77001	0.77001		0.8	0	0	0.0033639	0.021	450	96%	90	110	0%	
Copper	A	mg/L	0.7942	0.7942		0.8	0	0	0.0048764	0.01	225	99%	90	110	0%	
Gold	A	mg/L	1.9366	1.9366		2	0	0	0.0189485	0.02	90	97%	90	110	0%	
Iron	A	mg/L	4.1182	4.1182		4	0	0	0.0250321	0.03	360	103%	90	110	0%	
Lead	A	mg/L	0.77565	0.77565		0.8	0	0	0.0187623	0.05	900	97%	90	110	0%	
Lithium	A	mg/L	0.83399	0.83399		0.8	0	0	0.0059040	0.1	22.5	104%	90	110	0%	
Magnesium	A	mg/L	40.88	40.88		40	0	0	0.0116555	1	180	102%	90	110	0%	
Manganese	A	mg/L	3.9249	3.9249		4	0	0	0.0010649	0.01	45	98%	90	110	0%	
Molybdenum	A	mg/L	0.78287	0.78287		0.8	0	0	0.0031266	0.1	225	98%	90	110	0%	
Nickel	A	mg/L	0.77215	0.77215		0.8	0	0	0.0012530	0.05	225	97%	90	110	0%	
Phosphorus	A	mg/L	8.1244	8.1244		8	0	0	0.0425464	0.1	360	102%	90	110	0%	
Potassium	A	mg/L	41.519	41.519		40	0	0	0.0854754	1	900	104%	90	110	0%	
Selenium	A	mg/L	0.79074	0.79074		0.8	0	0	0.0234201	0.1	225	99%	90	110	0%	
Silicon	A	mg/L	7.9941	7.9941		8	0	0	0.0487685	0.05	450	100%	90	110	0%	
Silver	A	mg/L	0.39386	0.39386		0.4	0	0	0.0055813	0.01	2	98%	90	110	0%	
Sodium	A	mg/L	41.36	41.36		40	0	0	0.1131395	1	450	103%	90	110	0%	
Strontium	A	mg/L	0.79655	0.79655		0.8	0	0	0.0002417	0.1	18	100%	90	110	0%	
Tellurium	A	mg/L	1.9908	1.9908		2	0	0	0.0301968	1	90	100%	90	110	0%	
Thallium	A	mg/L	0.76664	0.76664		0.8	0	0	0.0116401	0.0116401	225	96%	90	110	0%	
Tin	A	mg/L	0.77482	0.77482		0.8	0	0	0.0081865	0.0081865	225	97%	90	110	0%	
Titanium	A	mg/L	0.80198	0.80198		0.8	0	0	0.002716	0.002716	225	100%	90	110	0%	
Uranium	A	mg/L	1.9825	1.9825		2	0	0	0.1154022	0.1154022	900	99%	90	110	0%	
Vanadium	A	mg/L	0.80438	0.80438		0.8	0	0	0.0036660	0.1	225	101%	90	110	0%	
Zinc	A	mg/L	0.78588	0.78588		0.8	0	0	0.0023364	0.01	90	98%	90	110	0%	
Silicon as SiO2	C	mg/L	17.107374	17.107374		8	0	0	0.1043647	0.107	100	214%	0	0	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684559	ICSA	ICP-6010-W-D	ICSA		2/6/2018 11:22:4	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	497.79	497.79		500	0	0	0.0133058	0.1	900	100%	80	120	0%	
Antimony	A	mg/L	0.01656	0.01656		0	0	0	0.0356182	0.0356182	225	0%			0%	
Arsenic	A	mg/L	0.00312	0.00312		0	0	0	0.0231651	0.1	225	0%			0%	
Barium	A	mg/L	0.00023	0.00023		0	0	0	0.0003929	0.1	18	0%			0%	
Beryllium	A	mg/L	0.00015	0.00015		0	0	0	0.0002318	0.01	22.5	0%			0%	
Boron	A	mg/L	-0.00961	-0.00961		0	0	0	0.0080048	0.1	450	0%			0%	
Cadmium	A	mg/L	0.00216	0.00216		0	0	0	0.0010328	0.01	90	0%			0%	
Calcium	A	mg/L	461.5	461.5		500	0	0	0.1126450	1	900	92%	80	120	0%	
Chromium	A	mg/L	-0.03323	-0.03323		0	0	0	0.0010626	0.05	225	0%			0%	
Cobalt	A	mg/L	-0.00304	-0.00304		0	0	0	0.0033639	0.021	450	0%			0%	
Copper	A	mg/L	0.00037	0.00037		0	0	0	0.0048764	0.01	225	0%			0%	
Gold	A	mg/L	-0.01119	-0.01119		0	0	0	0.0189485	0.02	90	0%			0%	
Iron	A	mg/L	179.74	179.74		200	0	0	0.1085536	0.1085536	1800	90%	80	120	0%	
Lead	A	mg/L	0.03847	0.03847		0	0	0	0.0187623	0.05	900	0%			0%	
Lithium	A	mg/L	0.01573	0.01573		0	0	0	0.0059040	0.1	22.5	0%			0%	
Magnesium	A	mg/L	504.37	504.37		500	0	0	0.0238838	1	4500	101%	80	120	0%	
Manganese	A	mg/L	-0.00733	-0.00733		0	0	0	0.0010649	0.01	45	0%			0%	
Molybdenum	A	mg/L	0.00543	0.00543		0	0	0	0.0031266	0.1	225	0%			0%	
Nickel	A	mg/L	0.00069	0.00069		0	0	0	0.0012530	0.05	225	0%			0%	
Phosphorus	A	mg/L	-0.001	-0.001		0	0	0	0.0425464	0.1	360	0%			0%	
Potassium	A	mg/L	0.03311	0.03311		0	0	0	0.0854754	1	900	0%			0%	
Selenium	A	mg/L	-0.02497	-0.02497		0	0	0	0.0234201	0.1	225	0%			0%	
Silicon	A	mg/L	0.03759	0.03759		0	0	0	0.0487685	0.05	450	0%			0%	
Silver	A	mg/L	0.00165	0.00165		0	0	0	0.0055813	0.01	2	0%			0%	
Sodium	A	mg/L	0.1135	0.1135		0	0	0	0.1131395	1	450	0%			0%	
Strontium	A	mg/L	0.00418	0.00418		0	0	0	0.0002417	0.1	18	0%			0%	
Tellurium	A	mg/L	0.01878	0.01878		0	0	0	0.0301968	1	90	0%			0%	
Thallium	A	mg/L	-0.0054	-0.0054		0	0	0	0.0116401	0.0116401	225	0%			0%	
Tin	A	mg/L	-0.00697	-0.00697		0	0	0	0.0081865	0.0081865	225	0%			0%	
Titanium	A	mg/L	0.00656	0.00656		0	0	0	0.002716	0.002716	225	0%			0%	
Uranium	A	mg/L	-0.15792	-0.15792		0	0	0	0.1154022	0.1154022	900	0%			0%	
Vanadium	A	mg/L	0.0051	0.0051		0	0	0	0.0036660	0.1	225	0%			0%	
Zinc	A	mg/L	0.00243	0.00243		0	0	0	0.0023364	0.01	90	0%			0%	
Silicon as SiO2	C	mg/L	0.0804426	0.0804426		0	0	0	0.1043647	0.107	100	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684560	ICSAB	ICP-6010-W-D	ICSAB		2/6/2018 11:27:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	490.21	490.21		500	0	0	0.0133058	0.1	900	98%	80	120	0%	
Antimony	A	mg/L	0.97646	0.97646		1	0	0	0.0356182	0.0356182	225	98%	80	120	0%	
Arsenic	A	mg/L	0.97514	0.97514		1	0	0	0.0231651	0.1	225	98%	80	120	0%	
Barium	A	mg/L	0.4692	0.4692		0.5	0	0	0.0003929	0.1	18	94%	80	120	0%	
Beryllium	A	mg/L	0.45591	0.45591		0.5	0	0	0.0002318	0.01	22.5	91%	80	120	0%	
Boron	A	mg/L	0.946	0.946		1	0	0	0.0080048	0.1	450	95%	80	120	0%	
Cadmium	A	mg/L	0.9302	0.9302		1	0	0	0.0010328	0.01	90	93%	80	120	0%	
Calcium	A	mg/L	458.03	458.03		500	0	0	0.1126450	1	900	92%	80	120	0%	
Chromium	A	mg/L	0.41218	0.41218		0.5	0	0	0.0010626	0.05	225	82%	80	120	0%	
Cobalt	A	mg/L	0.41932	0.41932		0.5	0	0	0.0033639	0.021	450	84%	80	120	0%	
Copper	A	mg/L	0.47905	0.47905		0.5	0	0	0.0048764	0.01	225	96%	80	120	0%	
Gold	A	mg/L	0.86936	0.86936		1	0	0	0.0189485	0.02	90	87%	80	120	0%	
Iron	A	mg/L	178.71	178.71		200	0	0	0.1085536	0.1085536	1800	89%	80	120	0%	
Lead	A	mg/L	0.89361	0.89361		1	0	0	0.0187623	0.05	900	89%	80	120	0%	
Lithium	A	mg/L	1.0481	1.0481		1	0	0	0.0059040	0.1	22.5	105%	80	120	0%	
Magnesium	A	mg/L	499.02	499.02		500	0	0	0.0238838	1	4500	100%	80	120	0%	
Manganese	A	mg/L	0.43869	0.43869		0.5	0	0	0.0010649	0.01	45	88%	80	120	0%	
Molybdenum	A	mg/L	0.88969	0.88969		1	0	0	0.0031266	0.1	225	89%	80	120	0%	
Nickel	A	mg/L	0.83639	0.83639		1	0	0	0.0012530	0.05	225	84%	80	120	0%	
Phosphorus	A	mg/L	9.4658	9.4658		10	0	0	0.0425464	0.1	360	95%	80	120	0%	
Potassium	A	mg/L	20.363	20.363		20	0	0	0.0854754	1	900	102%	80	120	0%	
Selenium	A	mg/L	0.91978	0.91978		1	0	0	0.0234201	0.1	225	92%	80	120	0%	
Silicon	A	mg/L	9.7579	9.7579		10	0	0	0.0487685	0.05	450	98%	80	120	0%	
Silver	A	mg/L	0.95206	0.95206		1	0	0	0.0055813	0.01	2	95%	80	120	0%	
Sodium	A	mg/L	20.37	20.37		20	0	0	0.1131395	1	450	102%	80	120	0%	
Strontium	A	mg/L	0.94539	0.94539		1	0	0	0.0002417	0.1	18	95%	80	120	0%	
Tellurium	A	mg/L	0.9331	0.9331		1	0	0	0.0301968	1	90	93%	80	120	0%	
Thallium	A	mg/L	0.83741	0.83741		1	0	0	0.0116401	0.0116401	225	84%	80	120	0%	
Tin	A	mg/L	0.85077	0.85077		1	0	0	0.0081865	0.0081865	225	85%	80	120	0%	
Titanium	A	mg/L	0.93434	0.93434		1	0	0	0.002716	0.002716	225	93%	80	120	0%	
Uranium	A	mg/L	0.90967	0.90967		1	0	0	0.0977495	0.0977495	900	91%	80	120	0%	
Vanadium	A	mg/L	0.45988	0.45988		0.5	0	0	0.0036660	0.1	225	92%	80	120	0%	
Zinc	A	mg/L	0.92375	0.92375		1	0	0	0.0023364	0.01	90	92%	80	120	0%	
Silicon as SiO2	C	mg/L	20.881906	20.881906		0	0	0	0.1043647	0.107	100	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684561	ULR1	ICP-6010-W-D	ULR1		2/6/2018 11:31:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	101.07	101.07		100	0	0	0.0133058	0.1	900	101%	90	110	0%	
Antimony	A	mg/L	96.628	96.628		100	0	0	0.0356182	0.0356182	225	97%	90	110	0%	
Arsenic	A	mg/L	0.05214	0.05214		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	mg/L	98.731	98.731		100	0	0	0.0707737	0.1	450	99%	90	110	0%	
Beryllium	A	mg/L	0.01395	0.01395		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	mg/L	95.179	95.179		100	0	0	0.0080048	0.1	450	95%	90	110	0%	
Cadmium	A	mg/L	-0.00046	0		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	mg/L	0.10494	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	97.597	97.597		100	0	0	0.0149313	0.05	900	98%	90	110	0%	
Cobalt	A	mg/L	-0.00831	0		0	0	0	0.0033639	0.021	450	0%	0	0	0%	
Copper	A	mg/L	97.257	97.257		100	0	0	0.0048764	0.01	225	97%	90	110	0%	
Gold	A	mg/L	0.01738	0		0	0	0	0.0189485	0.02	90	0%	0	0	0%	
Iron	A	mg/L	0.03574	0.03574		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Lead	A	mg/L	0.0417	0.0417		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Lithium	A	mg/L	-0.00029	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.06363	0.06363		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	-0.00126	0		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	mg/L	95.18	95.18		100	0	0	0.0127167	0.1	225	95%	90	110	0%	
Nickel	A	mg/L	92.715	92.715		100	0	0	0.0012530	0.05	225	93%	90	110	0%	
Phosphorus	A	mg/L	0.04457	0.04457		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	-0.01159	0		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	mg/L	-0.01698	0		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	mg/L	190.51	190.51		200	0	0	0.0487685	0.05	450	95%	90	110	0%	
Silver	A	mg/L	-0.0224	0		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	mg/L	0.0634	0		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	mg/L	0.00072	0.00072		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tellurium	A	mg/L	0.23864	0.23864		0	0	0	0.0301968	1	90	0%	0	0	0%	
Thallium	A	mg/L	94.746	94.746		100	0	0	0.0116401	0.0116401	225	95%	90	110	0%	
Tin	A	mg/L	93.342	93.342		100	0	0	0.0081865	0.0081865	225	93%	90	110	0%	
Titanium	A	mg/L	94.742	94.742		100	0	0	0.002716	0.002716	225	95%	90	110	0%	
Uranium	A	mg/L	0.0159	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.03935	0.03935		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	mg/L	-0.02343	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	407.6914	407.6914		0	0	0	0.1043647	0.107	100	0%	0	0	0%	
Uranium, Activity	C	mg/L	10.7643	0		0	0	0	78.127319	78.127319	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684562	ULR2	ICP-6010-W-D	ULR2		2/6/2018 11:35:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00352	0		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Antimony	A	mg/L	0.00159	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Arsenic	A	mg/L	97.078	97.078		100	0	0	0.0231651	0.1	225	97%	90	110	0%	
Barium	A	mg/L	0.02716	0.02716		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	18.115	18.115		50	0	0	0.0002246	0.01	22.5	36%	90	110	0%	S
Boron	A	mg/L	0.04379	0.04379		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	mg/L	93.903	93.903		100	0	0	0.0010328	0.01	90	94%	90	110	0%	
Calcium	A	mg/L	0.05686	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.02534	0.02534		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	mg/L	93.875	93.875		100	0	0	0.0033639	0.021	450	94%	90	110	0%	
Copper	A	mg/L	0.01737	0.01737		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	mg/L	-0.30574	0		0	0	0	0.0189485	0.02	90	0%	0	0	0%	
Iron	A	mg/L	0.03101	0.03101		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Lead	A	mg/L	100.13	100.13		100	0	0	0.0187623	0.05	900	100%	90	110	0%	
Lithium	A	mg/L	-0.00008	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	-0.01224	0		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	101.67	101.67		100	0	0	0.0949671	0.0949671	900	102%	90	110	0%	
Molybdenum	A	mg/L	0.02293	0.02293		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Nickel	A	mg/L	0.0002	0		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.02197	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.01772	0		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	mg/L	96.918	96.918		100	0	0	0.0234201	0.1	225	97%	90	110	0%	
Silicon	A	mg/L	0.12885	0.12885		0	0	0	0.0487685	0.05	450	0%	0	0	0%	
Silver	A	mg/L	-0.00303	0		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	mg/L	0.0739	0		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	mg/L	95.924	95.924		100	0	0	0.0034195	0.1	225	96%	90	110	0%	
Tellurium	A	mg/L	-0.088	0		0	0	0	0.0301968	1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00053	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	A	mg/L	0.00749	0		0	0	0	0.0081865	0.0081865	225	0%	0	0	0%	
Titanium	A	mg/L	0.00957	0.00957		0	0	0	0.002716	0.002716	225	0%	0	0	0%	
Uranium	A	mg/L	0.17191	0.17191		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	96.99	96.99		100	0	0	0.0036660	0.1	225	97%	90	110	0%	
Zinc	A	mg/L	98.719	98.719		100	0	0	0.1140630	0.1140630	900	99%	90	110	0%	
Silicon as SiO2	C	mg/L	0.275739	0.275739		0	0	0	0.1043647	0.107	100	0%	0	0	0%	
Uranium, Activity	C	mg/L	116.38307	116.38307		0	0	0	78.127319	78.127319	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684563	ULR3	ICP-6010-W-D	ULR3		2/6/2018 11:39:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.00009	0		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Antimony	A	mg/L	0.00326	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Arsenic	A	mg/L	0.00905	0		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	mg/L	0.00079	0.00079		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00475	0.00475		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	mg/L	0.01309	0.01309		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00339	0.00339		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	mg/L	0.02434	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00031	0		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00358	0.00358		0	0	0	0.0033639	0.021	450	0%	0	0	0%	
Copper	A	mg/L	0.00067	0		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	mg/L	0.00271	0		0	0	0	0.0189485	0.02	90	0%	0	0	0%	
Iron	A	mg/L	0.00398	0		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Lead	A	mg/L	0.0055	0		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Lithium	A	mg/L	0.00047	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.0052	0		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	0.00984	0.00984		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	mg/L	0.00412	0.00412		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Nickel	A	mg/L	0.00003	0		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	mg/L	519.68	519.68		500	0	0	0.0591595	0.1	900	104%	90	110	0%	
Potassium	A	mg/L	917.69	917.69		1000	0	0	0.8306842	1	450	92%	90	110	0%	
Selenium	A	mg/L	0.00549	0		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	mg/L	0.01614	0		0	0	0	0.0487685	0.05	450	0%	0	0	0%	
Silver	A	mg/L	0.00044	0		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	mg/L	958.09	958.09		1000	0	0	0.2209136	1	4500	96%	90	110	0%	
Strontium	A	mg/L	0.00942	0.00942		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tellurium	A	mg/L	0.0169	0		0	0	0	0.0301968	1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00656	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	A	mg/L	0.00028	0		0	0	0	0.0081865	0.0081865	225	0%	0	0	0%	
Titanium	A	mg/L	0.00109	0		0	0	0	0.002716	0.002716	225	0%	0	0	0%	
Uranium	A	mg/L	-0.04963	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.01012	0.01012		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	mg/L	0.00552	0.00552		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0345396	0		0	0	0	0.1043647	0.107	100	0%	0	0	0%	
Uranium, Activity	C	mg/L	-33.59951	0		0	0	0	78.127319	78.127319	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684564	RINSE	ICP-6010-W-D	SAMP		2/6/2018 11:43:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	A	mg/L	-0.00225	0		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	mg/L	0.00002	0		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00033	0.00033		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	J
Boron	A	mg/L	0.00684	0		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00061	0		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	mg/L	0.00316	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.0002	0		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00034	0		0	0	0	0.0033639	0.021	450	0%	0	0	0%	
Copper	A	mg/L	-0.00036	0		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	mg/L	-0.00414	0		0	0	0	0.0189485	0.02	90	0%	0	0	0%	
Iron	A	mg/L	0.00113	0		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Lead	A	mg/L	0.00154	0		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Lithium	A	mg/L	0.00079	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.00106	0		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	0.00056	0		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	mg/L	0.00105	0		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Nickel	A	mg/L	0.00016	0		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.0213	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.20931	0.20931		0	0	0	0.0854754	1	900	0%	0	0	0%	J
Selenium	A	mg/L	0.00344	0		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	mg/L	0.01597	0		0	0	0	0.0487685	0.05	450	0%	0	0	0%	
Silver	A	mg/L	-0.00013	0		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	mg/L	0.2847	0.2847		0	0	0	0.1131395	1	450	0%	0	0	0%	J
Strontium	A	mg/L	0.00049	0.00049		0	0	0	0.0002417	0.1	18	0%	0	0	0%	J
Tellurium	A	mg/L	0.01026	0		0	0	0	0.0301968	1	90	0%	0	0	0%	
Vanadium	A	mg/L	-0.00014	0		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	mg/L	0.00054	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	0.00198	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Thallium	B	mg/L	0.00237	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	B	mg/L	0.00215	0		0	0	0	0.0081865	0.0081865	225	0%	0	0	0%	
Titanium	B	mg/L	0.00041	0		0	0	0	0.002716	0.002716	225	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0341758	0		0	0	0	0.1043647	0.107	100	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684565	CCV	ICP-200.7-W-D	CCV		2/6/2018 11:47:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5465	2.5465		2.5	0	0	0.0066084	0.1	18	102%	90	110	0%	
Antimony	A	mg/L	2.5223	2.5223		2.5	0	0	0.0356182	0.05	225	101%	90	110	0%	
Arsenic	A	mg/L	2.5378	2.5378		2.5	0	0	0.0231651	0.1	225	102%	90	110	0%	
Barium	A	mg/L	2.5221	2.5221		2.5	0	0	0.0003929	0.1	18	101%	90	110	0%	
Beryllium	A	mg/L	1.2612	1.2612		1.25	0	0	0.0002318	0.01	22.5	101%	90	110	0%	
Boron	A	mg/L	2.5126	2.5126		2.5	0	0	0.0080048	0.1	450	101%	90	110	0%	
Cadmium	A	mg/L	2.4912	2.4912		2.5	0	0	0.0010328	0.01	90	100%	90	110	0%	
Calcium	A	mg/L	26.149	26.149		25	0	0	0.1071422	1	180	105%	90	110	0%	
Chromium	A	mg/L	2.5263	2.5263		2.5	0	0	0.0010626	0.05	225	101%	90	110	0%	
Cobalt	A	mg/L	2.4714	2.4714		2.5	0	0	0.0033639	0.02	450	99%	90	110	0%	
Copper	A	mg/L	2.501	2.501		2.5	0	0	0.0048764	0.01	225	100%	90	110	0%	
Gold	A	mg/L	2.5012	2.5012		2.5	0	0	0.0189485	0.1	90	100%	90	110	0%	
Iron	A	mg/L	2.6229	2.6229		2.5	0	0	0.0250321	0.0250321	360	105%	90	110	0%	
Lead	A	mg/L	2.4757	2.4757		2.5	0	0	0.0187623	0.05	900	99%	90	110	0%	
Lithium	A	mg/L	1.2886	1.2886		1.25	0	0	0.0059040	0.1	22.5	103%	90	110	0%	
Magnesium	A	mg/L	26.014	26.014		25	0	0	0.0116555	1	180	104%	90	110	0%	
Manganese	A	mg/L	2.4739	2.4739		2.5	0	0	0.0010649	0.01	45	99%	90	110	0%	
Mercury	A	mg/L	1.0298	1.0298		1	0	0	0.0100947	0.02	45	103%	90	110	0%	
Molybdenum	A	mg/L	2.5073	2.5073		2.5	0	0	0.0031266	0.1	225	100%	90	110	0%	
Nickel	A	mg/L	2.4826	2.4826		2.5	0	0	0.0012530	0.05	225	99%	90	110	0%	
Phosphorus	A	mg/L	2.5683	2.5683		2.5	0	0	0.0425464	0.1	360	103%	90	110	0%	
Potassium	A	mg/L	25.951	25.951		25	0	0	0.0854754	1	900	104%	90	110	0%	
Selenium	A	mg/L	2.504	2.504		2.5	0	0	0.0234201	0.1	225	100%	90	110	0%	
Silicon	A	mg/L	5.102	5.102		5	0	0	0.0487685	0.1	450	102%	90	110	0%	
Silver	A	mg/L	1.0194	1.0194		1	0	0	0.0055813	0.01	2	102%	90	110	0%	
Sodium	A	mg/L	25.87	25.87		25	0	0	0.1131395	1	450	103%	90	110	0%	
Strontium	A	mg/L	2.485	2.485		2.5	0	0	0.0002417	0.1	18	99%	90	110	0%	
Tellurium	A	mg/L	2.5203	2.5203		2.5	0	0	0.0301968	0.1	90	101%	90	110	0%	
Thallium	A	mg/L	2.4766	2.4766		2.5	0	0	0.0116401	0.5	225	99%	90	110	0%	
Tin	A	mg/L	2.4772	2.4772		2.5	0	0	0.0081865	0.1	225	99%	90	110	0%	
Titanium	A	mg/L	2.4964	2.4964		2.5	0	0	0.002716	0.01	225	100%	90	110	0%	
Uranium	A	mg/L	2.4532	2.4532		2.5	0	0	0.1154022	0.1154022	900	98%	90	110	0%	
Vanadium	A	mg/L	2.5263	2.5263		2.5	0	0	0.0036660	0.1	225	101%	90	110	0%	
Zinc	A	mg/L	2.4904	2.4904		2.5	0	0	0.0023364	0.01	90	100%	90	110	0%	
Silica	C	mg/L	10.9141984	10.9141984		10.7	0	0	0.1043257	0.21392	100	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684565	CCV	ICP-200.7-W-D	CCV		2/6/2018 11:47:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	10.9141984	10.9141984		10.7	0	0	0.1043257	0.21392	0	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684566	CCB	ICP-200.7-W-D	CCB		2/6/2018 11:51:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00014	0.00014		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.00422	-0.00422		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00017	0.00017		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00052	0.00052		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.0002	0.0002		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00526	0.00526		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00055	0.00055		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00431	0.00431		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	-0.00004	-0.00004		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00048	0.00048		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00113	0.00113		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.0078	0.0078		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.00024	0.00024		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	0.00021	0.00021		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00101	0.00101		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00445	0.00445		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00029	0.00029		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00076	0.00076		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00115	0.00115		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00004	-0.00004		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.00144	0.00144		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.06226	0.06226		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00147	0.00147		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.00676	0.00676		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	0.00103	0.00103		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.1346	0.1346		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00037	0.00037		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01611	0.01611		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00122	0.00122		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684566	CCB	ICP-200.7-W-D	CCB		2/6/2018 11:51:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00244	0.00244		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00022	0.00022		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.04622	-0.04622		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.0002	-0.0002		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00044	0.00044		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.01446099	0.01446099		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.01446099	0.01446099		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684567	ULR4	ICP-6010-W-D	ULR4		2/6/2018 11:54:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00447	0		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Antimony	A	mg/L	0.00396	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Arsenic	A	mg/L	0.00641	0		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	mg/L	0.00321	0.00321		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00014	0		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	mg/L	0.00559	0		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00205	0.00205		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	mg/L	909.09	909.09		1000	0	0	0.1126450	1	900	91%	90	110	0%	
Chromium	A	mg/L	0.00084	0		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	mg/L	-0.00063	0		0	0	0	0.0033639	0.021	450	0%	0	0	0%	
Copper	A	mg/L	0.00458	0		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	mg/L	0.00459	0		0	0	0	0.0189485	0.02	90	0%	0	0	0%	
Iron	A	mg/L	0.01303	0		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Lead	A	mg/L	0.00746	0		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Lithium	A	mg/L	0.03354	0.03354		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	1014.1	1014.1		1000	0	0	0.0238838	1	4500	101%	90	110	0%	
Manganese	A	mg/L	-0.00022	0		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	mg/L	0.00185	0		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00004	0		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	mg/L	-0.00195	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.1869	0.1869		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	mg/L	-0.00439	0		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	mg/L	0.02889	0		0	0	0	0.0487685	0.05	450	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684567	ULR4	ICP-6010-W-D	ULR4		2/6/2018 11:54:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	0.00103	0		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	mg/L	0.2514	0.2514		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	mg/L	0.05317	0.05317		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tellurium	A	mg/L	0.00936	0		0	0	0	0.0301968	1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00243	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	A	mg/L	0.00047	0		0	0	0	0.0081865	0.0081865	225	0%	0	0	0%	
Titanium	A	mg/L	0.00862	0.00862		0	0	0	0.002716	0.002716	225	0%	0	0	0%	
Uranium	A	mg/L	-0.28688	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.0007	0		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	mg/L	0.00231	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0618246	0		0	0	0	0.1043647	0.107	100	0%	0	0	0%	
Uranium, Activity	C	mg/L	-194.21776	0		0	0	0	78.127319	78.127319	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684568	ULR5	ICP-6010-W-D	ULR5		2/6/2018 11:59:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.07496	0		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Antimony	A	mg/L	0.00081	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Arsenic	A	mg/L	-0.00542	0		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	mg/L	0.00031	0		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00006	0		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	mg/L	-0.05825	0		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00302	0.00302		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	mg/L	0.06352	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	-0.20934	0		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	mg/L	-0.00466	0		0	0	0	0.0033639	0.021	450	0%	0	0	0%	
Copper	A	mg/L	-0.00501	0		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	mg/L	-0.1085	0		0	0	0	0.0189485	0.02	90	0%	0	0	0%	
Iron	A	mg/L	1043.1	1043.1		1000	0	0	0.1085536	0.1085536	1800	104%	90	110	0%	
Lead	A	mg/L	0.04203	0.04203		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Lithium	A	mg/L	-0.00201	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.08385	0.08385		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	-0.05508	0		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	mg/L	-0.00149	0		0	0	0	0.0031266	0.1	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684568	ULR5	ICP-6010-W-D	ULR5		2/6/2018 11:59:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/L	-0.00293	0		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	mg/L	-0.00168	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.01168	0		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	mg/L	-0.00791	0		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	mg/L	0.01926	0		0	0	0	0.0487685	0.05	450	0%	0	0	0%	
Silver	A	mg/L	0.00142	0		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	mg/L	0.0131	0		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	mg/L	-0.00007	0		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tellurium	A	mg/L	0.04783	0.04783		0	0	0	0.0301968	1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.06708	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	A	mg/L	0.0042	0		0	0	0	0.0081865	0.0081865	225	0%	0	0	0%	
Titanium	A	mg/L	0.00072	0		0	0	0	0.002716	0.002716	225	0%	0	0	0%	
Uranium	A	mg/L	-0.21491	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.01484	0.01484		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	mg/L	-0.00007	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0412164	0		0	0	0	0.1043647	0.107	100	0%	0	0	0%	
Uranium, Activity	C	mg/L	-145.49407	0		0	0	0	78.127319	78.127319	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684678	RINSE	ICP-6010-W-D	SAMP		2/6/2018 12:03:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0006	0		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Arsenic	A	mg/L	0.0042	0		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	mg/L	0.0001	0		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00008	0		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	mg/L	0.00139	0		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00049	0		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	mg/L	0.01101	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00008	0		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00018	0		0	0	0	0.0033639	0.021	450	0%	0	0	0%	
Copper	A	mg/L	-0.00077	0		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	mg/L	0.00071	0		0	0	0	0.0189485	0.02	90	0%	0	0	0%	
Iron	A	mg/L	0.12224	0.12224		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Lead	A	mg/L	-0.00602	0		0	0	0	0.0187623	0.05	900	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684678	RINSE	ICP-6010-W-D	SAMP		2/6/2018 12:03:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lithium	A	mg/L	0.0004	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.00583	0		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	0.00003	0		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	mg/L	-0.00045	0		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00013	0		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	mg/L	-0.00295	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.0398	0		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	mg/L	0.00565	0		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	mg/L	0.0146	0		0	0	0	0.0487685	0.05	450	0%	0	0	0%	
Silver	A	mg/L	-0.00083	0		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	mg/L	0.1242	0.1242		0	0	0	0.1131395	1	450	0%	0	0	0%	J
Strontium	A	mg/L	0.00003	0		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tellurium	A	mg/L	0.01148	0		0	0	0	0.0301968	1	90	0%	0	0	0%	
Vanadium	A	mg/L	0.00051	0		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	mg/L	0.00007	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	0.00243	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Thallium	B	mg/L	0.00158	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	B	mg/L	0.00322	0		0	0	0	0.0081865	0.0081865	225	0%	0	0	0%	
Titanium	B	mg/L	0.00013	0		0	0	0	0.002716	0.002716	225	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.031244	0		0	0	0	0.1043647	0.107	100	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684679	MB-118058	200.7.8-W-D	MBLK		2/6/2018 12:07:0	1	118058	1/31/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01094	0.01094		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Antimony	A	mg/L	-0.00391	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Arsenic	A	mg/L	0.00236	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	
Barium	A	mg/L	0.00005	0		0	0	0	0.0003929	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00006	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.0067	0		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00023	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Calcium	A	mg/L	0.02246	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00018	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00041	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684679	MB-118058	200.7.8-W-D	MBLK		2/6/2018 12:07:0	1	118058	1/31/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	A	mg/L	-0.00007	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Gold	A	mg/L	0.00077	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	
Iron	A	mg/L	0.00849	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lead	A	mg/L	-0.00426	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	
Lithium	A	mg/L	-0.00026	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.00358	0		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	0.00009	0		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	A	mg/L	0.00013	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	
Molybdenum	A	mg/L	0.00038	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00055	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	-0.00123	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.01841	0		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	mg/L	0.00352	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	
Silicon	A	mg/L	0.00716	0		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silver	A	mg/L	-0.00088	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	
Sodium	A	mg/L	0.0863	0		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	mg/L	0.00005	0		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tellurium	A	mg/L	0.01584	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00222	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	A	mg/L	0.00081	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Titanium	A	mg/L	0.00039	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Uranium	A	mg/L	-0.03321	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00146	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00264	0.00264		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Calcium, meq	C	meq/L	0.00112075	0		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.00849	0		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.00029463	0		0	0	0	0.0009592	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00047093	0		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	0.01531667	0		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.01531667	0		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	0.00375405	0		0	0	0	0.0049216	0.0435	1000	0%	0	0	0%	
Uranium, Activity	C	pCi/L	-22.48317	0		0	0	0	78.127319	78.127319	30465	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684680	B18012018-001	200.7.8-W-D	SAMP		2/6/2018 12:11:0	1	118058	1/31/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00466	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Boron	A	mg/L	0.15662	0.15662		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Cobalt	A	mg/L	0.00046	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.0008	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00087	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Tin	A	mg/L	0.00019	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Antimony	B	mg/L	0.00178	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00763	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Barium	B	mg/L	0.02015	0.02015		0	0	0	0.0003929	0.05	18	0%	0	0	0%	J
Beryllium	B	mg/L	0.00008	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.00061	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Calcium	B	mg/L	20.385	20.385		0	0	0	0.1071422	1	180	0%	0	0	0%	
Calcium, meq	B	meq/L	1.0172115	1.0172115		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Chromium	B	mg/L	0.00024	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Gold	B	mg/L	0.00103	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	DL
Iron	B	mg/L	0.08759	0.08759		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	DL
Iron, Ferrous	B	mg/L	0.08759	0.08759		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	DL
Lead	B	mg/L	-0.00737	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Lithium	B	mg/L	0.30132	0.30132		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	B	mg/L	1.8106	1.8106		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Magnesium, meq	B	meq/L	0.14901238	0.14901238		0	0	0	0.0019656	0.0823	1000	0%	0	0	0%	
Manganese	B	mg/L	0.03698	0.03698		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	B	mg/L	-0.0005	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00559	0.00559		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Phosphorus	B	mg/L	0.00326	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	B	mg/L	8.9	8.9		0	0	0	0.0854754	1	900	0%	0	0	0%	
Potassium, meq	B	meq/L	0.227662	0.227662		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Selenium	B	mg/L	0.0037	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silica	B	mg/L	13.5415638	13.5415638		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon	B	mg/L	6.3302	6.3302		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silicon as SiO2	B	mg/L	13.5415638	13.5415638		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silver	B	mg/L	0.00006	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Sodium	B	mg/L	130.17	130.17		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	5.662395	5.662395		0	0	0	0.0096097	0.0435	1000	0%	0	0	0%	
Strontium	B	mg/L	0.43156	0.43156		0	0	0	0.0002417	0.01	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684680	B18012018-001	200.7.8-W-D	SAMP		2/6/2018 12:11:0	1	118058	1/31/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tellurium	B	mg/L	0.01163	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00285	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Titanium	B	mg/L	0.00037	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	B	mg/L	-0.00062	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	B	mg/L	0.00081	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684681	MB-117959	200.7.8-W-D	MBLK		2/6/2018 12:15:0	1	117959	1/29/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00094	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Antimony	A	mg/L	0.00349	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Arsenic	A	mg/L	0.00085	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	
Barium	A	mg/L	0.00013	0		0	0	0	0.0003929	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00006	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.00785	0		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00065	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Calcium	A	mg/L	0.01801	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.0005	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00048	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.00062	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Gold	A	mg/L	0.00126	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	
Iron	A	mg/L	0.00196	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lead	A	mg/L	-0.00125	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	
Lithium	A	mg/L	-0.00029	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.00272	0		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	-0.00005	0		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	A	mg/L	0.00045	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	
Molybdenum	A	mg/L	-0.00044	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00065	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	-0.00066	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.00777	0		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	mg/L	-0.00364	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	
Silicon	A	mg/L	0.00557	0		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silver	A	mg/L	0.00099	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684681	MB-117959	200.7.8-W-D	MBLK		2/6/2018 12:15:0	1	117959	1/29/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Sodium	A	mg/L	0.1017	0		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	mg/L	0.00013	0		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tellurium	A	mg/L	0.0168	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00165	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	A	mg/L	0.00412	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Titanium	A	mg/L	0.00005	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Uranium	A	mg/L	-0.02946	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00111	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00059	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Calcium, meq	C	meq/L	0.0008987	0		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.00196	0		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.00022386	0		0	0	0	0.0009592	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00019876	0		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	0.01191534	0		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.01191534	0		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	0.00442395	0		0	0	0	0.0049216	0.0435	1000	0%	0	0	0%	
Uranium, Activity	C	pCi/L	-19.94442	0		0	0	0	78.127319	78.127319	30465	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684682	B18011897-004	200.7.8-W-D	SAMP		2/6/2018 12:18:5	1	117959	1/29/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/L	0.00008	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.03648	0.03648		0	0	0	0.0080048	0.05	450	0%	0	0	0%	J
Calcium	A	mg/L	113.86	113.86		0	0	0	0.1071422	1	180	0%	0	0	0%	
Magnesium	A	mg/L	54.922	54.922		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Phosphorus	A	mg/L	0.0043	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	5.9084	5.9084		0	0	0	0.0854754	1	900	0%	0	0	0%	
Sodium	A	mg/L	22.611	22.611		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Aluminum	B	mg/L	0.00282	0		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Antimony	B	mg/L	-0.00075	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00426	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Barium	B	mg/L	0.07038	0.07038		0	0	0	0.0003929	0.05	18	0%	0	0	0%	
Cadmium	B	mg/L	0.00038	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Chromium	B	mg/L	0.00069	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684682	B18011897-004	200.7.8-W-D	SAMP		2/6/2018 12:18:5	1	117959	1/29/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cobalt	B	mg/L	0.00091	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	B	mg/L	0.00198	0		0	0	0	0.0048764	0.0048764	225	0%	0	0	0%	DL
Gold	B	mg/L	0.00141	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	
Iron	B	mg/L	0.04516	0.04516		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Iron, Ferrous	B	mg/L	0.04516	0.04516		0	0	0	0.0250321	0.03	1000	0%	0	0	0%	
Lead	B	mg/L	0.00138	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Lithium	B	mg/L	0.02008	0.02008		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	J
Manganese	B	mg/L	0.07058	0.07058		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Mercury	B	mg/L	0.00012	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00878	0.00878		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Nickel	B	mg/L	0.00204	0.00204		0	0	0	0.0012530	0.005	225	0%	0	0	0%	J
Selenium	B	mg/L	0.004	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silica	B	mg/L	14.9418842	14.9418842		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon	B	mg/L	6.9848	6.9848		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silicon as SiO2	B	mg/L	14.9418842	14.9418842		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silver	B	mg/L	-0.00125	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Strontium	B	mg/L	0.88385	0.88385		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tellurium	B	mg/L	0.0139	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00248	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Tin	B	mg/L	0.00237	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Titanium	B	mg/L	0.00257	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Uranium	B	mg/L	-0.08265	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	-55.95405	0		0	0	0	78.127319	78.127319	30465	0%	0	0	0%	DL
Vanadium	B	mg/L	0.00131	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	B	mg/L	0.17991	0.17991		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Calcium, meq	C	meq/L	5.681614	5.681614		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	4.5200806	4.5200806		0	0	0	0.0019656	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.15113687	0.15113687		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Sodium, meq	C	meq/L	0.9835785	0.9835785		0	0	0	0.0096097	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684683	B18011897-005	200.7.8-W-D	SAMP		2/6/2018 12:22:4	1	117959	1/29/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684683	B18011897-005	200.7.8-W-D	SAMP		2/6/2018 12:22:4	1	117959	1/29/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/L	0.00006	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.03729	0.03729		0	0	0	0.0080048	0.05	450	0%	0	0	0%	J
Calcium	A	mg/L	113.89	113.89		0	0	0	0.1071422	1	180	0%	0	0	0%	
Magnesium	A	mg/L	54.942	54.942		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Phosphorus	A	mg/L	0.00612	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	6.1053	6.1053		0	0	0	0.0854754	1	900	0%	0	0	0%	
Sodium	A	mg/L	23.016	23.016		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Aluminum	B	mg/L	0.053	0.053		0	0	0	0.0066084	0.1	18	0%	0	0	0%	J
Antimony	B	mg/L	-0.00153	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00487	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Barium	B	mg/L	0.07185	0.07185		0	0	0	0.0003929	0.05	18	0%	0	0	0%	
Cadmium	B	mg/L	0.00079	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Chromium	B	mg/L	0.00028	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	B	mg/L	0.00052	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	B	mg/L	0.00143	0		0	0	0	0.0048764	0.0048764	225	0%	0	0	0%	DL
Gold	B	mg/L	-0.00641	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	
Iron	B	mg/L	0.14893	0.14893		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Iron, Ferrous	B	mg/L	0.14893	0.14893		0	0	0	0.0250321	0.03	1000	0%	0	0	0%	
Lead	B	mg/L	-0.00035	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Lithium	B	mg/L	0.0205	0.0205		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	J
Manganese	B	mg/L	0.07293	0.07293		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Mercury	B	mg/L	-0.00074	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00833	0.00833		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Nickel	B	mg/L	0.00166	0.00166		0	0	0	0.0012530	0.005	225	0%	0	0	0%	J
Selenium	B	mg/L	0.00397	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silica	B	mg/L	15.399673	15.399673		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon	B	mg/L	7.1988	7.1988		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silicon as SiO2	B	mg/L	15.399673	15.399673		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silver	B	mg/L	-0.0002	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Strontium	B	mg/L	0.899	0.899		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tellurium	B	mg/L	0.01303	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00327	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Tin	B	mg/L	-0.00031	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Titanium	B	mg/L	0.00285	0.00285		0	0	0	0.002716	0.005	225	0%	0	0	0%	J
Uranium	B	mg/L	-0.05896	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684683	B18011897-005	200.7.8-W-D	SAMP		2/6/2018 12:22:4	1	117959	1/29/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium, Activity	B	pCi/L	-39.91592	0		0	0	0	78.127319	78.127319	30465	0%	0	0	0%	DL
Vanadium	B	mg/L	-0.00035	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	B	mg/L	0.19906	0.19906		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Calcium, meq	C	meq/L	5.683111	5.683111		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	4.5217266	4.5217266		0	0	0	0.0019656	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.15617357	0.15617357		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Sodium, meq	C	meq/L	1.001196	1.001196		0	0	0	0.0096097	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684684	B18020239-001	200.7.8-W-D	SAMP		2/6/2018 12:26:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0062	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Barium	A	mg/L	0.03793	0.03793		0	0	0	0.0003929	0.05	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.00007	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.08147	0.08147		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	38.086	38.086		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00042	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.00024	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Lithium	A	mg/L	0.00716	0.00716		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	13.217	13.217		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Nickel	A	mg/L	-0.0003	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	1.9476	1.9476		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	1.3252	1.3252		0	0	0	0.0854754	1	900	0%	0	0	0%	
Silicon	A	mg/L	4.3435	4.3435		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	14.149	14.149		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Strontium	A	mg/L	0.25894	0.25894		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00266	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Titanium	A	mg/L	0.00134	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.00077	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00201	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	-0.00356	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00365	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00049	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684684	B18020239-001	200.7.8-W-D	SAMP		2/6/2018 12:26:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Gold	B	mg/L	-0.00081	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	DL
Iron	B	mg/L	0.00734	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	DL
Iron, Ferrous	B	mg/L	0.00734	0		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	DL
Lead	B	mg/L	-0.0046	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.00425	0.00425		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	B	mg/L	-0.00138	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00942	0.00942		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Selenium	B	mg/L	0.00818	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.0013	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Tellurium	B	mg/L	0.01638	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	0.00101	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Calcium, meq	C	meq/L	1.9004914	1.9004914		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	1.0877591	1.0877591		0	0	0	0.0019656	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.03389862	0.03389862		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	9.2916152	9.2916152		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	9.2916152	9.2916152		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	0.6154815	0.6154815		0	0	0	0.0096097	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684685	B18020240-001	6010.20-W-D	SAMP		2/6/2018 12:30:1	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.188932	0.94466		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	44.754	223.77		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.07982	0.3991		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	33.388	166.94		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	1.87246	9.3623		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.56634	2.8317		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.002442	0		0	0	0	0.0409327	0.05	225	0%	0	0	0%	
Aluminum	B	mg/L	0.003272	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	D
Antimony	B	mg/L	-0.00149	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.010658	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.00003	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.000666	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	0.000498	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684685	B18020240-001	6010.20-W-D	SAMP		2/6/2018 12:30:1	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cobalt	B	mg/L	0.00037	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	-0.000196	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	-0.003238	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	0.37038	1.8519		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Lead	B	mg/L	-0.00734	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.23202	1.1601		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.003784	0.01892		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.00007	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.003932	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	0.005838	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	4.0610145	20.3050725		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D
Silicon	B	mg/L	1.89838	9.4919		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	4.0610145	20.3050725		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D
Silver	B	mg/L	-0.000768	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	143.014	715.07		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Tellurium	B	mg/L	0.014696	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.001302	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Titanium	B	mg/L	0.001006	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Vanadium	B	mg/L	0.000232	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.002568	0.01284		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	D
Iron, Ferrous	C	mg/L	0.37038	1.8519		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684686	CCV	ICP-200.7-W-D	CCV		2/6/2018 12:34:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5856	2.5856		2.5	0	0	0.0066084	0.1	18	103%	90	110	0%	
Antimony	A	mg/L	2.6009	2.6009		2.5	0	0	0.0356182	0.05	225	104%	90	110	0%	
Arsenic	A	mg/L	2.5909	2.5909		2.5	0	0	0.0231651	0.1	225	104%	90	110	0%	
Barium	A	mg/L	2.5796	2.5796		2.5	0	0	0.0003929	0.1	18	103%	90	110	0%	
Beryllium	A	mg/L	1.2968	1.2968		1.25	0	0	0.0002318	0.01	22.5	104%	90	110	0%	
Boron	A	mg/L	2.5873	2.5873		2.5	0	0	0.0080048	0.1	450	103%	90	110	0%	
Cadmium	A	mg/L	2.5231	2.5231		2.5	0	0	0.0010328	0.01	90	101%	90	110	0%	
Calcium	A	mg/L	26.326	26.326		25	0	0	0.1071422	1	180	105%	90	110	0%	
Chromium	A	mg/L	2.572	2.572		2.5	0	0	0.0010626	0.05	225	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684686	CCV	ICP-200.7-W-D	CCV		2/6/2018 12:34:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cobalt	A	mg/L	2.5015	2.5015		2.5	0	0	0.0033639	0.02	450	100%	90	110	0%	
Copper	A	mg/L	2.5923	2.5923		2.5	0	0	0.0048764	0.01	225	104%	90	110	0%	
Gold	A	mg/L	2.5442	2.5442		2.5	0	0	0.0189485	0.1	90	102%	90	110	0%	
Iron	A	mg/L	2.7028	2.7028		2.5	0	0	0.0250321	0.0250321	360	108%	90	110	0%	
Lead	A	mg/L	2.5092	2.5092		2.5	0	0	0.0187623	0.05	900	100%	90	110	0%	
Lithium	A	mg/L	1.3762	1.3762		1.25	0	0	0.0059040	0.1	22.5	110%	90	110	0%	
Magnesium	A	mg/L	26.822	26.822		25	0	0	0.0116555	1	180	107%	90	110	0%	
Manganese	A	mg/L	2.5332	2.5332		2.5	0	0	0.0010649	0.01	45	101%	90	110	0%	
Mercury	A	mg/L	1.0378	1.0378		1	0	0	0.0100947	0.02	45	104%	90	110	0%	
Molybdenum	A	mg/L	2.5603	2.5603		2.5	0	0	0.0031266	0.1	225	102%	90	110	0%	
Nickel	A	mg/L	2.4972	2.4972		2.5	0	0	0.0012530	0.05	225	100%	90	110	0%	
Phosphorus	A	mg/L	2.6339	2.6339		2.5	0	0	0.0425464	0.1	360	105%	90	110	0%	
Potassium	A	mg/L	27.41	27.41		25	0	0	0.0854754	1	900	110%	90	110	0%	
Selenium	A	mg/L	2.5438	2.5438		2.5	0	0	0.0234201	0.1	225	102%	90	110	0%	
Silicon	A	mg/L	5.2319	5.2319		5	0	0	0.0487685	0.1	450	105%	90	110	0%	
Silver	A	mg/L	1.0358	1.0358		1	0	0	0.0055813	0.01	2	104%	90	110	0%	
Sodium	A	mg/L	27.62	27.62		25	0	0	0.1131395	1	450	110%	90	110	0%	
Strontium	A	mg/L	2.5643	2.5643		2.5	0	0	0.0002417	0.1	18	103%	90	110	0%	
Tellurium	A	mg/L	2.574	2.574		2.5	0	0	0.0301968	0.1	90	103%	90	110	0%	
Thallium	A	mg/L	2.5092	2.5092		2.5	0	0	0.0116401	0.5	225	100%	90	110	0%	
Tin	A	mg/L	2.5168	2.5168		2.5	0	0	0.0081865	0.1	225	101%	90	110	0%	
Titanium	A	mg/L	2.579	2.579		2.5	0	0	0.002716	0.01	225	103%	90	110	0%	
Uranium	A	mg/L	2.5754	2.5754		2.5	0	0	0.1154022	0.1154022	900	103%	90	110	0%	
Vanadium	A	mg/L	2.5988	2.5988		2.5	0	0	0.0036660	0.1	225	104%	90	110	0%	
Zinc	A	mg/L	2.5365	2.5365		2.5	0	0	0.0023364	0.01	90	101%	90	110	0%	
Silica	C	mg/L	11.1920805	11.1920805		10.7	0	0	0.1043257	0.21392	100	105%	90	110	0%	
Silicon as SiO2	C	mg/L	11.1920805	11.1920805		10.7	0	0	0.1043257	0.21392	0	105%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684687	CCB	ICP-200.7-W-D	CCB		2/6/2018 12:37:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.0007	-0.0007		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	0.00004	0.00004		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.0014	0.0014		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684687	CCB	ICP-200.7-W-D	CCB		2/6/2018 12:37:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.00048	0.00048		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00021	0.00021		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00078	0.00078		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00024	0.00024		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00505	0.00505		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00001	0.00001		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00037	0.00037		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00074	0.00074		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00451	0.00451		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.0016	0.0016		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.0097	-0.0097		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	-0.00026	-0.00026		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00497	0.00497		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00003	0.00003		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00001	0.00001		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00124	0.00124		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00015	-0.00015		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.0022	0.0022		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.01428	0.01428		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.0026	0.0026		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.00891	0.00891		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	0.0002	0.0002		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.1029	0.1029		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.0004	0.0004		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01229	0.01229		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00425	-0.00425		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	0.00344	0.00344		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00043	0.00043		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.05613	-0.05613		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00107	0.00107		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00035	0.00035		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.01906027	0.01906027		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.01906027	0.01906027		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684688	B18020240-001	6010.20-W-D	SD		2/6/2018 12:41:5	25	R294307		0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0016532	0		0	0	0	0.1652090	0.1652090	18	0%	0	0		
Antimony	A	mg/L	0.00065	0		0	0	0	0.8904543	0.8904543	225	0%	0	0		
Arsenic	A	mg/L	0.0058264	0		0	0	0	0.5791275	0.5791275	225	0%	0	0		
Barium	A	mg/L	0.0009212	0.02303		0	0	0.01944	0.0098226	0.05	18	0%	0	0		N
Beryllium	A	mg/L	0.000058	0		0	0	0	0.0057939	0.0057939	22.5	0%	0	0		
Boron	A	mg/L	0.040452	1.0113		0	0	0.94466	0.2001210	0.2001210	450	0%	0	0		N
Cadmium	A	mg/L	0.0004468	0		0	0	0	0.0258210	0.0258210	90	0%	0	0		
Calcium	A	mg/L	9.4916	237.29		0	0	223.77	2.6785549	2.6785549	180	0%	0	0	6%	
Chromium	A	mg/L	0.0001568	0		0	0	0	0.0265655	0.0265655	225	0%	0	0		
Cobalt	A	mg/L	0.0003768	0		0	0	0	0.0840963	0.0840963	450	0%	0	0		
Copper	A	mg/L	0.0020288	0		0	0	0	0.1219109	0.1219109	225	0%	0	0		
Gold	A	mg/L	0.00025	0		0	0	0	0.4737126	0.4737126	90	0%	0	0		
Iron	A	mg/L	0.078956	1.9739		0	0	1.8519	0.6258017	0.6258017	360	0%	0	0		N
Lead	A	mg/L	-0.0023368	0		0	0	0	0.4690566	0.4690566	900	0%	0	0		
Lithium	A	mg/L	0.0167648	0.41912		0	0	0.3991	0.1476007	0.1476007	22.5	0%	0	0		N
Magnesium	A	mg/L	6.918	172.95		0	0	166.94	0.597095	1	4500	0%	0	0	4%	
Manganese	A	mg/L	0.04924	1.231		0	0	1.1601	0.0266221	0.0266221	45	0%	0	0	6%	
Molybdenum	A	mg/L	0.001256	0		0	0	0.01892	0.0781662	0.0781662	225	0%	0	0		
Nickel	A	mg/L	-0.0002088	0		0	0	0	0.0313261	0.0313261	225	0%	0	0		
Phosphorus	A	mg/L	-0.0000624	0		0	0	0	1.0636609	1.0636609	360	0%	0	0		
Potassium	A	mg/L	0.41988	10.497		0	0	9.3623	2.1368849	2.1368849	900	0%	0	0		N
Selenium	A	mg/L	0.0044068	0		0	0	0	0.5855016	0.5855016	225	0%	0	0		
Silicon	A	mg/L	0.4098	10.245		0	0	9.4919	1.2192137	1.2192137	450	0%	0	0		N
Silver	A	mg/L	0.0005464	0		0	0	0	0.1395332	0.1395332	2	0%	0	0		
Sodium	A	mg/L	30.0604	751.51		0	0	715.07	5.5228412	5.5228412	4500	0%	0	0	5%	
Strontium	A	mg/L	0.118768	2.9692		0	0	2.8317	0.0060419	0.01	18	0%	0	0	5%	
Tellurium	A	mg/L	0.0157196	0		0	0	0	0.7549204	0.7549204	90	0%	0	0		
Thallium	A	mg/L	-0.0031636	0		0	0	0	0.2910028	0.2910028	225	0%	0	0		
Tin	A	mg/L	0.0020808	0		0	0	0	0.2046637	0.2046637	225	0%	0	0		
Titanium	A	mg/L	0.001112	0		0	0	0	0.067899	0.067899	225	0%	0	0		
Uranium	A	mg/L	-0.058416	0		0	0	0	2.8850561	2.8850561	900	0%	0	0		
Vanadium	A	mg/L	-0.0000024	0		0	0	0	0.0916504	0.0916504	225	0%	0	0		
Zinc	A	mg/L	0.0009732	0		0	0	0.01284	0.0584104	0.0584104	90	0%	0	0		
Iron, Ferrous	C	mg/L	0.078956	1.9739		0	0	1.8519	0.6258017	0.6258017	1000	0%	0	0		N
Silica	C	mg/L	0.87664416	21.916104		0	0	20.305072	2.6081419	2.6081419	1000	0%	0	0		N

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684688	B18020240-001	6010.20-W-D	SD		2/6/2018 12:41:5	25	R294307		0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	0.87664416	21.916104		0	0	20.305072	2.6081419	2.6081419	1000	0%	0	0		N

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684689	B18020240-001	6010.20-W-D	MS2		2/6/2018 12:45:4	5.15	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.73359223	24.378		25	0	0	0.0340331	0.0340331	18	98%	75	125	0%	
Antimony	A	mg/L	0.99866019	5.1431		5	0	0	0.1834336	0.1834336	225	103%	75	125	0%	
Arsenic	A	mg/L	1.01172816	5.2104		5	0	0	0.1193003	0.1193003	225	104%	75	125	0%	
Barium	A	mg/L	0.99242718	5.111		5	0.01944	0	0.0020235	0.05	18	102%	75	125	0%	
Beryllium	A	mg/L	0.48807767	2.5136		2.5	0	0	0.0011935	0.0011935	22.5	101%	75	125	0%	
Boron	A	mg/L	1.18862136	6.1214		5	0.94466	0	0.0412249	0.05	450	104%	75	125	0%	
Cadmium	A	mg/L	0.48182524	2.4814		2.5	0	0	0.0053191	0.0053191	90	99%	75	125	0%	
Calcium	A	mg/L	91.9941748	473.77		250	223.77	0	0.5517823	1	180	100%	75	125	0%	
Chromium	A	mg/L	0.9598835	4.9434		5	0	0	0.0054725	0.0054725	225	99%	75	125	0%	
Cobalt	A	mg/L	0.9323301	4.8015		5	0	0	0.0173238	0.0173238	450	96%	75	125	0%	
Copper	A	mg/L	0.98106796	5.0525		5	0	0	0.0251136	0.0251136	225	101%	75	125	0%	
Gold	A	mg/L	0.95908738	4.9393		5	0	0	0.0975848	0.0975848	90	99%	75	125	0%	
Iron	A	mg/L	5.4007767	27.814		25	1.8519	0	0.1289152	0.1289152	360	104%	75	125	0%	
Lead	A	mg/L	0.91792233	4.7273		5	0	0	0.0966257	0.0966257	900	95%	75	125	0%	
Lithium	A	mg/L	1.13124272	5.8259		5	0.3991	0	0.0304057	0.1	22.5	109%	75	125	0%	
Magnesium	A	mg/L	83.0330097	427.62		250	166.94	0	0.1230016	1	4500	104%	75	125	0%	
Manganese	A	mg/L	5.00466019	25.774		25	1.1601	0	0.0054842	0.0054842	45	98%	75	125	0%	
Molybdenum	A	mg/L	0.96147573	4.9516		5	0.01892	0	0.0161022	0.0161022	225	99%	75	125	0%	
Nickel	A	mg/L	0.92508738	4.7642		5	0	0	0.0064532	0.0064532	225	95%	75	125	0%	
Phosphorus	A	mg/L	10.2359223	52.715		50	0	0	0.2191141	0.2191141	360	105%	75	125	0%	
Potassium	A	mg/L	53.9203883	277.69		250	9.3623	0	0.4401983	1	900	107%	75	125	0%	
Selenium	A	mg/L	0.98957282	5.0963		5	0	0	0.1206133	0.1206133	225	102%	75	125	0%	
Silicon	A	mg/L	11.9044660	61.308		50	9.4919	0	0.2511580	0.2511580	450	104%	75	125	0%	
Silver	A	mg/L	0.47213592	2.4315		2.5	0	0	0.0287438	0.0287438	2	97%	75	125	0%	
Sodium	A	mg/L	189.675728	976.83		250	715.07	0	1.1377053	1.1377053	4500	105%	75	125	0%	
Strontium	A	mg/L	1.51411650	7.7977		5	2.8317	0	0.0012446	0.01	18	99%	75	125	0%	
Tellurium	A	mg/L	1.00316505	5.1663		5	0	0	0.1555136	0.1555136	90	103%	75	125	0%	
Thallium	A	mg/L	0.9198835	4.7374		5	0	0	0.0599466	0.0599466	225	95%	75	125	0%	
Tin	A	mg/L	0.93926214	4.8372		5	0	0	0.0421607	0.05	225	97%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684689	B18020240-001	6010.20-W-D	MS2		2/6/2018 12:45:4	5.15	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Titanium	A	mg/L	0.98518447	5.0737		5	0	0	0.0139872	0.0139872	225	101%	75	125	0%	
Uranium	A	mg/L	0.98225243	5.0586		0	0	0	0.5943216	0.5943216	900	0%	75	125	0%	
Vanadium	A	mg/L	0.99469903	5.1227		5	0	0	0.01888	0.01888	225	102%	75	125	0%	
Zinc	A	mg/L	0.9723301	5.0075		5	0.01284	0	0.0120325	0.0120325	90	100%	75	125	0%	
Iron, Ferrous	C	mg/L	5.4007767	27.814		0	1.8519	0	0.1289152	0.1289152	1000	0%	0	0	0%	
Silica	C	mg/L	25.4660337	131.150074		107	20.305072	0	0.5372772	0.5372772	1000	104%	75	125	0%	
Silicon as SiO2	C	mg/L	25.4660337	131.150074		107	20.305072	0	0.5372772	0.5372772	1000	104%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684690	B18020240-001	6010.20-W-D	MSD2		2/6/2018 12:49:3	5.15	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.71864078	24.301		25	0	24.378	0.0340331	0.0340331	18	97%	75	125	0%	
Antimony	A	mg/L	0.99644660	5.1317		5	0	5.1431	0.1834336	0.1834336	225	103%	75	125	0%	
Arsenic	A	mg/L	1.00330097	5.167		5	0	5.2104	0.1193003	0.1193003	225	103%	75	125	1%	
Barium	A	mg/L	1.01198058	5.2117		5	0.01944	5.111	0.0020235	0.05	18	104%	75	125	2%	
Beryllium	A	mg/L	0.49821359	2.5658		2.5	0	2.5136	0.0011935	0.0011935	22.5	103%	75	125	2%	
Boron	A	mg/L	1.20434951	6.2024		5	0.94466	6.1214	0.0412249	0.05	450	105%	75	125	1%	
Cadmium	A	mg/L	0.48312621	2.4881		2.5	0	2.4814	0.0053191	0.0053191	90	100%	75	125	0%	
Calcium	A	mg/L	93.3145631	480.57		250	223.77	473.77	0.5517823	1	180	103%	75	125	1%	
Chromium	A	mg/L	0.96042718	4.9462		5	0	4.9434	0.0054725	0.0054725	225	99%	75	125	0%	
Cobalt	A	mg/L	0.93240777	4.8019		5	0	4.8015	0.0173238	0.0173238	450	96%	75	125	0%	
Copper	A	mg/L	0.99994175	5.1497		5	0	5.0525	0.0251136	0.0251136	225	103%	75	125	2%	
Gold	A	mg/L	0.94151456	4.8488		5	0	4.9393	0.0975848	0.0975848	90	97%	75	125	2%	
Iron	A	mg/L	5.50058252	28.328		25	1.8519	27.814	0.1289152	0.1289152	360	106%	75	125	2%	
Lead	A	mg/L	0.93289320	4.8044		5	0	4.7273	0.0966257	0.0966257	900	96%	75	125	2%	
Lithium	A	mg/L	1.14561165	5.8999		5	0.3991	5.8259	0.0304057	0.1	22.5	110%	75	125	1%	
Magnesium	A	mg/L	84.3786408	434.55		250	166.94	427.62	0.1230016	1	4500	107%	75	125	2%	
Manganese	A	mg/L	5.11592233	26.347		25	1.1601	25.774	0.0054842	0.0054842	45	101%	75	125	2%	
Molybdenum	A	mg/L	0.96417476	4.9655		5	0.01892	4.9516	0.0161022	0.0161022	225	99%	75	125	0%	
Nickel	A	mg/L	0.92530097	4.7653		5	0	4.7642	0.0064532	0.0064532	225	95%	75	125	0%	
Phosphorus	A	mg/L	10.1984466	52.522		50	0	52.715	0.2191141	0.2191141	360	105%	75	125	0%	
Potassium	A	mg/L	54.8640777	282.55		250	9.3623	277.69	0.4401983	1	900	109%	75	125	2%	
Selenium	A	mg/L	0.9863301	5.0796		5	0	5.0963	0.1206133	0.1206133	225	102%	75	125	0%	
Silicon	A	mg/L	11.7827184	60.681		50	9.4919	61.308	0.2511580	0.2511580	450	102%	75	125	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684690	B18020240-001	6010.20-W-D	MSD2		2/6/2018 12:49:3	5.15	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	0.48512621	2.4984		2.5	0	2.4315	0.0287438	0.0287438	2	100%	75	125	3%	
Sodium	A	mg/L	189.996117	978.48		250	715.07	976.83	1.1377053	1.1377053	4500	105%	75	125	0%	
Strontium	A	mg/L	1.53609709	7.9109		5	2.8317	7.7977	0.0012446	0.01	18	102%	75	125	1%	
Tellurium	A	mg/L	0.99450485	5.1217		5	0	5.1663	0.1555136	0.1555136	90	102%	75	125	1%	
Thallium	A	mg/L	0.92854369	4.782		5	0	4.7374	0.0599466	0.0599466	225	96%	75	125	1%	
Tin	A	mg/L	0.93864078	4.834		5	0	4.8372	0.0421607	0.05	225	97%	75	125	0%	
Titanium	A	mg/L	0.97856311	5.0396		5	0	5.0737	0.0139872	0.0139872	225	101%	75	125	1%	
Uranium	A	mg/L	0.90656311	4.6688		0	0	5.0586	0.5943216	0.5943216	900	0%	75	125	8%	
Vanadium	A	mg/L	1.01467961	5.2256		5	0	5.1227	0.01888	0.01888	225	105%	75	125	2%	
Zinc	A	mg/L	0.97201942	5.0059		5	0.01284	5.0075	0.0120325	0.0120325	90	100%	75	125	0%	
Iron, Ferrous	C	mg/L	5.50058252	28.328		0	1.8519	27.814	0.1289152	0.1289152	1000	0%	0	0	2%	
Silica	C	mg/L	25.2055913	129.808795		107	20.305072	131.15007	0.5372772	0.5372772	1000	102%	75	125	1%	
Silicon as SiO2	C	mg/L	25.2055913	129.808795		107	20.305072	131.15007	0.5372772	0.5372772	1000	102%	75	125	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684691	B18020240-002	6010.20-W-D	SAMP		2/6/2018 12:53:2	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.23806	1.1903		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	40.282	201.41		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.094628	0.47314		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	37.71	188.55		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	2.575	12.875		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.54214	2.7107		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.0014	0		0	0	0	0.0409327	0.05	225	0%	0	0	0%	
Aluminum	B	mg/L	0.018954	0.09477		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	D
Antimony	B	mg/L	0.00035	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.00146	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000122	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.00023	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	-0.000216	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.000234	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	0.000564	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	0.001696	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	1.03348	5.1674		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684691	B18020240-002	6010.20-W-D	SAMP		2/6/2018 12:53:2	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	B	mg/L	-0.003348	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.253	1.265		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.00065	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.000658	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.016808	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	0.001088	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	4.23167987	21.1583994		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D
Silicon	B	mg/L	1.97816	9.8908		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	4.23167987	21.1583994		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D
Silver	B	mg/L	-0.000856	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	80.25	401.25		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Tellurium	B	mg/L	0.01627	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.001456	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Titanium	B	mg/L	0.001722	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.062458	0		0	0	0	0.5770112	0.5770112	900	0%	0	0	0%	D
Vanadium	B	mg/L	0.001518	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.000346	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	D
Iron, Ferrous	C	mg/L	1.03348	5.1674		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684692	B18020240-003	6010.20-W-D	SAMP		2/6/2018 12:57:1	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.152136	0.76068		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	34.258	171.29		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.047268	0.23634		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	27.062	135.31		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	2.2276	11.138		0	0	0	0.427377	1	900	0%	0	0	0%	
Silicon	A	mg/L	2.7692	13.846		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Strontium	A	mg/L	0.4735	2.3675		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00044	0		0	0	0	0.0409327	0.05	225	0%	0	0	0%	
Aluminum	B	mg/L	0.0033	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	D
Antimony	B	mg/L	0.000126	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.001678	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Barium	B	mg/L	0.022238	0.11119		0	0	0	0.0019645	0.0019645	18	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684692	B18020240-003	6010.20-W-D	SAMP		2/6/2018 12:57:1	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	B	mg/L	0.000078	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.000518	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	0.000196	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	D
Copper	B	mg/L	0.001204	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	0.00104	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	0.016882	0		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.016882	0		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.003382	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.49184	2.4592		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.00165	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.003992	0.01996		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.002958	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	0.007144	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silver	B	mg/L	0.000002	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	22.584	112.92		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Tellurium	B	mg/L	0.014692	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	0.000492	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Titanium	B	mg/L	0.001246	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Vanadium	B	mg/L	0.001596	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.001054	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	D
Silica	C	mg/L	5.92387264	29.6193632		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D
Silicon as SiO2	C	mg/L	5.92387264	29.6193632		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684693	B18020240-004	6010.20-W-D	SAMP		2/6/2018 1:01:04	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.025184	0.12592		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	10.4392	52.196		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.006068	0.03034		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	3.8604	19.302		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	0.76474	3.8237		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.095876	0.47938		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Tin	A	mg/L	-0.000376	0		0	0	0	0.0409327	0.05	225	0%	0	0	0%	
Aluminum	B	mg/L	0.006414	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684693	B18020240-004	6010.20-W-D	SAMP		2/6/2018 1:01:04	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/L	0.002132	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.002724	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Barium	B	mg/L	0.009172	0.04586		0	0	0	0.0019645	0.0019645	18	0%	0	0	0%	D
Beryllium	B	mg/L	0.000038	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.000308	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	0.000216	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	D
Cobalt	B	mg/L	-0.000318	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	0.00024	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	0.003538	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	0.009098	0		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.009098	0		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.00618	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.001016	0		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.004346	0.02173		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	-0.000012	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.003872	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	0.00191	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	1.67503638	8.37518192		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D
Silicon	B	mg/L	0.78302	3.9151		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	1.67503638	8.37518192		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D
Silver	B	mg/L	0.001028	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	9.9212	49.606		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Tellurium	B	mg/L	0.007784	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.000238	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Titanium	B	mg/L	0.000696	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Vanadium	B	mg/L	0.00039	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.000816	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684694	B18020240-005	6010.20-W-D	SAMP		2/6/2018 1:22:43	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.054638	0.27319		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	39.658	198.29		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.019772	0.09886		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684694	B18020240-005	6010.20-W-D	SAMP		2/6/2018 1:22:43	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium	A	mg/L	10.7324	53.662		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	0.61264	3.0632		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.23346	1.1673		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.002706	0		0	0	0	0.0409327	0.05	225	0%	0	0	0%	
Zinc	A	mg/L	0.11358	0.5679		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	D
Aluminum	B	mg/L	0.00334	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	D
Antimony	B	mg/L	0.002998	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.003528	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Barium	B	mg/L	0.019984	0.09992		0	0	0	0.0019645	0.0019645	18	0%	0	0	0%	D
Beryllium	B	mg/L	0.000078	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.000506	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	0.000146	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.00005	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	0.002042	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	-0.000578	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	0.0024	0		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.0024	0		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.008138	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.000196	0		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.001018	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	-0.000114	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.001968	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	0.003962	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	2.91821107	14.5910554		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D
Silicon	B	mg/L	1.36416	6.8208		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	2.91821107	14.5910554		0	0	0	0.5216284	0.5216284	1000	0%	0	0	0%	D
Silver	B	mg/L	0.000696	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	12.1996	60.998		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Tellurium	B	mg/L	0.018532	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.002388	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Titanium	B	mg/L	0.002176	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.065534	0		0	0	0	0.5770112	0.5770112	900	0%	0	0	0%	D
Vanadium	B	mg/L	0.001466	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684695	B18020254-001	200.7.8-W-D	SAMP		2/6/2018 1:26:33	10	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.000941	0.00941		0	0	0	0.0039290	0.05	18	0%	0	0	0%	J
Calcium	A	mg/L	46.996	469.96		0	0	0	1.071422	1.071422	180	0%	0	0	0%	
Lithium	A	mg/L	0.008454	0.08454		0	0	0	0.0590403	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	14.5	145		0	0	0	0.238838	1	4500	0%	0	0	0%	
Potassium	A	mg/L	0.69611	6.9611		0	0	0	0.8547539	1	900	0%	0	0	0%	
Sodium	A	mg/L	98.683	986.83		0	0	0	2.2091365	2.2091365	4500	0%	0	0	0%	D
Strontium	A	mg/L	0.67333	6.7333		0	0	0	0.0024167	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	-0.000269	0		0	0	0	0.0660836	0.0660836	18	0%	0	0	0%	D
Antimony	B	mg/L	0.003429	0		0	0	0	0.3561817	0.3561817	225	0%	0	0	0%	D
Arsenic	B	mg/L	-0.001283	0		0	0	0	0.231651	0.231651	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000097	0		0	0	0	0.0023176	0.0023176	22.5	0%	0	0	0%	D
Boron	B	mg/L	0.003121	0		0	0	0	0.0800484	0.0800484	450	0%	0	0	0%	D
Cadmium	B	mg/L	0.000328	0		0	0	0	0.0103284	0.0103284	90	0%	0	0	0%	D
Chromium	B	mg/L	0.000324	0		0	0	0	0.0106262	0.0106262	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.000436	0		0	0	0	0.0336385	0.0336385	450	0%	0	0	0%	D
Copper	B	mg/L	0.000714	0		0	0	0	0.0487643	0.0487643	225	0%	0	0	0%	D
Gold	B	mg/L	-0.003269	0		0	0	0	0.1894850	0.1894850	90	0%	0	0	0%	D
Iron	B	mg/L	0.16717	1.6717		0	0	0	0.2503207	0.2503207	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.16717	1.6717		0	0	0	0.2503207	0.2503207	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.005149	0		0	0	0	0.1876226	0.1876226	900	0%	0	0	0%	D
Manganese	B	mg/L	0.41123	4.1123		0	0	0	0.0106489	0.0106489	45	0%	0	0	0%	D
Mercury	B	mg/L	-0.001834	0		0	0	0	0.1009469	0.1009469	45	0%	0	0	0%	D
Molybdenum	B	mg/L	-0.000295	0		0	0	0	0.0312665	0.0312665	225	0%	0	0	0%	D
Nickel	B	mg/L	0.000755	0		0	0	0	0.0125304	0.0125304	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.001914	0		0	0	0	0.4254644	0.4254644	360	0%	0	0	0%	D
Selenium	B	mg/L	0.001922	0		0	0	0	0.2342006	0.2342006	225	0%	0	0	0%	D
Silica	B	mg/L	1.14802307	11.4802307		0	0	0	1.0432568	1.0432568	2000	0%	0	0	0%	D
Silicon	B	mg/L	0.53666	5.3666		0	0	0	0.4876855	0.4876855	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	1.14802307	11.4802307		0	0	0	1.0432568	1.0432568	2000	0%	0	0	0%	D
Silver	B	mg/L	-0.001666	0		0	0	0	0.0558133	0.0558133	2	0%	0	0	0%	D
Tellurium	B	mg/L	0.010639	0		0	0	0	0.3019682	0.3019682	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.003084	0		0	0	0	0.1164011	0.1164011	225	0%	0	0	0%	D
Tin	B	mg/L	-0.000201	0		0	0	0	0.0818655	0.0818655	225	0%	0	0	0%	D
Titanium	B	mg/L	0.001912	0		0	0	0	0.0271596	0.0271596	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.066354	0		0	0	0	1.1540224	1.1540224	900	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684695	B18020254-001	200.7.8-W-D	SAMP		2/6/2018 1:26:33	10	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium, Activity	B	pCi/L	-44.921658	0		0	0	0	781.27319	781.27319	30465	0%	0	0	0%	D
Vanadium	B	mg/L	0.00096	0		0	0	0	0.0366602	0.0366602	225	0%	0	0	0%	D
Zinc	B	mg/L	0.000346	0		0	0	0	0.0233642	0.0233642	90	0%	0	0	0%	D
Calcium, meq	C	meq/L	2.3451004	23.451004		0	0	0	0.053464	0.053464	1000	0%	0	0	0%	D
Magnesium, meq	C	meq/L	1.19335	11.9335		0	0	0	0.0196564	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.01780649	0.17806494		0	0	0	0.0218646	0.02558	1000	0%	0	0	0%	
Sodium, meq	C	meq/L	4.2927105	42.927105		0	0	0	0.0960974	0.0960974	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684696	B18020255-001	200.7.8-W-D	SAMP		2/6/2018 1:30:30	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.00246	0.0123		0	0	0	0.0019645	0.05	18	0%	0	0	0%	J
Boron	A	mg/L	0.006672	0		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	70.598	352.99		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.00985	0.04925		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	32.184	160.92		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	1.06294	5.3147		0	0	0	0.427377	1	900	0%	0	0	0%	
Sodium	A	mg/L	134.84	674.2		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Strontium	A	mg/L	0.82156	4.1078		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	-0.0002	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	0.004912	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.001928	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000076	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.000472	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	-0.000314	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	0.002098	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	0.001818	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	-0.004848	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	0.96674	4.8337		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.96674	4.8337		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	0.003218	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.86002	4.3001		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Mercury	B	mg/L	0.001612	0		0	0	0	0.0504735	0.0504735	45	0%	0	0	0%	D
Molybdenum	B	mg/L	-0.000302	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684696	B18020255-001	200.7.8-W-D	SAMP		2/6/2018 1:30:30	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	B	mg/L	0.001058	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	-0.000848	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	0.002542	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	2.21604006	11.0802003		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon	B	mg/L	1.03592	5.1796		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	2.21604006	11.0802003		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silver	B	mg/L	0.00021	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Tellurium	B	mg/L	0.012058	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	0.003086	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	0.002316	0		0	0	0	0.0409327	0.0409327	225	0%	0	0	0%	D
Titanium	B	mg/L	0.001876	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.087258	0		0	0	0	0.5770112	0.5770112	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/L	-59.073666	0		0	0	0	390.63659	390.63659	30465	0%	0	0	0%	D
Vanadium	B	mg/L	0.001034	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.000374	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	
Calcium, meq	C	meq/L	3.5228402	17.614201		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	2.6487432	13.243716		0	0	0	0.0098282	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.02719001	0.13595003		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	
Sodium, meq	C	meq/L	5.86554	29.3277		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684697	B18020256-001	200.7.8-W-D	SAMP		2/6/2018 1:34:26	10	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.001472	0.01472		0	0	0	0.0039290	0.05	18	0%	0	0	0%	J
Calcium	A	mg/L	47.534	475.34		0	0	0	1.071422	1.071422	180	0%	0	0	0%	
Lithium	A	mg/L	0.008904	0.08904		0	0	0	0.0590403	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	43.045	430.45		0	0	0	0.238838	1	4500	0%	0	0	0%	
Potassium	A	mg/L	1.2286	12.286		0	0	0	0.8547539	1	900	0%	0	0	0%	
Sodium	A	mg/L	147.82	1478.2		0	0	0	2.2091365	2.2091365	4500	0%	0	0	0%	D
Strontium	A	mg/L	0.58911	5.8911		0	0	0	0.0024167	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	0.000691	0		0	0	0	0.0660836	0.0660836	18	0%	0	0	0%	D
Antimony	B	mg/L	-0.00197	0		0	0	0	0.3561817	0.3561817	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.003715	0		0	0	0	0.231651	0.231651	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000075	0		0	0	0	0.0023176	0.0023176	22.5	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684697	B18020256-001	200.7.8-W-D	SAMP		2/6/2018 1:34:26	10	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	B	mg/L	0.010583	0.10583		0	0	0	0.0800484	0.0800484	450	0%	0	0	0%	D
Cadmium	B	mg/L	0.00051	0		0	0	0	0.0103284	0.0103284	90	0%	0	0	0%	D
Chromium	B	mg/L	0.000173	0		0	0	0	0.0106262	0.0106262	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.00095	0		0	0	0	0.0336385	0.0336385	450	0%	0	0	0%	D
Copper	B	mg/L	-0.001003	0		0	0	0	0.0487643	0.0487643	225	0%	0	0	0%	D
Gold	B	mg/L	0.001236	0		0	0	0	0.1894850	0.1894850	90	0%	0	0	0%	D
Iron	B	mg/L	0.009803	0		0	0	0	0.2503207	0.2503207	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.009803	0		0	0	0	0.2503207	0.2503207	1000	0%	0	0	0%	D
Lead	B	mg/L	0.003258	0		0	0	0	0.1876226	0.1876226	900	0%	0	0	0%	D
Manganese	B	mg/L	0.37047	3.7047		0	0	0	0.0106489	0.0106489	45	0%	0	0	0%	D
Mercury	B	mg/L	-0.001798	0		0	0	0	0.1009469	0.1009469	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.001009	0		0	0	0	0.0312665	0.0312665	225	0%	0	0	0%	D
Nickel	B	mg/L	0.001666	0.01666		0	0	0	0.0125304	0.0125304	225	0%	0	0	0%	D
Phosphorus	B	mg/L	-0.000588	0		0	0	0	0.4254644	0.4254644	360	0%	0	0	0%	D
Selenium	B	mg/L	-0.005285	0		0	0	0	0.2342006	0.2342006	225	0%	0	0	0%	D
Silica	B	mg/L	1.41116606	14.1116606		0	0	0	1.0432568	1.0432568	2000	0%	0	0	0%	D
Silicon	B	mg/L	0.65967	6.5967		0	0	0	0.4876855	0.4876855	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	1.41116606	14.1116606		0	0	0	1.0432568	1.0432568	2000	0%	0	0	0%	D
Silver	B	mg/L	-0.00018	0		0	0	0	0.0558133	0.0558133	2	0%	0	0	0%	D
Tellurium	B	mg/L	0.013833	0		0	0	0	0.3019682	0.3019682	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.007002	0		0	0	0	0.1164011	0.1164011	225	0%	0	0	0%	D
Tin	B	mg/L	-0.002158	0		0	0	0	0.0818655	0.0818655	225	0%	0	0	0%	D
Titanium	B	mg/L	0.001793	0		0	0	0	0.0271596	0.0271596	225	0%	0	0	0%	D
Vanadium	B	mg/L	0.000777	0		0	0	0	0.0366602	0.0366602	225	0%	0	0	0%	D
Zinc	B	mg/L	0.004416	0.04416		0	0	0	0.0233642	0.0233642	90	0%	0	0	0%	D
Calcium, meq	C	meq/L	2.3719466	23.719466		0	0	0	0.053464	0.053464	1000	0%	0	0	0%	D
Magnesium, meq	C	meq/L	3.5426035	35.426035		0	0	0	0.0196564	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.03142759	0.31427588		0	0	0	0.0218646	0.02558	1000	0%	0	0	0%	
Sodium, meq	C	meq/L	6.43017	64.3017		0	0	0	0.0960974	0.0960974	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684698	CCV	ICP-200.7-W-D	CCV		2/6/2018 1:38:23	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684698	CCV	ICP-200.7-W-D	CCV		2/6/2018 1:38:23	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5161	2.5161		2.5	0	0	0.0066084	0.1	18	101%	90	110	0%	
Antimony	A	mg/L	2.5244	2.5244		2.5	0	0	0.0356182	0.05	225	101%	90	110	0%	
Arsenic	A	mg/L	2.5328	2.5328		2.5	0	0	0.0231651	0.1	225	101%	90	110	0%	
Barium	A	mg/L	2.6415	2.6415		2.5	0	0	0.0003929	0.1	18	106%	90	110	0%	
Beryllium	A	mg/L	1.2517	1.2517		1.25	0	0	0.0002318	0.01	22.5	100%	90	110	0%	
Boron	A	mg/L	2.5059	2.5059		2.5	0	0	0.0080048	0.1	450	100%	90	110	0%	
Cadmium	A	mg/L	2.5353	2.5353		2.5	0	0	0.0010328	0.01	90	101%	90	110	0%	
Calcium	A	mg/L	26.762	26.762		25	0	0	0.1071422	1	180	107%	90	110	0%	
Chromium	A	mg/L	2.5477	2.5477		2.5	0	0	0.0010626	0.05	225	102%	90	110	0%	
Cobalt	A	mg/L	2.5268	2.5268		2.5	0	0	0.0033639	0.02	450	101%	90	110	0%	
Copper	A	mg/L	2.5645	2.5645		2.5	0	0	0.0048764	0.01	225	103%	90	110	0%	
Gold	A	mg/L	2.5425	2.5425		2.5	0	0	0.0189485	0.1	90	102%	90	110	0%	
Iron	A	mg/L	2.5909	2.5909		2.5	0	0	0.0250321	0.0250321	360	104%	90	110	0%	
Lead	A	mg/L	2.4672	2.4672		2.5	0	0	0.0187623	0.05	900	99%	90	110	0%	
Lithium	A	mg/L	1.3367	1.3367		1.25	0	0	0.0059040	0.1	22.5	107%	90	110	0%	
Magnesium	A	mg/L	27.095	27.095		25	0	0	0.0116555	1	180	108%	90	110	0%	
Manganese	A	mg/L	2.5119	2.5119		2.5	0	0	0.0010649	0.01	45	100%	90	110	0%	
Mercury	A	mg/L	1.044	1.044		1	0	0	0.0100947	0.02	45	104%	90	110	0%	
Molybdenum	A	mg/L	2.4864	2.4864		2.5	0	0	0.0031266	0.1	225	99%	90	110	0%	
Nickel	A	mg/L	2.5586	2.5586		2.5	0	0	0.0012530	0.05	225	102%	90	110	0%	
Phosphorus	A	mg/L	2.5323	2.5323		2.5	0	0	0.0425464	0.1	360	101%	90	110	0%	
Potassium	A	mg/L	26.954	26.954		25	0	0	0.0854754	1	900	108%	90	110	0%	
Selenium	A	mg/L	2.5898	2.5898		2.5	0	0	0.0234201	0.1	225	104%	90	110	0%	
Silicon	A	mg/L	5.1278	5.1278		5	0	0	0.0487685	0.1	450	103%	90	110	0%	
Silver	A	mg/L	1.0588	1.0588		1	0	0	0.0055813	0.01	2	106%	90	110	0%	
Sodium	A	mg/L	26.22	26.22		25	0	0	0.1131395	1	450	105%	90	110	0%	
Strontium	A	mg/L	2.6062	2.6062		2.5	0	0	0.0002417	0.1	18	104%	90	110	0%	
Tellurium	A	mg/L	2.5754	2.5754		2.5	0	0	0.0301968	0.1	90	103%	90	110	0%	
Thallium	A	mg/L	2.4982	2.4982		2.5	0	0	0.0116401	0.5	225	100%	90	110	0%	
Tin	A	mg/L	2.4251	2.4251		2.5	0	0	0.0081865	0.1	225	97%	90	110	0%	
Titanium	A	mg/L	2.4878	2.4878		2.5	0	0	0.002716	0.01	225	100%	90	110	0%	
Uranium	A	mg/L	2.606	2.606		2.5	0	0	0.1154022	0.1154022	900	104%	90	110	0%	
Vanadium	A	mg/L	2.5149	2.5149		2.5	0	0	0.0036660	0.1	225	101%	90	110	0%	
Zinc	A	mg/L	2.5036	2.5036		2.5	0	0	0.0023364	0.01	90	100%	90	110	0%	
Silica	C	mg/L	10.9693898	10.9693898		10.7	0	0	0.1043257	0.21392	100	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684698	CCV	ICP-200.7-W-D	CCV		2/6/2018 1:38:23	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	10.9693898	10.9693898		10.7	0	0	0.1043257	0.21392	0	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684699	CCB	ICP-200.7-W-D	CCB		2/6/2018 1:42:07	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00045	0.00045		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	0.00229	0.00229		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00322	0.00322		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00056	0.00056		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00025	0.00025		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00031	0.00031		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00056	0.00056		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00411	0.00411		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00068	0.00068		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00107	0.00107		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00056	0.00056		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.0028	0.0028		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	-0.00061	-0.00061		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00388	-0.00388		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00044	0.00044		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00447	0.00447		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00018	0.00018		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	-0.00106	-0.00106		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00119	0.00119		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0.00041	0.00041		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.00146	-0.00146		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.00306	0.00306		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00195	0.00195		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.00913	0.00913		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	0.00162	0.00162		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.066	0.066		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00041	0.00041		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01256	0.01256		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00024	-0.00024		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684699	CCB	ICP-200.7-W-D	CCB		2/6/2018 1:42:07	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00104	0.00104		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00114	0.00114		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.05518	-0.05518		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00053	-0.00053		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00062	0.00062		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.0195309	0.0195309		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0195309	0.0195309		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684700	B18020257-001	200.7.8-W-D	SAMP		2/6/2018 1:46:01	20	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.0004875	0.00975		0	0	0	0.0078581	0.05	18	0%	0	0	0%	J
Calcium	A	mg/L	21.12	422.4		0	0	0	2.142844	2.142844	180	0%	0	0	0%	D
Magnesium	A	mg/L	29.66	593.2		0	0	0	0.477676	1	4500	0%	0	0	0%	
Potassium	A	mg/L	0.384895	7.6979		0	0	0	1.7095079	1.7095079	900	0%	0	0	0%	D
Sodium	A	mg/L	108.55	2171		0	0	0	4.418273	4.418273	4500	0%	0	0	0%	D
Strontium	A	mg/L	0.37461	7.4922		0	0	0	0.0048335	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	-0.0002645	0		0	0	0	0.1321672	0.1321672	18	0%	0	0	0%	D
Antimony	B	mg/L	0.002821	0		0	0	0	0.7123634	0.7123634	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.001572	0		0	0	0	0.463302	0.463302	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.0001275	0		0	0	0	0.0046351	0.0046351	22.5	0%	0	0	0%	D
Boron	B	mg/L	0.0027955	0		0	0	0	0.1600968	0.1600968	450	0%	0	0	0%	D
Cadmium	B	mg/L	-0.000173	0		0	0	0	0.0206568	0.0206568	90	0%	0	0	0%	D
Chromium	B	mg/L	0.0002485	0		0	0	0	0.0212524	0.0212524	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.0007705	0		0	0	0	0.0672770	0.0672770	450	0%	0	0	0%	D
Copper	B	mg/L	-0.002119	0		0	0	0	0.0975287	0.0975287	225	0%	0	0	0%	D
Gold	B	mg/L	0.000773	0		0	0	0	0.3789701	0.3789701	90	0%	0	0	0%	D
Iron	B	mg/L	0.0065735	0		0	0	0	0.5006414	0.5006414	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.0065735	0		0	0	0	0.5006414	0.5006414	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.0011765	0		0	0	0	0.3752453	0.3752453	900	0%	0	0	0%	D
Lithium	B	mg/L	0.0045475	0		0	0	0	0.1180805	0.1180805	22.5	0%	0	0	0%	
Manganese	B	mg/L	0.15202	3.0404		0	0	0	0.0212977	0.0212977	45	0%	0	0	0%	D
Mercury	B	mg/L	-0.0002055	0		0	0	0	0.2018938	0.2018938	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.00072	0		0	0	0	0.062533	0.062533	225	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684700	B18020257-001	200.7.8-W-D	SAMP		2/6/2018 1:46:01	20	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	B	mg/L	0.0004915	0		0	0	0	0.0250609	0.0250609	225	0%	0	0	0%	D
Phosphorus	B	mg/L	-0.0026745	0		0	0	0	0.8509287	0.8509287	360	0%	0	0	0%	D
Selenium	B	mg/L	0.00683	0		0	0	0	0.4684012	0.4684012	225	0%	0	0	0%	D
Silica	B	mg/L	0.41165695	8.23313904		0	0	0	2.0865135	2.0865135	2000	0%	0	0	0%	D
Silicon	B	mg/L	0.192435	3.8487		0	0	0	0.9753709	0.9753709	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	0.41165695	8.23313904		0	0	0	2.0865135	2.0865135	2000	0%	0	0	0%	D
Silver	B	mg/L	0.0007625	0		0	0	0	0.1116266	0.1116266	2	0%	0	0	0%	D
Tellurium	B	mg/L	0.014659	0		0	0	0	0.6039363	0.6039363	90	0%	0	0	0%	D
Thallium	B	mg/L	0.0012105	0		0	0	0	0.2328023	0.2328023	225	0%	0	0	0%	D
Tin	B	mg/L	0.003	0		0	0	0	0.1637309	0.1637309	225	0%	0	0	0%	D
Titanium	B	mg/L	0.000738	0		0	0	0	0.0543192	0.0543192	225	0%	0	0	0%	D
Vanadium	B	mg/L	0.0005685	0		0	0	0	0.0733203	0.0733203	225	0%	0	0	0%	D
Zinc	B	mg/L	0.0002265	0		0	0	0	0.0467283	0.0467283	90	0%	0	0	0%	D
Calcium, meq	C	meq/L	1.053888	21.07776		0	0	0	0.1069279	0.1069279	1000	0%	0	0	0%	D
Magnesium, meq	C	meq/L	2.441018	48.82036		0	0	0	0.0393127	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00984561	0.19691228		0	0	0	0.0437292	0.0437292	1000	0%	0	0	0%	D
Sodium, meq	C	meq/L	4.721925	94.4385		0	0	0	0.1921949	0.1921949	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684701	B18020258-001	200.7.8-W-D	SAMP		2/6/2018 1:49:57	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.28414	1.4207		0	0	0	0.0019645	0.05	18	0%	0	0	0%	
Boron	A	mg/L	0.028906	0.14453		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	4.6048	23.024		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.030042	0.15021		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	2.59	12.95		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	3.4564	17.282		0	0	0	0.427377	1	900	0%	0	0	0%	
Sodium	A	mg/L	124.674	623.37		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Strontium	A	mg/L	0.164206	0.82103		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	0.000868	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	-0.00045	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	-0.00027	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000068	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.000432	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684701	B18020258-001	200.7.8-W-D	SAMP		2/6/2018 1:49:57	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	B	mg/L	0.000198	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	0.000114	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	-0.000036	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	-0.001704	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	0.003268	0		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.003268	0		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	0.001042	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.002142	0.01071		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Mercury	B	mg/L	-0.000888	0		0	0	0	0.0504735	0.0504735	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.000356	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.000558	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.0055	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	0.00508	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	3.01618643	15.0809322		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon	B	mg/L	1.40996	7.0498		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	3.01618643	15.0809322		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silver	B	mg/L	-0.000796	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Tellurium	B	mg/L	0.018752	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.00297	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	0.00331	0		0	0	0	0.0409327	0.0409327	225	0%	0	0	0%	D
Titanium	B	mg/L	0.000582	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Vanadium	B	mg/L	0.000372	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.000494	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	
Calcium, meq	C	meq/L	0.22977952	1.1488976		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.213157	1.065785		0	0	0	0.0098282	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.08841471	0.44207356		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	
Sodium, meq	C	meq/L	5.423319	27.116595		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684702	B18020258-001	200.7.8-W-D	MS2		2/6/2018 1:53:57	5.15	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.74699029	24.447		25	0	0	0.0340331	0.0340331	18	98%	70	130	0%	
Antimony	A	mg/L	0.97565049	5.0246		5	0	0	0.1834336	0.1834336	225	100%	70	130	0%	
Arsenic	A	mg/L	0.98520388	5.0738		5	0	0	0.1193003	0.1193003	225	101%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684702	B18020258-001	200.7.8-W-D	MS2		2/6/2018 1:53:57	5.15	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	1.2743301	6.5628		5	1.4207	0	0.0020235	0.05	18	103%	70	130	0%	
Beryllium	A	mg/L	0.48561165	2.5009		2.5	0	0	0.0011935	0.0011935	22.5	100%	70	130	0%	
Boron	A	mg/L	1.00796117	5.191		5	0.14453	0	0.0412249	0.05	450	101%	70	130	0%	
Cadmium	A	mg/L	0.48264078	2.4856		2.5	0	0	0.0053191	0.0053191	90	99%	70	130	0%	
Calcium	A	mg/L	54.8932039	282.7		250	23.024	0	0.5517823	1	180	104%	70	130	0%	
Chromium	A	mg/L	0.96460194	4.9677		5	0	0	0.0054725	0.0054725	225	99%	70	130	0%	
Cobalt	A	mg/L	0.94669903	4.8755		5	0	0	0.0173238	0.0173238	450	98%	70	130	0%	
Copper	A	mg/L	0.96976699	4.9943		5	0	0	0.0251136	0.0251136	225	100%	70	130	0%	
Gold	A	mg/L	0.95794175	4.9334		5	0	0	0.0975848	0.0975848	90	99%	70	130	0%	
Iron	A	mg/L	4.99514563	25.725		25	0	0	0.1289152	0.1289152	360	103%	70	130	0%	
Lead	A	mg/L	0.94267961	4.8548		5	0	0	0.0966257	0.0966257	900	97%	70	130	0%	
Lithium	A	mg/L	1.03957282	5.3538		5	0.15021	0	0.0304057	0.1	22.5	104%	70	130	0%	
Magnesium	A	mg/L	53.0951456	273.44		250	12.95	0	0.1230016	1	4500	104%	70	130	0%	
Manganese	A	mg/L	4.79844660	24.712		25	0.01071	0	0.0054842	0.0054842	45	99%	70	130	0%	
Mercury	A	mg/L	0.99273786	5.1126		5	0	0	0.0519877	0.0519877	45	102%	70	130	0%	
Molybdenum	A	mg/L	0.9503301	4.8942		5	0	0	0.0161022	0.0161022	225	98%	70	130	0%	
Nickel	A	mg/L	0.94578641	4.8708		5	0	0	0.0064532	0.0064532	225	97%	70	130	0%	
Phosphorus	A	mg/L	10.0126214	51.565		50	0	0	0.2191141	0.2191141	360	103%	70	130	0%	
Potassium	A	mg/L	54.023301	278.22		250	17.282	0	0.4401983	1	900	104%	70	130	0%	
Selenium	A	mg/L	0.99112621	5.1043		5	0	0	0.1206133	0.1206133	225	102%	70	130	0%	
Silicon	A	mg/L	11.2483495	57.929		50	7.0498	0	0.2511580	0.2511580	450	102%	70	130	0%	
Silver	A	mg/L	0.47518447	2.4472		2.5	0	0	0.0287438	0.0287438	2	98%	70	130	0%	
Sodium	A	mg/L	172.279612	887.24		250	623.37	0	1.1377053	1.1377053	4500	106%	70	130	0%	
Strontium	A	mg/L	1.14108738	5.8766		5	0.82103	0	0.0012446	0.01	18	101%	70	130	0%	
Tellurium	A	mg/L	1.00452427	5.1733		5	0	0	0.1555136	0.1555136	90	103%	70	130	0%	
Thallium	A	mg/L	0.93743689	4.8278		5	0	0	0.0599466	0.0599466	225	97%	70	130	0%	
Tin	A	mg/L	0.93332039	4.8066		5	0	0	0.0421607	0.0421607	225	96%	70	130	0%	
Titanium	A	mg/L	0.97168932	5.0042		5	0	0	0.0139872	0.0139872	225	100%	70	130	0%	
Uranium	A	mg/L	0.93172816	4.7984		5	0	0	0.5943216	0.5943216	900	96%	70	130	0%	
Vanadium	A	mg/L	0.98044660	5.0493		5	0	0	0.01888	0.01888	225	101%	70	130	0%	
Zinc	A	mg/L	0.96293204	4.9591		5	0	0	0.0120325	0.0120325	90	99%	70	130	0%	
Calcium, meq	C	meq/L	2.73917087	14.10673		0	1.1488976	0	0.0275339	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	4.99514563	25.725		25	0	0	0.1289152	0.1289152	1000	103%	70	130	0%	
Magnesium, meq	C	meq/L	4.36973049	22.504112		0	1.065785	0	0.0101230	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	1.38191604	7.1168676		0	0.4420736	0	0.0112603	0.02558	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684702	B18020258-001	200.7.8-W-D	MS2		2/6/2018 1:53:57	5.15	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silica	C	mg/L	24.0624693	123.921717		107	15.080932	0	0.5372772	0.5372772	2000	102%	70	130	0%	
Silicon as SiO2	C	mg/L	24.0624693	123.921717		107	15.080932	0	0.5372772	0.5372772	2000	102%	70	130	0%	
Sodium, meq	C	meq/L	7.49416311	38.59494		0	27.116595	0	0.0494902	0.0494902	1000	0%	0	0	0%	
Uranium, Activity	C	pCi/L	630.779961	3248.5168		0	0	0	402.35569	402.35569	30465	0%	0	0	0%	
Uranium, U3O8	C	mg/L		5.65731475		0	0	0	0.7007053	0.7007053	53.055	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684703	B18020258-001	200.7.8-W-D	MSD2		2/6/2018 1:57:29	5.15	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.75203883	24.473		25	0	24.447	0.0340331	0.0340331	18	98%	70	130	0%	
Antimony	A	mg/L	0.97908738	5.0423		5	0	5.0246	0.1834336	0.1834336	225	101%	70	130	0%	
Arsenic	A	mg/L	0.97345631	5.0133		5	0	5.0738	0.1193003	0.1193003	225	100%	70	130	1%	
Barium	A	mg/L	1.26097087	6.494		5	1.4207	6.5628	0.0020235	0.05	18	101%	70	130	1%	
Beryllium	A	mg/L	0.4847767	2.4966		2.5	0	2.5009	0.0011935	0.0011935	22.5	100%	70	130	0%	
Boron	A	mg/L	1.00757282	5.189		5	0.14453	5.191	0.0412249	0.05	450	101%	70	130	0%	
Cadmium	A	mg/L	0.48198058	2.4822		2.5	0	2.4856	0.0053191	0.0053191	90	99%	70	130	0%	
Calcium	A	mg/L	54.6563107	281.48		250	23.024	282.7	0.5517823	1	180	103%	70	130	0%	
Chromium	A	mg/L	0.96135922	4.951		5	0	4.9677	0.0054725	0.0054725	225	99%	70	130	0%	
Cobalt	A	mg/L	0.94248544	4.8538		5	0	4.8755	0.0173238	0.0173238	450	97%	70	130	0%	
Copper	A	mg/L	0.96161165	4.9523		5	0	4.9943	0.0251136	0.0251136	225	99%	70	130	1%	
Gold	A	mg/L	0.94904854	4.8876		5	0	4.9334	0.0975848	0.0975848	90	98%	70	130	1%	
Iron	A	mg/L	5.00116505	25.756		25	0	25.725	0.1289152	0.1289152	360	103%	70	130	0%	
Lead	A	mg/L	0.94005825	4.8413		5	0	4.8548	0.0966257	0.0966257	900	97%	70	130	0%	
Lithium	A	mg/L	1.02747573	5.2915		5	0.15021	5.3538	0.0304057	0.1	22.5	103%	70	130	1%	
Magnesium	A	mg/L	52.8058252	271.95		250	12.95	273.44	0.1230016	1	4500	104%	70	130	1%	
Manganese	A	mg/L	4.79514563	24.695		25	0.01071	24.712	0.0054842	0.0054842	45	99%	70	130	0%	
Mercury	A	mg/L	0.99535922	5.1261		5	0	5.1126	0.0519877	0.0519877	45	103%	70	130	0%	
Molybdenum	A	mg/L	0.95036893	4.8944		5	0	4.8942	0.0161022	0.0161022	225	98%	70	130	0%	
Nickel	A	mg/L	0.9491068	4.8879		5	0	4.8708	0.0064532	0.0064532	225	98%	70	130	0%	
Phosphorus	A	mg/L	9.96873786	51.339		50	0	51.565	0.2191141	0.2191141	360	103%	70	130	0%	
Potassium	A	mg/L	53.5669903	275.87		250	17.282	278.22	0.4401983	1	900	103%	70	130	1%	
Selenium	A	mg/L	0.99617476	5.1303		5	0	5.1043	0.1206133	0.1206133	225	103%	70	130	1%	
Silicon	A	mg/L	11.2658252	58.019		50	7.0498	57.929	0.2511580	0.2511580	450	102%	70	130	0%	
Silver	A	mg/L	0.47289320	2.4354		2.5	0	2.4472	0.0287438	0.0287438	2	97%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684703	B18020258-001	200.7.8-W-D	MSD2		2/6/2018 1:57:29	5.15	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Sodium	A	mg/L	170.553398	878.35		250	623.37	887.24	1.1377053	1.1377053	4500	102%	70	130	1%	
Strontium	A	mg/L	1.13384466	5.8393		5	0.82103	5.8766	0.0012446	0.01	18	100%	70	130	1%	
Tellurium	A	mg/L	0.99357282	5.1169		5	0	5.1733	0.1555136	0.1555136	90	102%	70	130	1%	
Thallium	A	mg/L	0.93289320	4.8044		5	0	4.8278	0.0599466	0.0599466	225	96%	70	130	0%	
Tin	A	mg/L	0.93281553	4.804		5	0	4.8066	0.0421607	0.0421607	225	96%	70	130	0%	
Titanium	A	mg/L	0.97297087	5.0108		5	0	5.0042	0.0139872	0.0139872	225	100%	70	130	0%	
Uranium	A	mg/L	0.90520388	4.6618		5	0	4.7984	0.5943216	0.5943216	900	93%	70	130	3%	
Vanadium	A	mg/L	0.98165049	5.0555		5	0	5.0493	0.01888	0.01888	225	101%	70	130	0%	
Zinc	A	mg/L	1.00887379	5.1957		5	0	4.9591	0.0120325	0.0120325	90	104%	70	130	5%	
Calcium, meq	C	meq/L	2.72734990	14.045852		0	1.1488976	14.10673	0.0275339	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	5.00116505	25.756		25	0	25.725	0.1289152	0.1289152	1000	103%	70	130	0%	
Magnesium, meq	C	meq/L	4.34591942	22.381485		0	1.065785	22.504112	0.0101230	0.0823	1000	0%	0	0	1%	
Potassium, meq	C	meq/L	1.37024361	7.0567546		0	0.4420736	7.1168676	0.0112603	0.02558	1000	0%	0	0	1%	
Silica	C	mg/L	24.0998534	124.114245		107	15.080932	123.92172	0.5372772	0.5372772	2000	102%	70	130	0%	
Silicon as SiO2	C	mg/L	24.0998534	124.114245		107	15.080932	123.92172	0.5372772	0.5372772	2000	102%	70	130	0%	
Sodium, meq	C	meq/L	7.41907282	38.208225		0	27.116595	38.59494	0.0494902	0.0494902	1000	0%	0	0	1%	
Uranium, Activity	C	pCi/L	612.823029	3156.0386		0	0	3248.5168	402.35569	402.35569	30465	0%	0	0	3%	
Uranium, U3O8	C	mg/L		5.49626331		0	0	5.6573147	0.7007053	0.7007053	53.055	0%	0	0	3%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684704	B18020258-002	200.7.8-W-D	SAMP		2/6/2018 2:01:03	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.31948	1.5974		0	0	0	0.0019645	0.05	18	0%	0	0	0%	
Boron	A	mg/L	0.038234	0.19117		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	4.5422	22.711		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.027058	0.13529		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	1.86986	9.3493		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	3.2478	16.239		0	0	0	0.427377	1	900	0%	0	0	0%	
Sodium	A	mg/L	104.84	524.2		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Strontium	A	mg/L	0.132028	0.66014		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	0.001998	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	0.000294	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.003564	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.00013	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684704	B18020258-002	200.7.8-W-D	SAMP		2/6/2018 2:01:03	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium	B	mg/L	0.00014	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	0.00038	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	0.00073	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	-0.001238	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	0.004944	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	0.00286	0		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.00286	0		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.005196	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.003338	0.01669		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Mercury	B	mg/L	-0.000266	0		0	0	0	0.0504735	0.0504735	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.000006	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	-0.000046	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.004858	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	-0.004508	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	3.36269405	16.8134702		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon	B	mg/L	1.57194	7.8597		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	3.36269405	16.8134702		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silver	B	mg/L	0.001534	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Tellurium	B	mg/L	0.012918	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	0.000042	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	0.003556	0		0	0	0	0.0409327	0.0409327	225	0%	0	0	0%	D
Titanium	B	mg/L	0.000532	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Vanadium	B	mg/L	0.000282	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.003448	0.01724		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	
Calcium, meq	C	meq/L	0.22665578	1.1332789		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.15388948	0.76944739		0	0	0	0.0098282	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.08307872	0.41539362		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	
Sodium, meq	C	meq/L	4.56054	22.8027		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684705	B18020258-003	200.7.8-W-D	SAMP		2/6/2018 2:05:01	2	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684705	B18020258-003	200.7.8-W-D	SAMP		2/6/2018 2:05:01	2	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.006395	0		0	0	0	0.0132167	0.03	18	0%	0	0	0%	
Barium	A	mg/L	0.52705	1.0541		0	0	0	0.0007858	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00011	0		0	0	0	0.0004635	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.090115	0.18023		0	0	0	0.0160097	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	12.509	25.018		0	0	0	0.2142844	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00045	0		0	0	0	0.0021252	0.005	225	0%	0	0	0%	
Lithium	A	mg/L	0.055005	0.11001		0	0	0	0.0118081	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	5.253	10.506		0	0	0	0.0477676	1	4500	0%	0	0	0%	
Nickel	A	mg/L	0.00118	0		0	0	0	0.0025061	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.007265	0		0	0	0	0.0850929	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	7.1555	14.311		0	0	0	0.1709508	1	900	0%	0	0	0%	
Silicon	A	mg/L	3.7494	7.4988		0	0	0	0.0975371	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	200.925	401.85		0	0	0	0.4418273	1	4500	0%	0	0	0%	
Strontium	A	mg/L	0.25159	0.50318		0	0	0	0.0004833	0.01	18	0%	0	0	0%	
Vanadium	A	mg/L	-0.000275	0		0	0	0	0.0073320	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.012505	0.02501		0	0	0	0.0046728	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	-0.003775	0		0	0	0	0.0712363	0.0712363	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.004395	0		0	0	0	0.0463302	0.0463302	225	0%	0	0	0%	D
Cadmium	B	mg/L	-0.00003	0		0	0	0	0.0020657	0.0020657	90	0%	0	0	0%	D
Cobalt	B	mg/L	0.000665	0		0	0	0	0.0067277	0.0067277	450	0%	0	0	0%	D
Copper	B	mg/L	0.001585	0		0	0	0	0.0097529	0.0097529	225	0%	0	0	0%	D
Gold	B	mg/L	-0.000855	0		0	0	0	0.0378970	0.0378970	90	0%	0	0	0%	D
Iron	B	mg/L	0.01237	0		0	0	0	0.0500641	0.0500641	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.01237	0		0	0	0	0.0500641	0.0500641	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.00377	0		0	0	0	0.0375245	0.0375245	900	0%	0	0	0%	D
Manganese	B	mg/L	0.00508	0.01016		0	0	0	0.0021298	0.0021298	45	0%	0	0	0%	D
Mercury	B	mg/L	-0.000365	0		0	0	0	0.0201894	0.0201894	45	0%	0	0	0%	D
Molybdenum	B	mg/L	-0.00027	0		0	0	0	0.0062533	0.0062533	225	0%	0	0	0%	D
Selenium	B	mg/L	0.006545	0		0	0	0	0.0468401	0.0468401	225	0%	0	0	0%	D
Silver	B	mg/L	-0.00069	0		0	0	0	0.0111627	0.0111627	2	0%	0	0	0%	D
Tellurium	B	mg/L	0.01522	0		0	0	0	0.0603936	0.0603936	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.00434	0		0	0	0	0.0232802	0.0232802	225	0%	0	0	0%	D
Tin	B	mg/L	0.002105	0		0	0	0	0.0163731	0.0163731	225	0%	0	0	0%	D
Titanium	B	mg/L	0.000635	0		0	0	0	0.0054319	0.0054319	225	0%	0	0	0%	
Uranium	B	mg/L	-0.05846	0		0	0	0	0.2308045	0.2308045	900	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684705	B18020258-003	200.7.8-W-D	SAMP		2/6/2018 2:05:01	2	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium, Activity	B	pCi/L	-39.57742	0		0	0	0	156.25464	156.25464	30465	0%	0	0	0%	D
Calcium, meq	C	meq/L	0.6241991	1.2483982		0	0	0	0.0106928	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.4323219	0.8646438		0	0	0	0.0039313	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.18303769	0.36607538		0	0	0	0.0043729	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	8.02071648	16.041433		0	0	0	0.2086514	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	8.02071648	16.041433		0	0	0	0.2086514	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	8.7402375	17.480475		0	0	0	0.0192195	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684706	B18020265-002	200.7.8-W-DW	SAMP		2/6/2018 2:08:59	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00534	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Barium	A	mg/L	0.03955	0.03955		0	0	0	0.0003929	0.05	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.00006	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.20512	0.20512		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	29.857	29.857		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.0003	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00004	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.00708	0.00708		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Lithium	A	mg/L	0.05835	0.05835		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	8.677	8.677		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Molybdenum	A	mg/L	0.00123	0		0	0	0	0.0031266	0.005	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00103	0		0	0	0	0.0012530	0.01	225	0%	0	0	0%	
Phosphorus	A	mg/L	-0.00218	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	3.2201	3.2201		0	0	0	0.0854754	1	900	0%	0	0	0%	
Silicon	A	mg/L	8.019	8.019		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	18.309	18.309		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Strontium	A	mg/L	0.25258	0.25258		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tin	A	mg/L	-0.00093	0		0	0	0	0.0081865	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00072	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.00059	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00205	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	0.00319	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.01269	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684706	B18020265-002	200.7.8-W-DW	SAMP		2/6/2018 2:08:59	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium	B	mg/L	0.00019	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Gold	B	mg/L	0.00241	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	DL
Iron	B	mg/L	0.00044	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	DL
Lead	B	mg/L	-0.00254	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.00224	0.00224		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	B	mg/L	0.00092	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Selenium	B	mg/L	0.00636	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.00096	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00119	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Silica	C	mg/L	17.16066	17.16066		0	0	0	0.1043647	0.214	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	17.16066	17.16066		0	0	0	0.1043647	0.214	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684707	B18020265-002	200.7.8-W-DW	SD		2/6/2018 2:12:47	5	R294307		0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.000662	0		0	0	0	0.0330418	0.0330418	18	0%	0	0		
Antimony	A	mg/L	-0.000512	0		0	0	0	0.1780909	0.1780909	225	0%	0	0		
Arsenic	A	mg/L	0.004258	0		0	0	0	0.1158255	0.1158255	225	0%	0	0		
Barium	A	mg/L	0.00799	0.03995		0	0	0.03955	0.0019645	0.05	18	0%	0	0		
Beryllium	A	mg/L	0.000088	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0		
Boron	A	mg/L	0.039212	0.19606		0	0	0.20512	0.0400242	0.05	450	0%	0	0		N
Cadmium	A	mg/L	-0.000056	0		0	0	0	0.0051642	0.0051642	90	0%	0	0		
Calcium	A	mg/L	5.9404	29.702		0	0	29.857	0.535711	1	180	0%	0	0	1%	
Chromium	A	mg/L	0.000334	0		0	0	0	0.0053131	0.0053131	225	0%	0	0		
Cobalt	A	mg/L	0.000518	0		0	0	0	0.0168193	0.0168193	450	0%	0	0		
Copper	A	mg/L	0.001302	0		0	0	0.00708	0.0243822	0.0243822	225	0%	0	0		
Gold	A	mg/L	0.00358	0		0	0	0	0.0947425	0.0947425	90	0%	0	0		
Iron	A	mg/L	-0.000098	0		0	0	0	0.1251603	0.1251603	360	0%	0	0		
Lead	A	mg/L	0.002858	0		0	0	0	0.0938113	0.0938113	900	0%	0	0		
Lithium	A	mg/L	0.011198	0.05599		0	0	0.05835	0.0295201	0.1	22.5	0%	0	0		N
Magnesium	A	mg/L	1.72104	8.6052		0	0	8.677	0.119419	1	4500	0%	0	0	1%	
Manganese	A	mg/L	0.000216	0		0	0	0.00224	0.0053244	0.0053244	45	0%	0	0		
Mercury	A	mg/L	-0.000398	0		0	0	0	0.0504735	0.0504735	45	0%	0	0		
Molybdenum	A	mg/L	0.00069	0		0	0	0	0.0156332	0.0156332	225	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684707	B18020265-002	200.7.8-W-DW	SD		2/6/2018 2:12:47	5	R294307		0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/L	-0.000494	0		0	0	0	0.0062652	0.01	225	0%	0	0		
Phosphorus	A	mg/L	-0.004968	0		0	0	0	0.2127322	0.2127322	360	0%	0	0		
Potassium	A	mg/L	0.66872	3.3436		0	0	3.2201	0.427377	1	900	0%	0	0		N
Selenium	A	mg/L	0.000806	0		0	0	0	0.1171003	0.1171003	225	0%	0	0		
Silicon	A	mg/L	1.56482	7.8241		0	0	8.019	0.2438427	0.2438427	450	0%	0	0	2%	
Silver	A	mg/L	0.000272	0		0	0	0	0.0279066	0.0279066	2	0%	0	0		
Sodium	A	mg/L	3.6836	18.418		0	0	18.309	1.1045682	1.1045682	4500	0%	0	0	1%	
Strontium	A	mg/L	0.050392	0.25196		0	0	0.25258	0.0012084	0.01	18	0%	0	0	0%	
Thallium	A	mg/L	0.00444	0		0	0	0	0.0582006	0.0582006	225	0%	0	0		
Tin	A	mg/L	-0.001092	0		0	0	0	0.0409327	0.05	225	0%	0	0		
Titanium	A	mg/L	0.000492	0		0	0	0	0.0135798	0.0135798	225	0%	0	0		
Uranium	A	mg/L	-0.04235	0		0	0	0	0.5770112	0.5770112	900	0%	0	0		
Vanadium	A	mg/L	0.000762	0		0	0	0	0.0183301	0.0183301	225	0%	0	0		
Zinc	A	mg/L	0.000844	0		0	0	0	0.0116821	0.0116821	90	0%	0	0		
Silica	C	mg/L	3.3487148	16.743574		0	0	17.16066	0.5218235	0.5218235	1000	0%	0	0	2%	
Silicon as SiO2	C	mg/L	3.3487148	16.743574		0	0	17.16066	0.5218235	0.5218235	1000	0%	0	0	2%	
Uranium, Activity	C	pCi/L	-28.3745	0		0	0	0	386.59752	386.59752	1000	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684708	B18020265-002	200.7.8-W-DW	MS2		2/6/2018 2:16:39	1.03	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.76436893	4.9073		5	0	0	0.0068066	0.03	18	98%	70	130	0%	
Antimony	A	mg/L	0.98514563	1.0147		1	0	0	0.0366867	0.0366867	225	101%	70	130	0%	
Arsenic	A	mg/L	0.98660194	1.0162		1	0	0	0.0238601	0.0238601	225	102%	70	130	0%	
Barium	A	mg/L	1.05533981	1.087		1	0.03955	0	0.0004047	0.05	18	105%	70	130	0%	
Beryllium	A	mg/L	0.47642718	0.49072		0.5	0	0	0.0002387	0.001	22.5	98%	70	130	0%	
Boron	A	mg/L	1.17543689	1.2107		1	0.20512	0	0.008245	0.05	450	101%	70	130	0%	
Cadmium	A	mg/L	0.49366019	0.50847		0.5	0	0	0.0010638	0.0010638	90	102%	70	130	0%	
Calcium	A	mg/L	79.1980583	81.574		50	29.857	0	0.1103565	1	180	103%	70	130	0%	
Chromium	A	mg/L	0.96396117	0.99288		1	0	0	0.0010945	0.005	225	99%	70	130	0%	
Cobalt	A	mg/L	0.95153398	0.98008		1	0	0	0.0034648	0.005	450	98%	70	130	0%	
Copper	A	mg/L	0.98407767	1.0136		1	0.00708	0	0.0050227	0.0050227	225	101%	70	130	0%	
Gold	A	mg/L	0.95458252	0.98322		1	0	0	0.019517	0.019517	90	98%	70	130	0%	
Iron	A	mg/L	4.96961165	5.1187		5	0	0	0.0257830	0.0257830	360	102%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684708	B18020265-002	200.7.8-W-DW	MS2		2/6/2018 2:16:39	1.03	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	0.94129126	0.96953		1	0	0	0.0193251	0.0193251	900	97%	70	130	0%	
Lithium	A	mg/L	1.08368932	1.1162		1	0.05835	0	0.0060811	0.1	22.5	106%	70	130	0%	
Magnesium	A	mg/L	60.1320388	61.936		50	8.677	0	0.0246003	1	4500	107%	70	130	0%	
Manganese	A	mg/L	4.82533981	4.9701		5	0.00224	0	0.0010968	0.0010968	45	99%	70	130	0%	
Mercury	A	mg/L	0.99067961	1.0204		0	0	0	0.0103975	0.0103975	45	0%	0	0	0%	
Molybdenum	A	mg/L	0.94760194	0.97603		1	0	0	0.0032204	0.005	225	98%	70	130	0%	
Nickel	A	mg/L	0.95389320	0.98251		1	0	0	0.0012906	0.01	225	98%	70	130	0%	
Phosphorus	A	mg/L	9.92038835	10.218		10	0	0	0.0438228	0.1	360	102%	70	130	0%	
Potassium	A	mg/L	54.9339806	56.582		50	3.2201	0	0.0880397	1	900	107%	70	130	0%	
Selenium	A	mg/L	0.99213592	1.0219		1	0	0	0.0241227	0.0241227	225	102%	70	130	0%	
Silicon	A	mg/L	17.5990291	18.127		10	8.019	0	0.0502316	0.1	450	101%	70	130	0%	
Silver	A	mg/L	0.41738835	0.42991		0.5	0	0	0.0057488	0.0057488	2	86%	70	130	0%	
Sodium	A	mg/L	69.5990291	71.687		50	18.309	0	0.2275411	1	4500	107%	70	130	0%	
Strontium	A	mg/L	1.22339806	1.2601		1	0.25258	0	0.0002489	0.01	18	101%	70	130	0%	
Thallium	A	mg/L	0.95631068	0.985		1	0	0	0.0119893	0.0119893	225	99%	70	130	0%	
Tin	A	mg/L	0.93201942	0.95998		1	0	0	0.0084321	0.05	225	96%	70	130	0%	
Titanium	A	mg/L	0.96919417	0.99827		1	0	0	0.0027974	0.005	225	100%	70	130	0%	
Uranium	A	mg/L	0.94240777	0.97068		0	0	0	0.1188643	0.1188643	900	0%	0	0	0%	
Vanadium	A	mg/L	0.98029126	1.0097		1	0	0	0.003776	0.01	225	101%	70	130	0%	
Zinc	A	mg/L	0.97951456	1.0089		1	0	0	0.0024065	0.01	90	101%	70	130	0%	
Silica	C	mg/L	37.6619223	38.79178		21.4	17.16066	0	0.1074956	0.214	1000	101%	70	130	0%	
Silicon as SiO2	C	mg/L	37.6619223	38.79178		21.4	17.16066	0	0.1074956	0.214	1000	101%	70	130	0%	
Uranium, Activity	C	pCi/L	631.413204	650.3556		0	0	0	79.639088	79.639088	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684709	B18020265-002	200.7.8-W-DW	MSD2		2/6/2018 2:20:18	1.03	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.72737864	4.8692		5	0	4.9073	0.0068066	0.03	18	97%	70	130	1%	
Antimony	A	mg/L	0.98126214	1.0107		1	0	1.0147	0.0366867	0.0366867	225	101%	70	130	0%	
Arsenic	A	mg/L	0.98116505	1.0106		1	0	1.0162	0.0238601	0.0238601	225	101%	70	130	1%	
Barium	A	mg/L	1.05048544	1.082		1	0.03955	1.087	0.0004047	0.05	18	104%	70	130	0%	
Beryllium	A	mg/L	0.47378641	0.488		0.5	0	0.49072	0.0002387	0.001	22.5	98%	70	130	1%	
Boron	A	mg/L	1.17184466	1.207		1	0.20512	1.2107	0.008245	0.05	450	100%	70	130	0%	
Cadmium	A	mg/L	0.4917767	0.50653		0.5	0	0.50847	0.0010638	0.0010638	90	101%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684709	B18020265-002	200.7.8-W-DW	MSD2		2/6/2018 2:20:18	1.03	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	mg/L	78.7611650	81.124		50	29.857	81.574	0.1103565	1	180	103%	70	130	1%	
Chromium	A	mg/L	0.96141748	0.99026		1	0	0.99288	0.0010945	0.005	225	99%	70	130	0%	
Cobalt	A	mg/L	0.949	0.97747		1	0	0.98008	0.0034648	0.005	450	98%	70	130	0%	
Copper	A	mg/L	0.98203883	1.0115		1	0.00708	1.0136	0.0050227	0.0050227	225	100%	70	130	0%	
Gold	A	mg/L	0.96447573	0.99341		1	0	0.98322	0.019517	0.019517	90	99%	70	130	1%	
Iron	A	mg/L	4.91796117	5.0655		5	0	5.1187	0.0257830	0.0257830	360	101%	70	130	1%	
Lead	A	mg/L	0.94637864	0.97477		1	0	0.96953	0.0193251	0.0193251	900	97%	70	130	1%	
Lithium	A	mg/L	1.07883495	1.1112		1	0.05835	1.1162	0.0060811	0.1	22.5	105%	70	130	0%	
Magnesium	A	mg/L	59.7174757	61.509		50	8.677	61.936	0.0246003	1	4500	106%	70	130	1%	
Manganese	A	mg/L	4.79689320	4.9408		5	0.00224	4.9701	0.0010968	0.0010968	45	99%	70	130	1%	
Mercury	A	mg/L	0.98786408	1.0175		0	0	1.0204	0.0103975	0.0103975	45	0%	0	0	0%	
Molybdenum	A	mg/L	0.94368932	0.972		1	0	0.97603	0.0032204	0.005	225	97%	70	130	0%	
Nickel	A	mg/L	0.95198058	0.98054		1	0	0.98251	0.0012906	0.01	225	98%	70	130	0%	
Phosphorus	A	mg/L	9.86504854	10.161		10	0	10.218	0.0438228	0.1	360	102%	70	130	1%	
Potassium	A	mg/L	54.8135922	56.458		50	3.2201	56.582	0.0880397	1	900	106%	70	130	0%	
Selenium	A	mg/L	0.9907767	1.0205		1	0	1.0219	0.0241227	0.0241227	225	102%	70	130	0%	
Silicon	A	mg/L	17.5456311	18.072		10	8.019	18.127	0.0502316	0.1	450	101%	70	130	0%	
Silver	A	mg/L	0.36031068	0.37112		0.5	0	0.42991	0.0057488	0.0057488	2	74%	70	130	15%	
Sodium	A	mg/L	69.1058252	71.179		50	18.309	71.687	0.2275411	1	4500	106%	70	130	1%	
Strontium	A	mg/L	1.21922330	1.2558		1	0.25258	1.2601	0.0002489	0.01	18	100%	70	130	0%	
Thallium	A	mg/L	0.93824272	0.96639		1	0	0.985	0.0119893	0.0119893	225	97%	70	130	2%	
Tin	A	mg/L	0.93620388	0.96429		1	0	0.95998	0.0084321	0.05	225	96%	70	130	0%	
Titanium	A	mg/L	0.96502913	0.99398		1	0	0.99827	0.0027974	0.005	225	99%	70	130	0%	
Uranium	A	mg/L	0.9405534	0.96877		0	0	0.97068	0.1188643	0.1188643	900	0%	0	0	0%	
Vanadium	A	mg/L	0.97203883	1.0012		1	0	1.0097	0.003776	0.01	225	100%	70	130	1%	
Zinc	A	mg/L	0.97621359	1.0055		1	0	1.0089	0.0024065	0.01	90	101%	70	130	0%	
Silica	C	mg/L	37.5476505	38.67408		21.4	17.16066	38.79178	0.1074956	0.214	1000	101%	70	130	0%	
Silicon as SiO2	C	mg/L	37.5476505	38.67408		21.4	17.16066	38.79178	0.1074956	0.214	1000	101%	70	130	0%	
Uranium, Activity	C	pCi/L	630.170777	649.0759		0	0	650.3556	79.639088	79.639088	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684710	CCV	ICP-200.7-W-D	CCV		2/6/2018 2:24:01	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684710	CCV	ICP-200.7-W-D	CCV		2/6/2018 2:24:01	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.4774	2.4774		2.5	0	0	0.0066084	0.1	18	99%	90	110	0%	
Antimony	A	mg/L	2.4957	2.4957		2.5	0	0	0.0356182	0.05	225	100%	90	110	0%	
Arsenic	A	mg/L	2.5065	2.5065		2.5	0	0	0.0231651	0.1	225	100%	90	110	0%	
Barium	A	mg/L	2.6144	2.6144		2.5	0	0	0.0003929	0.1	18	105%	90	110	0%	
Beryllium	A	mg/L	1.2437	1.2437		1.25	0	0	0.0002318	0.01	22.5	99%	90	110	0%	
Boron	A	mg/L	2.4898	2.4898		2.5	0	0	0.0080048	0.1	450	100%	90	110	0%	
Cadmium	A	mg/L	2.5149	2.5149		2.5	0	0	0.0010328	0.01	90	101%	90	110	0%	
Calcium	A	mg/L	26.503	26.503		25	0	0	0.1071422	1	180	106%	90	110	0%	
Chromium	A	mg/L	2.5221	2.5221		2.5	0	0	0.0010626	0.05	225	101%	90	110	0%	
Cobalt	A	mg/L	2.5021	2.5021		2.5	0	0	0.0033639	0.02	450	100%	90	110	0%	
Copper	A	mg/L	2.55	2.55		2.5	0	0	0.0048764	0.01	225	102%	90	110	0%	
Gold	A	mg/L	2.5355	2.5355		2.5	0	0	0.0189485	0.1	90	101%	90	110	0%	
Iron	A	mg/L	2.5744	2.5744		2.5	0	0	0.0250321	0.0250321	360	103%	90	110	0%	
Lead	A	mg/L	2.4514	2.4514		2.5	0	0	0.0187623	0.05	900	98%	90	110	0%	
Lithium	A	mg/L	1.3216	1.3216		1.25	0	0	0.0059040	0.1	22.5	106%	90	110	0%	
Magnesium	A	mg/L	26.75	26.75		25	0	0	0.0116555	1	180	107%	90	110	0%	
Manganese	A	mg/L	2.4894	2.4894		2.5	0	0	0.0010649	0.01	45	100%	90	110	0%	
Mercury	A	mg/L	1.0348	1.0348		1	0	0	0.0100947	0.02	45	103%	90	110	0%	
Molybdenum	A	mg/L	2.4726	2.4726		2.5	0	0	0.0031266	0.1	225	99%	90	110	0%	
Nickel	A	mg/L	2.5293	2.5293		2.5	0	0	0.0012530	0.05	225	101%	90	110	0%	
Phosphorus	A	mg/L	2.5242	2.5242		2.5	0	0	0.0425464	0.1	360	101%	90	110	0%	
Potassium	A	mg/L	26.619	26.619		25	0	0	0.0854754	1	900	106%	90	110	0%	
Selenium	A	mg/L	2.5576	2.5576		2.5	0	0	0.0234201	0.1	225	102%	90	110	0%	
Silicon	A	mg/L	5.1217	5.1217		5	0	0	0.0487685	0.1	450	102%	90	110	0%	
Silver	A	mg/L	1.0528	1.0528		1	0	0	0.0055813	0.01	2	105%	90	110	0%	
Sodium	A	mg/L	26	26		25	0	0	0.1131395	1	450	104%	90	110	0%	
Strontium	A	mg/L	2.5765	2.5765		2.5	0	0	0.0002417	0.1	18	103%	90	110	0%	
Tellurium	A	mg/L	2.5383	2.5383		2.5	0	0	0.0301968	0.1	90	102%	90	110	0%	
Thallium	A	mg/L	2.4781	2.4781		2.5	0	0	0.0116401	0.5	225	99%	90	110	0%	
Tin	A	mg/L	2.4167	2.4167		2.5	0	0	0.0081865	0.1	225	97%	90	110	0%	
Titanium	A	mg/L	2.4678	2.4678		2.5	0	0	0.002716	0.01	225	99%	90	110	0%	
Uranium	A	mg/L	2.6095	2.6095		2.5	0	0	0.1154022	0.1154022	900	104%	90	110	0%	
Vanadium	A	mg/L	2.502	2.502		2.5	0	0	0.0036660	0.1	225	100%	90	110	0%	
Zinc	A	mg/L	2.4786	2.4786		2.5	0	0	0.0023364	0.01	90	99%	90	110	0%	
Silica	C	mg/L	10.9563406	10.9563406		10.7	0	0	0.1043257	0.21392	100	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684710	CCV	ICP-200.7-W-D	CCV		2/6/2018 2:24:01	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	10.9563406	10.9563406		10.7	0	0	0.1043257	0.21392	0	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684711	CCB	ICP-200.7-W-D	CCB		2/6/2018 2:27:44	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00022	0.00022		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.00065	-0.00065		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00022	0.00022		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00064	0.00064		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00032	0.00032		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.0016	0.0016		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00039	0.00039		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00607	0.00607		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00069	0.00069		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00092	0.00092		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00075	0.00075		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00655	0.00655		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	-0.00103	-0.00103		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00086	-0.00086		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00049	0.00049		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00605	0.00605		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.0005	0.0005		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00152	0.00152		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00119	0.00119		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0	0		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.00053	0.00053		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.01879	0.01879		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00058	0.00058		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	-0.00485	-0.00485		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00065	-0.00065		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0851	0.0851		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00047	0.00047		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01484	0.01484		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00117	0.00117		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684711	CCB	ICP-200.7-W-D	CCB		2/6/2018 2:27:44	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00407	0.00407		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.0011	0.0011		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.02522	-0.02522		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.0013	0.0013		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00055	0.00055		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	-0.0103751	-0.0103751		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	-0.0103751	-0.0103751		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685006	B18020265-003	200.7.8-W-DW	SAMP		2/6/2018 2:31:39	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.07437	0.07437		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Barium	A	mg/L	0.04345	0.04345		0	0	0	0.0003929	0.05	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.00012	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.20628	0.20628		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	31.846	31.846		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00027	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00005	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.00045	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Lithium	A	mg/L	0.0587	0.0587		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	9.3215	9.3215		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Molybdenum	A	mg/L	0.0019	0		0	0	0	0.0031266	0.005	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00004	0		0	0	0	0.0012530	0.01	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.00703	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	3.3499	3.3499		0	0	0	0.0854754	1	900	0%	0	0	0%	
Silicon	A	mg/L	8.3174	8.3174		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	19.155	19.155		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Strontium	A	mg/L	0.27452	0.27452		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00026	0		0	0	0	0.0081865	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00254	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.00119	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00082	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	-0.00245	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.01582	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685006	B18020265-003	200.7.8-W-DW	SAMP		2/6/2018 2:31:39	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium	B	mg/L	0.00019	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Gold	B	mg/L	0.00519	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	DL
Iron	B	mg/L	0.05145	0.05145		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	DL
Lead	B	mg/L	-0.00536	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.00452	0.00452		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	B	mg/L	0.00117	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Selenium	B	mg/L	0.00614	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.00185	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00579	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Uranium	B	mg/L	-0.05022	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	-33.6474	0		0	0	0	77.319503	77.319503	1000	0%	0	0	0%	DL
Silica	C	mg/L	17.799236	17.799236		0	0	0	0.1043647	0.214	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	17.799236	17.799236		0	0	0	0.1043647	0.214	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685007	B18020266-001	200.7.8-W-D	SAMP		2/6/2018 2:35:28	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.07147	0.07147		0	0	0	0.0066084	0.009	18	0%	0	0	0%	
Barium	A	mg/L	0.04132	0.04132		0	0	0	0.0003929	0.05	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.00013	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.20326	0.20326		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Cobalt	A	mg/L	0.00043	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Lithium	A	mg/L	0.05888	0.05888		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	J
Phosphorus	A	mg/L	0.00197	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Sodium	A	mg/L	18.826	18.826		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Titanium	A	mg/L	0.00079	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.00027	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Antimony	B	mg/L	0.00649	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00917	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	-0.0003	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Calcium	B	mg/L	30.377	30.377		0	0	0	0.1071422	1	180	0%	0	0	0%	
Calcium, meq	B	meq/L	1.5158123	1.5158123		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Chromium	B	mg/L	0.00016	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Copper	B	mg/L	0.00097	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685007	B18020266-001	200.7.8-W-D	SAMP		2/6/2018 2:35:28	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Gold	B	mg/L	0.00179	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	DL
Iron	B	mg/L	0.00663	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	DL
Iron, Ferrous	B	mg/L	0.00663	0		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	DL
Lead	B	mg/L	-0.00584	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Magnesium	B	mg/L	8.8763	8.8763		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Magnesium, meq	B	meq/L	0.73051949	0.73051949		0	0	0	0.0019656	0.0823	1000	0%	0	0	0%	
Manganese	B	mg/L	0.00301	0.00301		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	B	mg/L	-0.00066	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00154	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Nickel	B	mg/L	-0.00016	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Potassium	B	mg/L	3.266	3.266		0	0	0	0.0854754	1	900	0%	0	0	0%	
Potassium, meq	B	meq/L	0.08354428	0.08354428		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Selenium	B	mg/L	-0.00252	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silica	B	mg/L	17.1035458	17.1035458		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon	B	mg/L	7.9953	7.9953		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silicon as SiO2	B	mg/L	17.1035458	17.1035458		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silver	B	mg/L	-0.0004	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Strontium	B	mg/L	0.26235	0.26235		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tellurium	B	mg/L	0.01611	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	0.00286	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Tin	B	mg/L	-0.0007	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Uranium	B	mg/L	-0.03211	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	-21.73847	0		0	0	0	78.127319	78.127319	30465	0%	0	0	0%	DL
Zinc	B	mg/L	0.0019	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Sodium, meq	C	meq/L	0.818931	0.818931		0	0	0	0.0096097	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685008	B18020273-001	200.7.8-W-D	SAMP		2/6/2018 2:39:17	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.007148	0.03574		0	0	0	0.0019645	0.05	18	0%	0	0	0%	J
Boron	A	mg/L	0.04716	0.2358		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	65.398	326.99		0	0	0	0.535711	1	180	0%	0	0	0%	
Iron	A	mg/L	0.39942	1.9971		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Lithium	A	mg/L	0.005678	0		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685008	B18020273-001	200.7.8-W-D	SAMP		2/6/2018 2:39:17	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium	A	mg/L	38.946	194.73		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	1.19916	5.9958		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.60132	3.0066		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	-0.000602	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	-0.000026	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.00571	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000146	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.000282	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	-0.00052	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	0.00929	0.04645		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	0.000786	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	-0.003906	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Lead	B	mg/L	-0.00237	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	1.64272	8.2136		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Mercury	B	mg/L	-0.000438	0		0	0	0	0.0504735	0.0504735	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.000564	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.00591	0.02955		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.003356	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	-0.002848	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	3.67257856	18.3628928		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon	B	mg/L	1.7168	8.584		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	3.67257856	18.3628928		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silver	B	mg/L	-0.001218	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	158.094	790.47		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	6.877089	34.385445		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D
Tellurium	B	mg/L	0.017642	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	0.001464	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	0.000252	0		0	0	0	0.0409327	0.0409327	225	0%	0	0	0%	D
Titanium	B	mg/L	0.002578	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.06622	0		0	0	0	0.5770112	0.5770112	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/L	-44.83094	0		0	0	0	390.63659	390.63659	30465	0%	0	0	0%	D
Vanadium	B	mg/L	0.002014	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.001232	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	
Calcium, meq	C	meq/L	3.2633602	16.316801		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.39942	1.9971		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685008	B18020273-001	200.7.8-W-D	SAMP		2/6/2018 2:39:17	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium, meq	C	meq/L	3.2052558	16.026279		0	0	0	0.0098282	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.03067451	0.15337256		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685009	B18020273-002	200.7.8-W-D	SAMP		2/6/2018 2:43:15	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.005798	0.02899		0	0	0	0.0019645	0.05	18	0%	0	0	0%	J
Boron	A	mg/L	0.006506	0		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	20.83	104.15		0	0	0	0.535711	1	180	0%	0	0	0%	
Iron	A	mg/L	0.2747	1.3735		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Lithium	A	mg/L	0.001934	0		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	10.1144	50.572		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	0.29118	1.4559		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.157474	0.78737		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	0.000008	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	0.00099	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.002896	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000114	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.000004	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	0.00033	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	0.000614	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	-0.000226	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	-0.003672	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Lead	B	mg/L	-0.007022	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.22526	1.1263		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Mercury	B	mg/L	0.001262	0		0	0	0	0.0504735	0.0504735	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.000112	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.000408	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.002346	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	0.005698	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	2.41104954	12.0552477		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon	B	mg/L	1.12708	5.6354		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	2.41104954	12.0552477		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silver	B	mg/L	-0.001248	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685009	B18020273-002	200.7.8-W-D	SAMP		2/6/2018 2:43:15	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Sodium	B	mg/L	44.04	220.2		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	1.91574	9.5787		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D
Tellurium	B	mg/L	0.014534	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.001958	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	0.001268	0		0	0	0	0.0409327	0.0409327	225	0%	0	0	0%	D
Titanium	B	mg/L	0.000576	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.073622	0		0	0	0	0.5770112	0.5770112	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/L	-49.842094	0		0	0	0	390.63659	390.63659	30465	0%	0	0	0%	D
Vanadium	B	mg/L	0.000284	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.000204	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	
Calcium, meq	C	meq/L	1.039417	5.197085		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.2747	1.3735		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Magnesium, meq	C	meq/L	0.83241512	4.1620756		0	0	0	0.0098282	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00744838	0.03724192		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685010	B18020273-003	200.7.8-W-D	SAMP		2/6/2018 2:47:04	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.008836	0.04418		0	0	0	0.0019645	0.05	18	0%	0	0	0%	J
Boron	A	mg/L	0.004814	0		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	15.0738	75.369		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.00112	0		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	6.9812	34.906		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	0.32206	1.6103		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.150672	0.75336		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	0.0005	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	0.00153	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.004532	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000106	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.000042	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	-0.000196	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	0.000388	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	-0.00054	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	0.00034	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685010	B18020273-003	200.7.8-W-D	SAMP		2/6/2018 2:47:04	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	B	mg/L	0.002534	0		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.002534	0		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.005636	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.095314	0.47657		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Mercury	B	mg/L	-0.000166	0		0	0	0	0.0504735	0.0504735	45	0%	0	0	0%	D
Molybdenum	B	mg/L	-0.000196	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.00081	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.00221	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	-0.001098	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	2.69115638	13.4557819		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon	B	mg/L	1.25802	6.2901		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	2.69115638	13.4557819		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silver	B	mg/L	-0.00073	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	37.036	185.18		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	1.611066	8.05533		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D
Tellurium	B	mg/L	0.016564	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.001616	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	-0.000472	0		0	0	0	0.0409327	0.0409327	225	0%	0	0	0%	D
Titanium	B	mg/L	0.000786	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.056006	0		0	0	0	0.5770112	0.5770112	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/L	-37.916062	0		0	0	0	390.63659	390.63659	30465	0%	0	0	0%	D
Vanadium	B	mg/L	-0.000054	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.000144	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	
Calcium, meq	C	meq/L	0.75218262	3.7609131		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.57455276	2.8727638		0	0	0	0.0098282	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00823829	0.04119147		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685011	B18020273-004	200.7.8-W-D	SAMP		2/6/2018 2:50:53	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.008722	0.04361		0	0	0	0.0019645	0.05	18	0%	0	0	0%	J
Boron	A	mg/L	0.004006	0		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	15.022	75.11		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.000552	0		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685011	B18020273-004	200.7.8-W-D	SAMP		2/6/2018 2:50:53	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium	A	mg/L	6.9746	34.873		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	0.31998	1.5999		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.149978	0.74989		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	-0.000148	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	0.00174	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.000328	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000114	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000252	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	0.000258	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	0.001064	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	-0.00056	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	-0.004248	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	0.001848	0		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.001848	0		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.008704	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.090036	0.45018		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Mercury	B	mg/L	0.000036	0		0	0	0	0.0504735	0.0504735	45	0%	0	0	0%	D
Molybdenum	B	mg/L	-0.000892	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.000182	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	-0.000468	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	-0.003856	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	2.66398854	13.3199427		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon	B	mg/L	1.24532	6.2266		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	2.66398854	13.3199427		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silver	B	mg/L	0.000804	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	37.024	185.12		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	1.610544	8.05272		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D
Tellurium	B	mg/L	0.015072	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	0.000384	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	0.000514	0		0	0	0	0.0409327	0.0409327	225	0%	0	0	0%	D
Titanium	B	mg/L	0.001144	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.04738	0		0	0	0	0.5770112	0.5770112	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/L	-32.07626	0		0	0	0	390.63659	390.63659	30465	0%	0	0	0%	D
Vanadium	B	mg/L	0.000538	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.00059	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685011	B18020273-004	200.7.8-W-D	SAMP		2/6/2018 2:50:53	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium, meq	C	meq/L	0.7495978	3.747989		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.57400958	2.8700479		0	0	0	0.0098282	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00818509	0.04092544		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685012	B18020273-005	200.7.8-W-D	SAMP		2/6/2018 2:54:42	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.054732	0.27366		0	0	0	0.0019645	0.05	18	0%	0	0	0%	
Boron	A	mg/L	0.005134	0		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	20.762	103.81		0	0	0	0.535711	1	180	0%	0	0	0%	
Iron	A	mg/L	1.63938	8.1969		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Lithium	A	mg/L	0.0019	0		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	12.2512	61.256		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	1.89302	9.4651		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.2476	1.238		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	0.002254	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	-0.000136	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.003378	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.00014	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.00015	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	-0.000224	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	0.00366	0.0183		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	0.000812	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Gold	B	mg/L	0.000868	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Lead	B	mg/L	-0.003476	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	0.38376	1.9188		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Mercury	B	mg/L	0.0007	0		0	0	0	0.0504735	0.0504735	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.001086	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.002984	0.01492		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.49618	2.4809		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	0.004474	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	5.1319408	25.659704		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon	B	mg/L	2.399	11.995		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	5.1319408	25.659704		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685012	B18020273-005	200.7.8-W-D	SAMP		2/6/2018 2:54:42	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	B	mg/L	-0.001318	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	45.326	226.63		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	1.971681	9.858405		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D
Tellurium	B	mg/L	0.017264	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.003714	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	0.002646	0		0	0	0	0.0409327	0.0409327	225	0%	0	0	0%	D
Titanium	B	mg/L	0.000872	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.060462	0		0	0	0	0.5770112	0.5770112	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/L	-40.932774	0		0	0	0	390.63659	390.63659	30465	0%	0	0	0%	D
Vanadium	B	mg/L	0.000322	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	0.07292	0.3646		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	
Calcium, meq	C	meq/L	1.0360238	5.180119		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	1.63938	8.1969		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Magnesium, meq	C	meq/L	1.00827376	5.0413688		0	0	0	0.0098282	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.04842345	0.24211726		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685013	B18020273-006	200.7.8-W-D	SAMP		2/6/2018 2:58:29	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.00013	0		0	0	0	0.0019645	0.05	18	0%	0	0	0%	
Boron	A	mg/L	-0.002336	0		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	0.042868	0		0	0	0	0.535711	1	180	0%	0	0	0%	
Lithium	A	mg/L	-0.000292	0		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.005352	0		0	0	0	0.119419	1	4500	0%	0	0	0%	
Potassium	A	mg/L	0.0234	0		0	0	0	0.427377	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.000056	0		0	0	0	0.0012084	0.01	18	0%	0	0	0%	
Aluminum	B	mg/L	-0.000864	0		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	0.000024	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.005778	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.000094	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000362	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Chromium	B	mg/L	0.00016	0		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	0.000334	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	-0.00034	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685013	B18020273-006	200.7.8-W-D	SAMP		2/6/2018 2:58:29	5	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Gold	B	mg/L	0.002594	0		0	0	0	0.0947425	0.0947425	90	0%	0	0	0%	D
Iron	B	mg/L	0.000456	0		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.000456	0		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.003658	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Manganese	B	mg/L	-0.000086	0		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Mercury	B	mg/L	-0.000182	0		0	0	0	0.0504735	0.0504735	45	0%	0	0	0%	D
Molybdenum	B	mg/L	-0.000014	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	0.000096	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	-0.003432	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Selenium	B	mg/L	-0.001118	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silica	B	mg/L	0.02100694	0		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon	B	mg/L	0.00982	0		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	0.02100694	0		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silver	B	mg/L	-0.00211	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	0.082374	0		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	0.00358327	0		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D
Tellurium	B	mg/L	0.017424	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.00297	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	0.002688	0		0	0	0	0.0409327	0.0409327	225	0%	0	0	0%	D
Titanium	B	mg/L	0.00058	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.05209	0		0	0	0	0.5770112	0.5770112	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/L	-35.26493	0		0	0	0	390.63659	390.63659	30465	0%	0	0	0%	D
Vanadium	B	mg/L	-0.00006	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Zinc	B	mg/L	-0.000102	0		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	
Calcium, meq	C	meq/L	0.00213911	0		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.00044047	0		0	0	0	0.0098282	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00059857	0		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685014	B18020299-001	200.7.8-W-D	SAMP		2/6/2018 3:02:23	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01775	0.01775		0	0	0	0.0066084	0.03	18	0%	0	0	0%	J
Barium	A	mg/L	0.19074	0.19074		0	0	0	0.0003929	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00006	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685014	B18020299-001	200.7.8-W-D	SAMP		2/6/2018 3:02:23	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.22909	0.22909		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	102.62	102.62		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00019	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00044	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.0019	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Lithium	A	mg/L	0.05506	0.05506		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	28.073	28.073		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Nickel	A	mg/L	0.0006	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.02516	0		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	2.8296	2.8296		0	0	0	0.0854754	1	900	0%	0	0	0%	
Silicon	A	mg/L	6.0668	6.0668		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	101.51	101.51		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Strontium	A	mg/L	0.48705	0.48705		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00365	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Titanium	A	mg/L	0.00329	0.00329		0	0	0	0.002716	0.005	225	0%	0	0	0%	J
Vanadium	A	mg/L	0.00201	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.01589	0.01589		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	-0.00192	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00821	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	-0.00003	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Gold	B	mg/L	0.00136	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	DL
Iron	B	mg/L	0.0147	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	DL
Iron, Ferrous	B	mg/L	0.0147	0		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	DL
Lead	B	mg/L	0.00337	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.00515	0.00515		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	B	mg/L	0.00032	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00189	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Selenium	B	mg/L	0.00134	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	0.00071	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Tellurium	B	mg/L	0.01385	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00393	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Uranium	B	mg/L	-0.06428	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	-43.51756	0		0	0	0	78.127319	78.127319	30465	0%	0	0	0%	DL
Calcium, meq	C	meq/L	5.120738	5.120738		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	2.3104079	2.3104079		0	0	0	0.0019656	0.0823	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685014	B18020299-001	200.7.8-W-D	SAMP		2/6/2018 3:02:23	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium, meq	C	meq/L	0.07238117	0.07238117		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	12.9780986	12.9780986		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	12.9780986	12.9780986		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	4.415685	4.415685		0	0	0	0.0096097	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685015	B18020299-001	200.7.8-W-D	MS2		2/6/2018 3:06:20	1.03	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.58631068	4.7239		5	0.01775	0	0.0068066	0.03	18	94%	70	130	0%	
Antimony	A	mg/L	0.96844660	0.9975		1	0	0	0.0366867	0.0366867	225	100%	70	130	0%	
Arsenic	A	mg/L	0.98563107	1.0152		1	0	0	0.0238601	0.0238601	225	102%	70	130	0%	
Barium	A	mg/L	1.19941748	1.2354		1	0.19074	0	0.0004047	0.05	18	104%	70	130	0%	
Beryllium	A	mg/L	0.47216505	0.48633		0.5	0	0	0.0002387	0.001	22.5	97%	70	130	0%	
Boron	A	mg/L	1.19621359	1.2321		1	0.22909	0	0.008245	0.05	450	100%	70	130	0%	
Cadmium	A	mg/L	0.48564078	0.50021		0.5	0	0	0.0010638	0.0010638	90	100%	70	130	0%	
Calcium	A	mg/L	146.718447	151.12		50	102.62	0	0.1103565	1	180	97%	70	130	0%	
Chromium	A	mg/L	0.94705825	0.97547		1	0	0	0.0010945	0.005	225	98%	70	130	0%	
Cobalt	A	mg/L	0.93022330	0.95813		1	0	0	0.0034648	0.005	450	96%	70	130	0%	
Copper	A	mg/L	0.97902913	1.0084		1	0	0	0.0050227	0.0050227	225	101%	70	130	0%	
Gold	A	mg/L	0.9267767	0.95458		1	0	0	0.019517	0.019517	90	95%	70	130	0%	
Iron	A	mg/L	4.88922330	5.0359		5	0	0	0.0257830	0.0257830	360	101%	70	130	0%	
Lead	A	mg/L	0.92232039	0.94999		1	0	0	0.0193251	0.0193251	900	95%	70	130	0%	
Lithium	A	mg/L	1.09194175	1.1247		1	0.05506	0	0.0060811	0.1	22.5	107%	70	130	0%	
Magnesium	A	mg/L	78.3359223	80.686		50	28.073	0	0.0246003	1	4500	105%	70	130	0%	
Manganese	A	mg/L	4.74300971	4.8853		5	0.00515	0	0.0010968	0.0010968	45	98%	70	130	0%	
Mercury	A	mg/L	0.96512621	0.99408		1	0	0	0.0103975	0.0103975	45	99%	70	130	0%	
Molybdenum	A	mg/L	0.92866990	0.95653		1	0	0	0.0032204	0.0032204	225	96%	70	130	0%	
Nickel	A	mg/L	0.92852427	0.95638		1	0	0	0.0012906	0.005	225	96%	70	130	0%	
Phosphorus	A	mg/L	9.91553398	10.213		10	0	0	0.0438228	0.1	360	102%	70	130	0%	
Potassium	A	mg/L	55.0475728	56.699		50	2.8296	0	0.0880397	1	900	108%	70	130	0%	
Selenium	A	mg/L	1.02514563	1.0559		1	0	0	0.0241227	0.0241227	225	106%	70	130	0%	
Silicon	A	mg/L	15.8145631	16.289		10	6.0668	0	0.0502316	0.1	450	102%	70	130	0%	
Silver	A	mg/L	0.44035922	0.45357		0.5	0	0	0.0057488	0.0057488	2	91%	70	130	0%	
Sodium	A	mg/L	149.359223	153.84		50	101.51	0	0.2275411	1	4500	105%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685015	B18020299-001	200.7.8-W-D	MS2		2/6/2018 3:06:20	1.03	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium	A	mg/L	1.44029126	1.4835		1	0.48705	0	0.0002489	0.01	18	100%	70	130	0%	
Tellurium	A	mg/L	1.00097087	1.031		1	0	0	0.0311027	0.0311027	90	103%	70	130	0%	
Thallium	A	mg/L	0.91705825	0.94457		1	0	0	0.0119893	0.0119893	225	94%	70	130	0%	
Tin	A	mg/L	0.90828155	0.93553		1	0	0	0.0084321	0.01	225	94%	70	130	0%	
Titanium	A	mg/L	0.96613592	0.99512		1	0.00329	0	0.0027974	0.005	225	99%	70	130	0%	
Uranium	A	mg/L	0.93527184	0.96333		1	0	0	0.1188643	0.1188643	900	96%	70	130	0%	
Vanadium	A	mg/L	0.96543689	0.9944		1	0	0	0.003776	0.01	225	99%	70	130	0%	
Zinc	A	mg/L	0.97689320	1.0062		1	0.01589	0	0.0024065	0.01	90	99%	70	130	0%	
Calcium, meq	C	meq/L	7.32125049	7.540888		0	5.120738	0	0.0055068	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	4.88922330	5.0359		5	0	0	0.0257830	0.0257830	1000	101%	70	130	0%	
Magnesium, meq	C	meq/L	6.44704641	6.6404578		0	2.3104079	0	0.0020246	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	1.40811691	1.45036042		0	0.0723812	0	0.0022521	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	33.8305134	34.8454288		21.4	12.978099	0	0.1074554	0.21392	2000	102%	70	130	0%	
Silicon as SiO2	C	mg/L	33.8305134	34.8454288		21.4	12.978099	0	0.1074554	0.21392	2000	102%	70	130	0%	
Sodium, meq	C	meq/L	6.49712621	6.69204		0	4.415685	0	0.0098980	0.0435	1000	0%	0	0	0%	
Uranium, Activity	C	pCi/L	633.179039	652.17441		0	0	0	80.471138	80.471138	30465	0%	0	0	0%	
Uranium, U3O8	C	mg/L		1.13576630		0	0	0	0.1401411	0.1401411	53.055	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685016	CCV	ICP-200.7-W-D	CCV		2/6/2018 3:10:20	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.519	2.519		2.5	0	0	0.0066084	0.1	18	101%	90	110	0%	
Antimony	A	mg/L	2.5225	2.5225		2.5	0	0	0.0356182	0.05	225	101%	90	110	0%	
Arsenic	A	mg/L	2.5196	2.5196		2.5	0	0	0.0231651	0.1	225	101%	90	110	0%	
Barium	A	mg/L	2.6474	2.6474		2.5	0	0	0.0003929	0.1	18	106%	90	110	0%	
Beryllium	A	mg/L	1.2508	1.2508		1.25	0	0	0.0002318	0.01	22.5	100%	90	110	0%	
Boron	A	mg/L	2.5085	2.5085		2.5	0	0	0.0080048	0.1	450	100%	90	110	0%	
Cadmium	A	mg/L	2.5313	2.5313		2.5	0	0	0.0010328	0.01	90	101%	90	110	0%	
Calcium	A	mg/L	26.704	26.704		25	0	0	0.1071422	1	180	107%	90	110	0%	
Chromium	A	mg/L	2.5431	2.5431		2.5	0	0	0.0010626	0.05	225	102%	90	110	0%	
Cobalt	A	mg/L	2.5213	2.5213		2.5	0	0	0.0033639	0.02	450	101%	90	110	0%	
Copper	A	mg/L	2.567	2.567		2.5	0	0	0.0048764	0.01	225	103%	90	110	0%	
Gold	A	mg/L	2.5448	2.5448		2.5	0	0	0.0189485	0.1	90	102%	90	110	0%	
Iron	A	mg/L	2.5999	2.5999		2.5	0	0	0.0250321	0.0250321	360	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685016	CCV	ICP-200.7-W-D	CCV		2/6/2018 3:10:20	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	2.4608	2.4608		2.5	0	0	0.0187623	0.05	900	98%	90	110	0%	
Lithium	A	mg/L	1.3341	1.3341		1.25	0	0	0.0059040	0.1	22.5	107%	90	110	0%	
Magnesium	A	mg/L	26.991	26.991		25	0	0	0.0116555	1	180	108%	90	110	0%	
Manganese	A	mg/L	2.5073	2.5073		2.5	0	0	0.0010649	0.01	45	100%	90	110	0%	
Mercury	A	mg/L	1.0405	1.0405		1	0	0	0.0100947	0.02	45	104%	90	110	0%	
Molybdenum	A	mg/L	2.4873	2.4873		2.5	0	0	0.0031266	0.1	225	99%	90	110	0%	
Nickel	A	mg/L	2.5497	2.5497		2.5	0	0	0.0012530	0.05	225	102%	90	110	0%	
Phosphorus	A	mg/L	2.5497	2.5497		2.5	0	0	0.0425464	0.1	360	102%	90	110	0%	
Potassium	A	mg/L	26.949	26.949		25	0	0	0.0854754	1	900	108%	90	110	0%	
Selenium	A	mg/L	2.5708	2.5708		2.5	0	0	0.0234201	0.1	225	103%	90	110	0%	
Silicon	A	mg/L	5.143	5.143		5	0	0	0.0487685	0.1	450	103%	90	110	0%	
Silver	A	mg/L	1.0509	1.0509		1	0	0	0.0055813	0.01	2	105%	90	110	0%	
Sodium	A	mg/L	26.27	26.27		25	0	0	0.1131395	1	450	105%	90	110	0%	
Strontium	A	mg/L	2.5802	2.5802		2.5	0	0	0.0002417	0.1	18	103%	90	110	0%	
Tellurium	A	mg/L	2.5554	2.5554		2.5	0	0	0.0301968	0.1	90	102%	90	110	0%	
Thallium	A	mg/L	2.4927	2.4927		2.5	0	0	0.0116401	0.5	225	100%	90	110	0%	
Tin	A	mg/L	2.429	2.429		2.5	0	0	0.0081865	0.1	225	97%	90	110	0%	
Titanium	A	mg/L	2.4838	2.4838		2.5	0	0	0.002716	0.01	225	99%	90	110	0%	
Uranium	A	mg/L	2.5548	2.5548		2.5	0	0	0.1154022	0.1154022	900	102%	90	110	0%	
Vanadium	A	mg/L	2.5178	2.5178		2.5	0	0	0.0036660	0.1	225	101%	90	110	0%	
Zinc	A	mg/L	2.4951	2.4951		2.5	0	0	0.0023364	0.01	90	100%	90	110	0%	
Silica	C	mg/L	11.0019056	11.0019056		10.7	0	0	0.1043257	0.21392	100	103%	90	110	0%	
Silicon as SiO2	C	mg/L	11.0019056	11.0019056		10.7	0	0	0.1043257	0.21392	0	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685017	CCB	ICP-200.7-W-D	CCB		2/6/2018 3:14:03	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00025	0.00025		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	0.00005	0.00005		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00562	0.00562		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00069	0.00069		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00032	0.00032		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.001	0.001		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00058	0.00058		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685017	CCB	ICP-200.7-W-D	CCB		2/6/2018 3:14:03	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	mg/L	0.00807	0.00807		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00071	0.00071		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00122	0.00122		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00132	0.00132		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00797	0.00797		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	-0.0002	-0.0002		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.0046	-0.0046		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00016	0.00016		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.0069	0.0069		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00041	0.00041		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00042	0.00042		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00167	0.00167		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0.0006	0.0006		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.00218	0.00218		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.02147	0.02147		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00043	0.00043		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.00691	0.00691		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00003	-0.00003		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0913	0.0913		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00051	0.00051		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.02014	0.02014		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.0021	-0.0021		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	0.00271	0.00271		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.0012	0.0012		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.03551	-0.03551		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00022	-0.00022		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00048	0.00048		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.01478187	0.01478187		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.01478187	0.01478187		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685018	Blank	ICP-200.7-W-D	ICAL		2/6/2018 3:17:57	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685018	Blank	ICP-200.7-W-D	ICAL		2/6/2018 3:17:57	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	Cts/S	0.3622	0.3622		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Antimony	A	Cts/S	2.5443	2.5443		0	0	0	0.0356182	0.05	225	0%	0	0	0%	
Arsenic	A	Cts/S	0.31109	0.31109		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	Cts/S	29.55	29.55		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	Cts/S	22.75	22.75		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	Cts/S	4.2833	4.2833		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	Cts/S	2.5909	2.5909		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	Cts/S	1.8354	1.8354		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	Cts/S	0.25109	0.25109		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	Cts/S	-3.0198	-3.0198		0	0	0	0.0033639	0.02	450	0%	0	0	0%	
Copper	A	Cts/S	8.2111	8.2111		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	Cts/S	2.4667	2.4667		0	0	0	0.0189485	0.1	90	0%	0	0	0%	
Iron	A	Cts/S	2.4333	2.4333		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lead	A	Cts/S	2.5473	2.5473		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Lithium	A	Cts/S	68.826	68.826		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	Cts/S	11.4	11.4		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	Cts/S	-1.05	-1.05		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Mercury	A	Cts/S	1.2888	1.2888		0	0	0	0.0100947	0.02	45	0%	0	0	0%	
Molybdenum	A	Cts/S	1.7221	1.7221		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Nickel	A	Cts/S	1.4044	1.4044		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	Cts/S	-0.2311	-0.2311		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	Cts/S	52.37	52.37		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	Cts/S	0.23332	0.23332		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	Cts/S	20.983	20.983		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silver	A	Cts/S	-2.4	-2.4		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	Cts/S	154.7	154.7		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	Cts/S	13.2	13.2		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tellurium	A	Cts/S	-5.8418	-5.8418		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	Cts/S	-0.37331	-0.37331		0	0	0	0.0116401	0.5	225	0%	0	0	0%	
Tin	A	Cts/S	-0.29109	-0.29109		0	0	0	0.0081865	0.1	225	0%	0	0	0%	
Titanium	A	Cts/S	151.9	151.9		0	0	0	0.002716	0.01	225	0%	0	0	0%	
Uranium	A	Cts/S	31.8	31.8		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	Cts/S	3.5167	3.5167		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	Cts/S	9.8349	9.8349		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	44.8868336	44.8868336		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685019	CalibStd-1	ICP-200.7-W-D	ICAL		2/6/2018 3:21:50	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	Cts/S	96724	96724		0	0	0	0.1071422	1	180	0%	0	0	0%	
Iron	A	Cts/S	8627.8	8627.8		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lithium	A	Cts/S	49481	49481		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	Cts/S	242340	242340		0	0	0	0.0116555	1	180	0%	0	0	0%	
Phosphorus	A	Cts/S	594.03	594.03		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	Cts/S	34610	34610		0	0	0	0.0854754	1	900	0%	0	0	0%	
Sodium	A	Cts/S	146800	146800		0	0	0	0.1131395	1	450	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685020	CalibStd-2	ICP-200.7-W-D	ICAL		2/6/2018 3:25:38	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	Cts/S	1120.8	1120.8		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Barium	A	Cts/S	682030	682030		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Chromium	A	Cts/S	6990.9	6990.9		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Copper	A	Cts/S	12990	12990		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	Cts/S	2911.6	2911.6		0	0	0	0.0189485	0.1	90	0%	0	0	0%	
Mercury	A	Cts/S	83.424	83.424		0	0	0	0.0100947	0.02	45	0%	0	0	0%	
Nickel	A	Cts/S	7357.4	7357.4		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Silver	A	Cts/S	565.99	565.99		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Tellurium	A	Cts/S	628.65	628.65		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	Cts/S	549.33	549.33		0	0	0	0.0116401	0.5	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685021	CalibStd-3	ICP-200.7-W-D	ICAL		2/6/2018 3:29:29	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	Cts/S	553.66	553.66		0	0	0	0.0356182	0.05	225	0%	0	0	0%	
Arsenic	A	Cts/S	492.01	492.01		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Beryllium	A	Cts/S	284130	284130		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	Cts/S	10903	10903		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	Cts/S	10295	10295		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Cobalt	A	Cts/S	6127.2	6127.2		0	0	0	0.0033639	0.02	450	0%	0	0	0%	
Lead	A	Cts/S	1054.7	1054.7		0	0	0	0.0187623	0.05	900	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685021	CalibStd-3	ICP-200.7-W-D	ICAL		2/6/2018 3:29:29	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	Cts/S	55759	55759		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	Cts/S	3249.9	3249.9		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Selenium	A	Cts/S	356.8	356.8		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	Cts/S	4574.9	4574.9		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Strontium	A	Cts/S	1113100	1113100		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tin	A	Cts/S	878.21	878.21		0	0	0	0.0081865	0.1	225	0%	0	0	0%	
Titanium	A	Cts/S	51938	51938		0	0	0	0.002716	0.01	225	0%	0	0	0%	
Vanadium	A	Cts/S	14391	14391		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	Cts/S	12083	12083		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	9786.62608	9786.62608		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685022	CalibStd-4	ICP-200.7-W-D	ICAL		2/6/2018 3:33:20	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	Cts/S	1137.2	1137.2		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685023	CCV	ICP-6010-W-D	CCV		2/6/2018 3:37:14	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5069	2.5069		2.5	0	0	0.0066084	0.1	18	100%	90	110	0%	
Antimony	A	mg/L	2.5197	2.5197		2.5	0	0	0.0356182	0.05	225	101%	90	110	0%	
Arsenic	A	mg/L	2.541	2.541		2.5	0	0	0.0231651	0.1	225	102%	90	110	0%	
Barium	A	mg/L	2.4972	2.4972		2.5	0	0	0.0003929	0.1	18	100%	90	110	0%	
Beryllium	A	mg/L	1.2575	1.2575		1.25	0	0	0.0002318	0.01	22.5	101%	90	110	0%	
Boron	A	mg/L	2.5067	2.5067		2.5	0	0	0.0080048	0.1	450	100%	90	110	0%	
Cadmium	A	mg/L	2.4916	2.4916		2.5	0	0	0.0010328	0.01	90	100%	90	110	0%	
Calcium	A	mg/L	26.002	26.002		25	0	0	0.1071422	1	180	104%	90	110	0%	
Chromium	A	mg/L	2.5031	2.5031		2.5	0	0	0.0010626	0.05	225	100%	90	110	0%	
Cobalt	A	mg/L	2.4802	2.4802		2.5	0	0	0.0033639	0.02	450	99%	90	110	0%	
Copper	A	mg/L	2.4514	2.4514		2.5	0	0	0.0048764	0.01	225	98%	90	110	0%	
Gold	A	mg/L	2.4489	2.4489		2.5	0	0	0.0189485	0.1	90	98%	90	110	0%	
Iron	A	mg/L	2.5822	2.5822		2.5	0	0	0.0250321	0.0250321	360	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685023	CCV	ICP-6010-W-D	CCV		2/6/2018 3:37:14	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	2.462	2.462		2.5	0	0	0.0187623	0.05	900	98%	90	110	0%	
Lithium	A	mg/L	1.2687	1.2687		1.25	0	0	0.0059040	0.1	22.5	101%	90	110	0%	
Magnesium	A	mg/L	25.753	25.753		25	0	0	0.0116555	1	180	103%	90	110	0%	
Manganese	A	mg/L	2.4768	2.4768		2.5	0	0	0.0010649	0.01	45	99%	90	110	0%	
Mercury	A	mg/L	1.0126	1.0126		1	0	0	0.0100947	0.02	45	101%	90	110	0%	
Molybdenum	A	mg/L	2.5186	2.5186		2.5	0	0	0.0031266	0.1	225	101%	90	110	0%	
Nickel	A	mg/L	2.4737	2.4737		2.5	0	0	0.0012530	0.05	225	99%	90	110	0%	
Phosphorus	A	mg/L	2.522	2.522		2.5	0	0	0.0425464	0.1	360	101%	90	110	0%	
Potassium	A	mg/L	25.481	25.481		25	0	0	0.0854754	1	900	102%	90	110	0%	
Selenium	A	mg/L	2.5074	2.5074		2.5	0	0	0.0234201	0.1	225	100%	90	110	0%	
Silicon	A	mg/L	5.0841	5.0841		5	0	0	0.0487685	0.1	450	102%	90	110	0%	
Silver	A	mg/L	1.0053	1.0053		1	0	0	0.0055813	0.01	2	101%	90	110	0%	
Sodium	A	mg/L	25.36	25.36		25	0	0	0.1131395	1	450	101%	90	110	0%	
Strontium	A	mg/L	2.5002	2.5002		2.5	0	0	0.0002417	0.1	18	100%	90	110	0%	
Tellurium	A	mg/L	2.4919	2.4919		2.5	0	0	0.0301968	0.1	90	100%	90	110	0%	
Thallium	A	mg/L	2.4452	2.4452		2.5	0	0	0.0116401	0.5	225	98%	90	110	0%	
Tin	A	mg/L	2.4689	2.4689		2.5	0	0	0.0081865	0.1	225	99%	90	110	0%	
Titanium	A	mg/L	2.4973	2.4973		2.5	0	0	0.002716	0.01	225	100%	90	110	0%	
Uranium	A	mg/L	2.5078	2.5078		2.5	0	0	0.1154022	0.1154022	900	100%	90	110	0%	
Vanadium	A	mg/L	2.5233	2.5233		2.5	0	0	0.0036660	0.1	225	101%	90	110	0%	
Zinc	A	mg/L	2.4891	2.4891		2.5	0	0	0.0023364	0.01	90	100%	90	110	0%	
Silica	C	mg/L	10.8759067	10.8759067		10.7	0	0	0.1043257	0.21392	100	102%	90	110	0%	
Silicon as SiO2	C	mg/L	10.879974	10.879974		10.7	0	0	0.1043647	0.214	0	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685024	CCB	ICP-6010-W-D	CCB		2/6/2018 3:40:55	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00015	0.00015		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.0006	-0.0006		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	-0.00058	-0.00058		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00054	0.00054		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00019	0.00019		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00333	0.00333		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00086	0.00086		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685024	CCB	ICP-6010-W-D	CCB		2/6/2018 3:40:55	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	mg/L	0.00546	0.00546		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	-0.00002	-0.00002		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00043	0.00043		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00044	0.00044		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00888	0.00888		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	-0.00068	-0.00068		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00378	-0.00378		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	-0.0001	-0.0001		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00497	0.00497		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00049	0.00049		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00013	0.00013		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00092	0.00092		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0.00015	0.00015		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.00172	0.00172		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.01651	0.01651		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00811	0.00811		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	-0.0109	-0.0109		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	0.00059	0.00059		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0812	0.0812		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.0005	0.0005		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01827	0.01827		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00292	0.00292		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	0.00273	0.00273		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00096	0.00096		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.03104	-0.03104		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00047	0.00047		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00078	0.00078		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	-0.0233173	-0.0233173		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	-0.023326	-0.023326		0	0	0	0.1043647	0.214	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685025	B18020299-001	200.7.8-W-D	MSD2		2/6/2018 3:44:50	1.03	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
11685025	B18020299-001	200.7.8-W-D	MSD2		2/6/2018 3:44:50	1.03	R294307		1E+07	1E+07					

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.59475728	4.7326		5	0.01775	4.7239	0.0068066	0.03	18	94%	70	130	0%	
Antimony	A	mg/L	0.98213592	1.0116		1	0	0.9975	0.0366867	0.0366867	225	101%	70	130	1%	
Arsenic	A	mg/L	1.00019417	1.0302		1	0	1.0152	0.0238601	0.0238601	225	103%	70	130	1%	
Barium	A	mg/L	1.14135922	1.1756		1	0.19074	1.2354	0.0004047	0.05	18	98%	70	130	5%	
Beryllium	A	mg/L	0.47862136	0.49298		0.5	0	0.48633	0.0002387	0.001	22.5	99%	70	130	1%	
Boron	A	mg/L	1.21669903	1.2532		1	0.22909	1.2321	0.008245	0.05	450	102%	70	130	2%	
Cadmium	A	mg/L	0.48156311	0.49601		0.5	0	0.50021	0.0010638	0.0010638	90	99%	70	130	1%	
Calcium	A	mg/L	143.320388	147.62		50	102.62	151.12	0.1103565	1	180	90%	70	130	2%	
Chromium	A	mg/L	0.941	0.96923		1	0	0.97547	0.0010945	0.005	225	97%	70	130	1%	
Cobalt	A	mg/L	0.91861165	0.94617		1	0	0.95813	0.0034648	0.005	450	95%	70	130	1%	
Copper	A	mg/L	0.94128155	0.96952		1	0	1.0084	0.0050227	0.0050227	225	97%	70	130	4%	
Gold	A	mg/L	0.89430097	0.92113		1	0	0.95458	0.019517	0.019517	90	92%	70	130	4%	
Iron	A	mg/L	4.94640777	5.0948		5	0	5.0359	0.0257830	0.0257830	360	102%	70	130	1%	
Lead	A	mg/L	0.91982524	0.94742		1	0	0.94999	0.0193251	0.0193251	900	95%	70	130	0%	
Lithium	A	mg/L	1.04864078	1.0801		1	0.05506	1.1247	0.0060811	0.1	22.5	103%	70	130	4%	
Magnesium	A	mg/L	75.3951456	77.657		50	28.073	80.686	0.0246003	1	4500	99%	70	130	4%	
Manganese	A	mg/L	4.70718447	4.8484		5	0.00515	4.8853	0.0010968	0.0010968	45	97%	70	130	1%	
Mercury	A	mg/L	0.9461068	0.97449		1	0	0.99408	0.0103975	0.0103975	45	97%	70	130	2%	
Molybdenum	A	mg/L	0.95184466	0.9804		1	0	0.95653	0.0032204	0.0032204	225	98%	70	130	2%	
Nickel	A	mg/L	0.90417476	0.9313		1	0	0.95638	0.0012906	0.005	225	93%	70	130	3%	
Phosphorus	A	mg/L	9.95631068	10.255		10	0	10.213	0.0438228	0.1	360	103%	70	130	0%	
Potassium	A	mg/L	52.2805825	53.849		50	2.8296	56.699	0.0880397	1	900	102%	70	130	5%	
Selenium	A	mg/L	0.99844660	1.0284		1	0	1.0559	0.0241227	0.0241227	225	103%	70	130	3%	
Silicon	A	mg/L	15.7281553	16.2		10	6.0668	16.289	0.0502316	0.1	450	101%	70	130	1%	
Silver	A	mg/L	0.40802913	0.42027		0.5	0	0.45357	0.0057488	0.0057488	2	84%	70	130	8%	
Sodium	A	mg/L	141.718447	145.97		50	101.51	153.84	0.2275411	1	4500	89%	70	130	5%	
Strontium	A	mg/L	1.39145631	1.4332		1	0.48705	1.4835	0.0002489	0.01	18	95%	70	130	3%	
Tellurium	A	mg/L	0.98339806	1.0129		1	0	1.031	0.0311027	0.0311027	90	101%	70	130	2%	
Thallium	A	mg/L	0.90945631	0.93674		1	0	0.94457	0.0119893	0.0119893	225	94%	70	130	1%	
Tin	A	mg/L	0.93322330	0.96122		1	0	0.93553	0.0084321	0.01	225	96%	70	130	3%	
Titanium	A	mg/L	0.97699029	1.0063		1	0.00329	0.99512	0.0027974	0.005	225	100%	70	130	1%	
Uranium	A	mg/L	0.90256311	0.92964		1	0	0.96333	0.1188643	0.1188643	900	93%	70	130	4%	
Vanadium	A	mg/L	0.97514563	1.0044		1	0	0.9944	0.003776	0.01	225	100%	70	130	1%	
Zinc	A	mg/L	0.98262136	1.0121		1	0.01589	1.0062	0.0024065	0.01	90	100%	70	130	1%	
Calcium, meq	C	meq/L	7.15168738	7.366238		0	5.120738	7.540888	0.0055068	0.0499	1000	0%	0	0	2%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685025	B18020299-001	200.7.8-W-D	MSD2		2/6/2018 3:44:50	1.03	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron, Ferrous	C	mg/L	4.94640777	5.0948		5	0	5.0359	0.0257830	0.0257830	1000	102%	70	130	1%	
Magnesium, meq	C	meq/L	6.20502049	6.3911711		0	2.3104079	6.6404578	0.0020246	0.0823	1000	0%	0	0	4%	
Potassium, meq	C	meq/L	1.33733730	1.37745742		0	0.0723812	1.4503604	0.0022521	0.02558	1000	0%	0	0	5%	
Silica	C	mg/L	33.6456699	34.65504		21.4	12.978099	34.845429	0.1074554	0.21392	2000	101%	70	130	1%	
Silicon as SiO2	C	mg/L	33.6456699	34.65504		21.4	12.978099	34.845429	0.1074554	0.21392	2000	101%	70	130	1%	
Sodium, meq	C	meq/L	6.16475243	6.349695		0	4.415685	6.69204	0.0098980	0.0435	1000	0%	0	0	5%	
Uranium, Activity	C	pCi/L	611.035223	629.36628		0	0	652.17441	80.471138	80.471138	30465	0%	0	0	4%	
Uranium, U3O8	C	mg/L		1.09604578		0	0	1.1357663	0.1401411	0.1401411	53.055	0%	0	0	4%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685026	MB-118169	ICP-6010-S-T	MBLK		2/6/2018 3:48:49	1	118169	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.00171	0		0	0	0	0.5921	10	900	0%	0	0	0%	
Antimony	A	mg/kg	-0.00102	0		0	0	0	0.5167	20	225	0%	0	0	0%	
Arsenic	A	mg/kg	-0.00429	0		0	0	0	0.968	20	225	0%	0	0	0%	
Barium	A	mg/kg	0.00037	0		0	0	0	0.0342	1	18	0%	0	0	0%	
Beryllium	A	mg/kg	0.00006	0		0	0	0	0.008364	1	22.5	0%	0	0	0%	
Boron	A	mg/kg	0.004	0		0	0	0	0.2683	5	450	0%	0	0	0%	
Cadmium	A	mg/kg	0.00048	0.024		0	0	0	0.02376	1	90	0%	0	0	0%	
Calcium	A	mg/kg	0.09769	4.8845		0	0	0	4.01	30	180	0%	0	0	0%	
Chromium	A	mg/kg	0.00144	0		0	0	0	0.09567	5	225	0%	0	0	0%	
Cobalt	A	mg/kg	0.00047	0		0	0	0	0.05758	4	450	0%	0	0	0%	
Copper	A	mg/kg	0.00039	0		0	0	0	0.09809	5	225	0%	0	0	0%	
Gold	A	mg/kg	0.0193	0.965		0	0	0	0.7983	10	90	0%	0	0	0%	
Iron	A	mg/kg	0.01232	0		0	0	0	2.162	10	360	0%	0	0	0%	
Lead	A	mg/kg	-0.00749	0		0	0	0	0.8555	20	900	0%	0	0	0%	
Lithium	A	mg/kg	-0.00076	0		0	0	0	0.07691	5	22.5	0%	0	0	0%	
Magnesium	A	mg/kg	0.01115	0.5575		0	0	0	0.2216	8	180	0%	0	0	0%	
Manganese	A	mg/kg	0.00072	0		0	0	0	0.06899	1	45	0%	0	0	0%	
Molybdenum	A	mg/kg	0.00114	0		0	0	0	0.1592	3	225	0%	0	0	0%	
Nickel	A	mg/kg	0.00072	0		0	0	0	0.1158	3	225	0%	0	0	0%	
Phosphorus	A	mg/kg	0.01781	0.8905		0	0	0	0.2754	20	360	0%	0	0	0%	
Potassium	A	mg/kg	0.05342	2.671		0	0	0	2.507	50	900	0%	0	0	0%	
Selenium	A	mg/kg	0.00758	0		0	0	0	1.143	30	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685026	MB-118169	ICP-6010-S-T	MBLK		2/6/2018 3:48:49	1	118169	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	mg/kg	0.00191	0		0	0	0	1.824	30	450	0%	0	0	0%	
Silver	A	mg/kg	0.0005	0		0	0	0	0.3313	5	2	0%	0	0	0%	
Sodium	A	mg/kg	0.1515	7.575		0	0	0	1.843	30	450	0%	0	0	0%	
Strontium	A	mg/kg	0.00036	0.018		0	0	0	0.006754	1	18	0%	0	0	0%	
Tellurium	A	mg/kg	0.00945	0		0	0	0	0.5742	20	90	0%	0	0	0%	
Thallium	A	mg/kg	-0.00193	0		0	0	0	0.8951	20	225	0%	0	0	0%	
Tin	A	mg/kg	0.02154	1.077		0	0	0	0.561	10	225	0%	0	0	0%	
Titanium	A	mg/kg	0.00038	0		0	0	0	0.03712	2	225	0%	0	0	0%	
Uranium	A	mg/kg	-0.02847	0		0	0	0	2.342	50	900	0%	0	0	0%	
Vanadium	A	mg/kg	0.00087	0		0	0	0	0.2567	5	225	0%	0	0	0%	
Zinc	A	mg/kg	0.00258	0		0	0	0	0.3193	2	90	0%	0	0	0%	
Silica	C	mg/kg	0.0040874	0		0	0	0	3.90336	64.2	0	0%	0	0	0%	
Silicon as SiO2	C	mg/kg	0.0040874	0		0	0	0	3.90336	64.2	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685027	SRM-118169	ICP-6010-S-T	SRM		2/6/2018 3:52:43	1	118169	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	173.99	8633.3838		8780	0	0	0.5876000	9.924	900	98%	11	189	0%	
Antimony	A	mg/kg	0.31309	15.5355258		48	0	0	0.5127731	19.848	225	32%	0	238	0%	
Arsenic	A	mg/kg	2.357	116.95434		123	0	0	0.9606432	19.848	225	95%	87	112	0%	
Barium	A	mg/kg	4.5965	228.07833		253	0	0	0.0339401	1	18	90%	65	134	0%	
Beryllium	A	mg/kg	3.5932	178.294584		192	0	0	0.0083004	1	22.5	93%	82	118	0%	
Boron	A	mg/kg	2.5991	128.967342		139	0	0	0.2662609	4.962	450	93%	78	122	0%	
Cadmium	A	mg/kg	4.2055	208.67691		224	0	0	0.0235794	1	90	93%	87	112	0%	
Calcium	A	mg/kg	58.641	2909.76642		3090	0	0	3.979524	29.772	180	94%	85	115	0%	
Chromium	A	mg/kg	3.3104	164.262048		179	0	0	0.0949429	4.962	225	92%	86	114	0%	
Cobalt	A	mg/kg	1.1057	54.864834		60.1	0	0	0.0571424	3.9696	450	91%	84	116	0%	
Copper	A	mg/kg	1.4018	69.557316		78.9	0	0	0.0973445	4.962	225	88%	84	116	0%	
Gold	A	mg/kg	-0.03693	0		0	0	0	0.7922329	9.924	90	0%	0	0	0%	
Iron	A	mg/kg	77.711	3856.01982		4280	0	0	2.1455688	9.924	360	90%	72	128	0%	
Lead	A	mg/kg	2.7056	134.251872		145	0	0	0.8489982	19.848	900	93%	80	120	0%	
Lithium	A	mg/kg	1.8535	91.97067		94.8	0	0	0.0763255	4.962	22.5	97%	74	126	0%	
Magnesium	A	mg/kg	118.64	5886.9168		3470	0	0	2.4700836	7.9392	4500	170%	10	191	0%	
Manganese	A	mg/kg	7.3859	366.488358		335	0	0	0.0684657	1	45	109%	62	138	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685027	SRM-118169	ICP-6010-S-T	SRM		2/6/2018 3:52:43	1	118169	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	A	mg/kg	1.0479	51.996798		57.8	0	0	0.1579901	2.9772	225	90%	80	120	0%	
Nickel	A	mg/kg	2.5652	127.285224		143	0	0	0.1149199	2.9772	225	89%	84	112	0%	
Phosphorus	A	mg/kg	7.4255	368.45331		415	0	0	0.273307	19.848	360	89%	70	130	0%	
Potassium	A	mg/kg	56.535	2805.2667		3080	0	0	2.4879468	49.62	900	91%	80	120	0%	
Selenium	A	mg/kg	0.81595	40.487439		42.4	0	0	1.1343132	29.772	225	95%	79	121	0%	
Silicon	A	mg/kg	4.0547	201.194214		1110	0	0	1.8101376	29.772	450	18%	0	228	0%	
Silver	A	mg/kg	1.5149	75.169338		81.6	0	0	0.3287821	4.962	2	92%	83	117	0%	
Sodium	A	mg/kg	88.65	4398.813		4580	0	0	1.8289932	29.772	450	96%	85	115	0%	
Strontium	A	mg/kg	6.4404	319.572648		359	0	0	0.0067027	1	18	89%	65	135	0%	
Tellurium	A	mg/kg	0.02367	1.1745054		0	0	0	0.5698361	19.848	90	0%	0	0	0%	
Thallium	A	mg/kg	0.96018	47.6441316		52	0	0	0.8882972	19.848	225	92%	78	122	0%	
Tin	A	mg/kg	2.2195	110.13159		123	0	0	0.5567364	9.924	225	90%	78	122	0%	
Titanium	A	mg/kg	2.1956	108.945672		119	0	0	0.0368379	1.9848	225	92%	14	187	0%	
Uranium	A	mg/kg	0.02436	0		0	0	0	2.3242008	49.62	900	0%	0	0	0%	
Vanadium	A	mg/kg	1.3761	68.282082		72.3	0	0	0.2547491	4.962	225	94%	81	119	0%	
Zinc	A	mg/kg	14.05	697.161		770	0	0	0.3168733	1.9848	90	91%	83	117	0%	
Silica	C	mg/kg	8.677058	430.555618		0	0	0	3.8736945	63.71208	0	0%	0	0	0%	
Silicon as SiO2	C	mg/kg	8.677058	430.555618		0	0	0	3.8736945	63.71208	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685028	B18020067-001	6010.20-S	SAMP		2/6/2018 3:56:57	1	118169	2/5/2018 7:5	0	0	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	64.934	3152.64121		0	0	0	0.5749465	9.7102942	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	0.9177	44.5556848		0	0	0	0.0332092	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00547	0.26557655		0	0	0	0.0081217	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00049	0.02379022		0	0	0	0.0230717	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	19.659	954.473367		0	0	0	6.5767822	29.130883	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	93.279	4528.83265		0	0	0	2.0993656	9.7102942	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	16.309	791.825939		0	0	0	2.4168922	7.7682353	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	0.96526	46.8647928		0	0	0	0.0669913	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	1.4277	69.3169350		0	0	0	0.2674215	19.420588	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	10.035	487.214011		0	0	0	2.4343708	48.551471	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	1.117	54.231993		0	0	0	1.7896072	29.130883	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.24357	11.8256818		0	0	0	0.0065583	1	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685028	B18020067-001	6010.20-S	SAMP		2/6/2018 3:56:57	1	118169	2/5/2018 7:5	0	0	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/kg-dr	0.00385	0		0	0	0	0.5017309	19.420588	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.02115	1.02686361		0	0	0	0.9399565	19.420588	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0010575	0.05134318		0	0	0	0.0469978	0.9710294	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.01985	0.9637467		0	0	0	0.2605272	4.8551471	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.02698	1.30991868		0	0	0	0.0928984	4.8551471	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.001349	0.06549593		0	0	0	0.0046449	0.2427574	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.03212	1.55947325		0	0	0	0.0559119	3.8841177	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.02768	1.34390471		0	0	0	0.0952483	4.8551471	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.00714	0		0	0	0	0.7751728	9.7102942	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.07863	3.81760216		0	0	0	0.8307157	19.420588	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0039315	0.19088011		0	0	0	0.0415358	0.9710294	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.05178	2.51399516		0	0	0	0.0746819	4.8551471	22.5	0%	0	0	0%	DJ
Lithium as Li2O	B	mg/kg-dr	0.2231718	10.8353192		0	0	0	0.3218789	20.925684	10000	0%	0	0	0%	DJ
Molybdenum	B	mg/kg-dr	0.00298	0		0	0	0	0.1545879	2.9130883	225	0%	0	0	0%	D
Nickel	B	mg/kg-dr	0.05102	2.47709605		0	0	0	0.1124452	2.9130883	225	0%	0	0	0%	DJ
Selenium	B	mg/kg-dr	0.00857	0		0	0	0	1.1098866	29.130883	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.0004285	0		0	0	0	0.0554943	1.4565441	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	5.23226928	254.03437		0	0	0	3.7888605	62.316784	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	2.4459	118.752043		0	0	0	1.7711577	29.130883	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	5.23226928	254.03437		0	0	0	3.7888605	62.316784	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	0.00032	0		0	0	0	0.3217020	4.8551471	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	0.000016	0		0	0	0	0.0160851	0.2427574	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.0202	0.98073971		0	0	0	0.5575651	19.420588	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.00665	0		0	0	0	0.8691684	19.420588	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.01847	0.89674567		0	0	0	0.5447475	9.7102942	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.76329	37.0588522		0	0	0	0.0360446	1.9420588	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.2746943	61.8882832		0	0	0	0.0601945	3.2432383	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.06392	0		0	0	0	2.2741509	48.551471	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0432738	0		0	0	0	1.5396002	32.869346	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.13041	6.33159732		0	0	0	0.2492633	4.8551471	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.18577	9.01940675		0	0	0	0.3100497	1.9420588	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	122.72526	5958.49189		0	0	0	1.0866489	18.352456	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	1.027824	49.9023670		0	0	0	0.0371943	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		2.22764166		0	0	0	0.0016604	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0000245	0.00118951		0	0	0	0.0011536	0.05	0	0%	0	0	0%	J

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11685028	B18020067-001	6010.20-S	SAMP		2/6/2018 3:56:57	1	118169	2/5/2018 7:5	0	0	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium as CaCO3	C	mg/kg-dr		2385.22894		0	0	0	16.435379	72.798075	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	27.5226	1336.26271		0	0	0	9.2074951	40.783236	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	133.38897	6476.2307		0	0	0	3.0020928	13.885721	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		8950.15082		0	0	0	4.1488923	19.190066	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		2749.78977		0	0	0	8.39319	26.976906	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	27.07294	1314.43106		0	0	0	4.0120411	12.895271	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	1.2258802	59.5182869		0	0	0	0.085079	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	3.269433	158.735781		0	0	0	0.6123952	44.473147	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	12.042	584.656813		0	0	0	2.9212449	58.261765	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	1.50795	73.2131905		0	0	0	2.4159697	39.326691	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	0.2874126	13.9543045		0	0	0	0.0077388	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685029	B18020067-002	6010.20-S	SAMP		2/6/2018 4:00:39	1	118169	2/5/2018 7:5	0	0	9.64

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	37.584	1970.29003		0	0	0	0.6208007	10.484728	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	1.8887	99.0125259		0	0	0	0.0358578	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00364	0.19082204		0	0	0	0.0087694	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00021	0		0	0	0	0.0249117	1	90	0%	0	0	0%	
Calcium	A	mg/kg-dr	45.8	2401.00264		0	0	0	7.1013061	31.454183	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	108.4	5682.72241		0	0	0	2.2667981	10.484728	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	13.571	711.441197		0	0	0	2.6096487	8.3877821	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	1.2073	63.2910587		0	0	0	0.0723341	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	4.0195	210.716815		0	0	0	0.2887494	20.969455	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	6.4663	338.986973		0	0	0	2.6285212	52.423638	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	2.246	117.743492		0	0	0	1.9323353	31.454183	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.31119	16.3137120		0	0	0	0.0070814	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.00302	0		0	0	0	0.5417459	20.969455	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.02748	1.44060158		0	0	0	1.0149216	20.969455	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.001374	0.07203008		0	0	0	0.0507461	1.0484728	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.01892	0.99185524		0	0	0	0.2813052	5.2423638	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.00887	0.46499767		0	0	0	0.1003074	5.2423638	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.0004435	0.02324988		0	0	0	0.0050154	0.2621182	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.03347	1.75461918		0	0	0	0.0603711	4.1938911	450	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685029	B18020067-002	6010.20-S	SAMP		2/6/2018 4:00:39	1	118169	2/5/2018 7:5	0	0	9.64

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	B	mg/kg-dr	0.02829	1.48306473		0	0	0	0.1028447	5.2423638	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.0088	0		0	0	0	0.8369958	10.484728	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.07485	3.92390934		0	0	0	0.8969685	20.969455	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0037425	0.19619547		0	0	0	0.0448484	1.0484728	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.04994	2.61803650		0	0	0	0.0806380	5.2423638	22.5	0%	0	0	0%	DJ
Lithium as Li2O	B	mg/kg-dr	0.2152414	11.2837373		0	0	0	0.34755	22.594588	10000	0%	0	0	0%	DJ
Molybdenum	B	mg/kg-dr	0.0044	0.23066401		0	0	0	0.1669169	3.1454183	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.03655	1.91608398		0	0	0	0.1214131	3.1454183	225	0%	0	0	0%	DJ
Selenium	B	mg/kg-dr	0.0082	0		0	0	0	1.1984044	31.454183	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.00041	0		0	0	0	0.0599202	1.5727092	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	5.94825952	311.829406		0	0	0	4.0910367	67.286788	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	2.7806	145.769169		0	0	0	1.9124143	31.454183	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	5.94825952	311.829406		0	0	0	4.0910367	67.286788	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00016	0		0	0	0	0.3473590	5.2423638	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.000008	0		0	0	0	0.017368	0.2621182	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02403	1.25974003		0	0	0	0.6020331	20.969455	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.01725	0		0	0	0	0.938488	20.969455	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.0215	1.12710823		0	0	0	0.5881932	10.484728	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	1.3424	70.3734922		0	0	0	0.0389193	2.0969455	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	2.241808	117.523732		0	0	0	0.0649952	3.5018990	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.08471	0		0	0	0	2.4555232	52.423638	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0573487	0		0	0	0	1.6623892	35.490803	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.13247	6.94455938		0	0	0	0.269143	5.2423638	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.20064	10.5182788		0	0	0	0.3347774	2.0969455	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	71.03376	3723.84815		0	0	0	1.1733134	19.816135	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	2.115344	110.894029		0	0	0	0.0401607	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		4.95030945		0	0	0	0.0017928	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0000105	0		0	0	0	0.0012456	0.05	0	0%	0	0	0%	
Calcium as CaCO3	C	mg/kg-dr		6000.1056		0	0	0	17.746164	78.604003	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	64.12	3361.4037		0	0	0	9.9418285	44.035856	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	155.012	8126.29304		0	0	0	3.2415213	14.993161	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		11230.537		0	0	0	4.4797825	20.720548	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		2470.63607		0	0	0	9.0625793	29.128419	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	22.52786	1180.99239		0	0	0	4.3320169	13.923718	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	1.533271	80.3796445		0	0	0	0.0918644	1.27	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685029	B18020067-002	6010.20-S	SAMP		2/6/2018 4:00:39	1	118169	2/5/2018 7:5	0	0	9.64

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Phosphorus as P2O5	C	mg/kg-dr	9.204655	482.541506		0	0	0	0.6612361	48.020053	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	7.75956	406.784368		0	0	0	3.1542255	62.908366	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	3.0321	158.953714		0	0	0	2.6086527	42.463147	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	0.3672042	19.2501802		0	0	0	0.0083560	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685030	B18020068-001	6010.20-S	SAMP		2/6/2018 4:04:28	1	118169	2/5/2018 7:5	0	0	8.11

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	49.8	2699.4646		0	0	0	0.6419088	10.841223	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	1.0558	57.2308177		0	0	0	0.037077	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00408	0.22116095		0	0	0	0.0090676	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00122	0.06613146		0	0	0	0.0257587	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	168.53	9135.35679		0	0	0	7.3427605	32.52367	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	88.731	4809.76291		0	0	0	2.3438725	10.841223	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	31.043	1682.72047		0	0	0	2.6983805	8.6729786	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	1.1506	62.3695575		0	0	0	0.0747936	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	3.9198	212.477135		0	0	0	0.2985673	21.682447	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	9.2854	503.325473		0	0	0	2.7178947	54.206116	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	1.976	107.111286		0	0	0	1.9980374	32.52367	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.62489	33.8728601		0	0	0	0.0073222	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.00327	0		0	0	0	0.5601660	21.682447	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.03006	1.62943586		0	0	0	1.0494304	21.682447	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.001503	0.08147179		0	0	0	0.0524715	1.0841223	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.02558	1.38659246		0	0	0	0.2908700	5.4206116	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.02779	1.50638797		0	0	0	0.103718	5.4206116	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.0013895	0.0753194		0	0	0	0.0051859	0.2710306	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.02707	1.46735957		0	0	0	0.0624238	4.3364893	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.0393	2.13030037		0	0	0	0.1063416	5.4206116	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.00818	0		0	0	0	0.8654549	10.841223	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.07963	4.31643305		0	0	0	0.9274667	21.682447	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0039815	0.21582165		0	0	0	0.0463733	1.0841223	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.07234	3.92127046		0	0	0	0.0833798	5.4206116	22.5	0%	0	0	0%	DJ
Lithium as Li2O	B	mg/kg-dr	0.3117854	16.9006757		0	0	0	0.3593671	23.362836	10000	0%	0	0	0%	DJ
Molybdenum	B	mg/kg-dr	0.0058	0.31439547		0	0	0	0.1725923	3.252367	225	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685030	B18020068-001	6010.20-S	SAMP		2/6/2018 4:04:28	1	118169	2/5/2018 7:5	0	0	8.11

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	B	mg/kg-dr	0.04349	2.35742400		0	0	0	0.1255414	3.252367	225	0%	0	0	0%	DJ
Selenium	B	mg/kg-dr	0.00717	0		0	0	0	1.2391518	32.52367	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.0003585	0		0	0	0	0.0619576	1.6261835	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	6.2175848	337.031125		0	0	0	4.2301378	69.574634	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	2.9065	157.550077		0	0	0	1.9774391	32.52367	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	6.2175848	337.031125		0	0	0	4.2301378	69.574634	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00155	0		0	0	0	0.3591697	5.4206116	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.0000775	0		0	0	0	0.0179585	0.2710306	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02306	1.24999304		0	0	0	0.6225030	21.682447	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.00761	0		0	0	0	0.9703979	21.682447	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02258	1.22397411		0	0	0	0.6081926	10.841223	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.97782	53.0038247		0	0	0	0.0402426	2.1682447	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.6329594	88.5163873		0	0	0	0.0672052	3.6209686	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.05163	0		0	0	0	2.5390145	54.206116	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0349535	0		0	0	0	1.7189128	36.697541	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.12733	6.9020648		0	0	0	0.2782942	5.4206116	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.23074	12.5075193		0	0	0	0.3461603	2.1682447	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	94.122	5101.98808		0	0	0	1.2132077	20.489912	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	1.182496	64.0985158		0	0	0	0.0415262	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		2.86135774		0	0	0	0.0018537	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.000061	0.00330657		0	0	0	0.0012879	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		22829.2566		0	0	0	18.349559	81.276651	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	235.942	12789.4995		0	0	0	10.279865	45.533138	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	126.88533	6877.96096		0	0	0	3.3517376	15.502949	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		9505.34205		0	0	0	4.6321014	21.425076	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		5843.61703		0	0	0	9.3707198	30.118826	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	51.53138	2793.31598		0	0	0	4.4793116	14.397145	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	1.461262	79.2093380		0	0	0	0.0949879	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	8.976342	486.572639		0	0	0	0.6837191	49.652803	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	11.14248	603.990568		0	0	0	3.2614736	65.04734	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	2.6676	144.600236		0	0	0	2.6973506	43.906954	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	0.7373702	39.9699749		0	0	0	0.0086402	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685031	B18020068-002	6010.20-S	SAMP		2/6/2018 4:08:19	1	118169	2/5/2018 7:5	0	0	23.57

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	344.08	21649.6234		0	0	0	0.7451024	12.584064	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	3.361	211.475192		0	0	0	0.0430375	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.02002	1.25966479		0	0	0	0.0105253	1	22.5	0%	0	0	0%	
Cadmium	A	mg/kg-dr	0.00416	0.26174853		0	0	0	0.0298997	1.0067251	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	341.14	21464.6376		0	0	0	8.5231864	37.752191	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	303.65	19105.7549		0	0	0	2.7206746	12.584064	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	118.87	7479.33832		0	0	0	3.1321735	10.067251	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	8.184	514.939891		0	0	0	0.0868175	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	8.1426	512.334989		0	0	0	0.3465651	25.168128	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	46.402	2919.62864		0	0	0	3.1548248	62.920319	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	9.937	625.23921		0	0	0	2.319243	37.752191	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	2.4707	155.457232		0	0	0	0.0084993	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.01373	0.86389598		0	0	0	0.6502186	25.168128	225	0%	0	0	0%	DJ
Arsenic	B	mg/kg-dr	0.04975	3.13028587		0	0	0	1.2181374	25.168128	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0024875	0.15651429		0	0	0	0.0609069	1.2584064	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.08156	5.13178122		0	0	0	0.3376304	6.2920319	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.14464	9.10079494		0	0	0	0.1203917	6.2920319	225	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.007232	0.45503975		0	0	0	0.0060196	0.3146016	0	0%	0	0	0%	D
Cobalt	B	mg/kg-dr	0.14689	9.24236566		0	0	0	0.0724590	5.0336255	450	0%	0	0	0%	D
Copper	B	mg/kg-dr	0.21562	13.5668792		0	0	0	0.1234371	6.2920319	225	0%	0	0	0%	D
Gold	B	mg/kg-dr	-0.06695	0		0	0	0	1.0045858	12.584064	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.28229	17.7617768		0	0	0	1.0765667	25.168128	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0141145	0.88808884		0	0	0	0.0538283	1.2584064	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.31613	19.8910004		0	0	0	0.0967840	6.2920319	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	1.3625203	85.7302119		0	0	0	0.4171392	27.118657	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.00889	0.55936164		0	0	0	0.2003383	3.7752191	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.23571	14.8309484		0	0	0	0.1457235	3.7752191	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	0.00431	0		0	0	0	1.4383585	37.752191	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.0002155	0		0	0	0	0.0719179	1.8876096	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	11.8460339	745.356233		0	0	0	4.9101769	80.759488	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	5.5376	348.427558		0	0	0	2.2953332	37.752191	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	11.8460339	745.356233		0	0	0	4.9101769	80.759488	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00332	0		0	0	0	0.4169100	6.2920319	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.000166	0		0	0	0	0.0208455	0.3146016	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02973	1.87062108		0	0	0	0.7225769	25.168128	90	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685031	B18020068-002	6010.20-S	SAMP		2/6/2018 4:08:19	1	118169	2/5/2018 7:5	0	0	23.57

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	B	mg/kg-dr	-0.02722	0		0	0	0	1.1263996	25.168128	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.0272	1.71143268		0	0	0	0.705966	12.584064	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.65473	41.1958205		0	0	0	0.0467120	2.5168128	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.0933991	68.7970202		0	0	0	0.0780091	4.2030773	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	0.00145	0		0	0	0	2.9471877	62.920319	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	0.00098165	0		0	0	0	1.9952461	42.597056	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.42907	26.9972213		0	0	0	0.3230329	6.2920319	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.77391	48.6946641		0	0	0	0.4018092	2.5168128	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	650.3112	40917.7882		0	0	0	1.4082436	23.783881	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	3.76432	236.852215		0	0	0	0.048202	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		10.5730829		0	0	0	0.0021517	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.000208	0.01308743		0	0	0	0.001495	0.0503363	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		53640.1294		0	0	0	21.299443	94.342726	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	477.596	30050.4927		0	0	0	11.932461	52.853068	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	434.2195	27321.2295		0	0	0	3.8905647	17.995211	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		37757.9391		0	0	0	5.3767604	24.869382	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		25973.6478		0	0	0	10.877161	34.960744	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	197.3242	12415.7016		0	0	0	5.199408	16.711637	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	10.39368	653.973661		0	0	0	0.1102582	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	18.646554	1173.24713		0	0	0	0.7936341	57.635012	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	55.6824	3503.55437		0	0	0	3.7857898	75.504383	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	13.41495	844.072933		0	0	0	3.130978	50.965458	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	2.915426	183.439534		0	0	0	0.0100291	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685032	B18020068-003	6010.20-S	SAMP		2/6/2018 4:12:48	1	118169	2/5/2018 7:5	0	0	14.9

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	79.176	4527.26701		0	0	0	0.6771231	11.435958	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	1.6203	92.6484129		0	0	0	0.039111	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00634	0.36251987		0	0	0	0.0095650	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00128	0.07319013		0	0	0	0.0271718	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	254.62	14559.1180		0	0	0	7.7455743	34.307874	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	138.92	7943.41636		0	0	0	2.4724541	11.435958	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	47.268	2702.77429		0	0	0	2.8464099	9.1487663	4500	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685032	B18020068-003	6010.20-S	SAMP		2/6/2018 4:12:48	1	118169	2/5/2018 7:5	0	0	14.9

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	mg/kg-dr	3.4638	198.059355		0	0	0	0.0788967	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	3.7725	215.710756		0	0	0	0.3149463	22.871916	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	15.55	889.145727		0	0	0	2.8669946	57.17979	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	3.005	171.825267		0	0	0	2.1076470	34.307874	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.96625	55.2499716		0	0	0	0.0077238	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.00032	0		0	0	0	0.5908959	22.871916	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.05591	3.19692203		0	0	0	1.1070007	22.871916	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0027955	0.15984610		0	0	0	0.0553500	1.1435958	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.03539	2.02359275		0	0	0	0.3068268	5.717979	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.04019	2.29805574		0	0	0	0.1094078	5.717979	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.0020095	0.11490279		0	0	0	0.0054704	0.2858989	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.04763	2.72347337		0	0	0	0.0658482	4.5743832	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.0789	4.51148539		0	0	0	0.1121753	5.717979	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.02358	0		0	0	0	0.9129325	11.435958	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.13138	7.51228075		0	0	0	0.9783462	22.871916	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.006569	0.37561404		0	0	0	0.0489173	1.1435958	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.12426	7.10516064		0	0	0	0.087954	5.717979	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	0.5355606	30.6232424		0	0	0	0.3790815	24.644489	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.009	0.51461811		0	0	0	0.1820604	3.4307874	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.08004	4.57667035		0	0	0	0.1324284	3.4307874	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	0.00324	0		0	0	0	1.30713	34.307874	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.000162	0		0	0	0	0.0653565	1.7153937	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	5.78739168	330.921838		0	0	0	4.4621973	73.391403	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	2.7054	154.694203		0	0	0	2.0859187	34.307874	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	5.78739168	330.921838		0	0	0	4.4621973	73.391403	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00135	0		0	0	0	0.3788733	5.717979	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.0000675	0		0	0	0	0.0189437	0.2858989	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02204	1.26024256		0	0	0	0.6566527	22.871916	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.01725	0		0	0	0	1.0236326	22.871916	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.01992	1.13902141		0	0	0	0.6415572	11.435958	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.81393	46.5403461		0	0	0	0.0424503	2.2871916	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.3592631	77.7223779		0	0	0	0.070892	3.8196099	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.05809	0		0	0	0	2.6783013	57.17979	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0393269	0		0	0	0	1.8132100	38.710717	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.17316	9.90125235		0	0	0	0.2935610	5.717979	225	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685032	B18020068-003	6010.20-S	SAMP		2/6/2018 4:12:48	1	118169	2/5/2018 7:5	0	0	14.9

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	B	mg/kg-dr	0.36811	21.0484523		0	0	0	0.3651501	2.2871916	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	149.64264	8556.53466		0	0	0	1.2797626	21.613960	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	1.814736	103.766222		0	0	0	0.0438043	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		4.63212417		0	0	0	0.0019554	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.000064	0.00365951		0	0	0	0.0013586	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		36383.2359		0	0	0	19.356190	85.735376	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	356.468	20382.7652		0	0	0	10.843804	48.031023	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	198.6556	11359.0854		0	0	0	3.5356094	16.35342	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		15698.2560		0	0	0	4.8862121	22.600426	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		9385.97833		0	0	0	9.8847847	31.771104	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	78.46488	4486.60532		0	0	0	4.7250405	15.186952	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	4.399026	251.535381		0	0	0	0.1001988	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	8.639025	493.977631		0	0	0	0.721227	52.376687	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	18.66	1066.97487		0	0	0	3.4403936	68.615747	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	4.05675	231.964111		0	0	0	2.8453235	46.31563	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	1.140175	65.1949665		0	0	0	0.0091141	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685033	B18020068-004	6010.20-S	SAMP		2/6/2018 4:16:49	1	118169	2/5/2018 7:5	0	0	10.1

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	264.32	14468.5061		0	0	0	0.6482145	10.94772	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	3.2145	175.957222		0	0	0	0.0374412	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.01777	0.97270488		0	0	0	0.0091567	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00375	0.20526974		0	0	0	0.0260118	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	361.16	19769.3919		0	0	0	7.4148904	32.843159	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	303.56	16616.4487		0	0	0	2.366897	10.94772	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	99.972	5472.32707		0	0	0	2.7248874	8.7581756	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	5.7832	316.564257		0	0	0	0.0755283	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	7.0304	384.834236		0	0	0	0.3015002	21.895439	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	42.66	2335.14857		0	0	0	2.7445933	54.738598	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	7.477	409.280494		0	0	0	2.0176647	32.843159	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	1.6887	92.4370696		0	0	0	0.0073941	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.01133	0.62018831		0	0	0	0.5656687	21.895439	225	0%	0	0	0%	DJ
Arsenic	B	mg/kg-dr	0.1226	6.71095206		0	0	0	1.0597392	21.895439	225	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685033	B18020068-004	6010.20-S	SAMP		2/6/2018 4:16:49	1	118169	2/5/2018 7:5	0	0	10.1

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.00613	0.33554760		0	0	0	0.052987	1.094772	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.04114	2.25194590		0	0	0	0.2937273	5.4738598	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.12242	6.70109911		0	0	0	0.1047368	5.4738598	225	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.006121	0.33505496		0	0	0	0.0052368	0.273693	0	0%	0	0	0%	D
Cobalt	B	mg/kg-dr	0.12181	6.66770856		0	0	0	0.063037	4.3790878	450	0%	0	0	0%	D
Copper	B	mg/kg-dr	0.25182	13.7842736		0	0	0	0.1073862	5.4738598	225	0%	0	0	0%	D
Gold	B	mg/kg-dr	-0.05706	0		0	0	0	0.8739564	10.94772	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.27851	15.2452468		0	0	0	0.9365774	21.895439	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0139255	0.76226234		0	0	0	0.0468289	1.094772	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.28077	15.3689560		0	0	0	0.0841989	5.4738598	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	1.2101187	66.2402005		0	0	0	0.3628973	23.592336	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.01079	0.59062947		0	0	0	0.1742877	3.2843159	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.2029	11.1064614		0	0	0	0.1267746	3.2843159	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	-0.00141	0		0	0	0	1.2513243	32.843159	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	-0.0000705	0		0	0	0	0.0625662	1.6421579	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	9.57655664	524.207279		0	0	0	4.2716915	70.258085	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	4.4767	245.048279		0	0	0	1.9968640	32.843159	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	9.57655664	524.207279		0	0	0	4.2716915	70.258085	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00274	0		0	0	0	0.3626979	5.4738598	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.000137	0		0	0	0	0.0181349	0.273693	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.03139	1.71824458		0	0	0	0.6286181	21.895439	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.02538	0		0	0	0	0.9799304	21.895439	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02809	1.53760720		0	0	0	0.6141671	10.94772	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.87149	47.7041403		0	0	0	0.0406379	2.1895439	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.4553883	79.6659144		0	0	0	0.0678654	3.6565383	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.02397	0		0	0	0	2.5639559	54.738598	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0162277	0		0	0	0	1.7357981	37.058031	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.39133	21.4208554		0	0	0	0.281028	5.4738598	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.95113	52.0635223		0	0	0	0.3495607	2.1895439	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	499.5648	27345.4765		0	0	0	1.2251254	20.69119	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	3.60024	197.072088		0	0	0	0.0419341	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		8.79729802		0	0	0	0.0018719	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0001875	0.01026349		0	0	0	0.0013006	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		49403.7103		0	0	0	18.529811	82.075053	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	505.624	27677.1486		0	0	0	10.380847	45.980422	100000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685033	B18020068-004	6010.20-S	SAMP		2/6/2018 4:16:49	1	118169	2/5/2018 7:5	0	0	10.1

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron as Fe2O3	C	mg/kg-dr	434.0908	23761.5216		0	0	0	3.3846626	15.655239	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		32838.4228		0	0	0	4.6776038	21.635540	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		19003.8597		0	0	0	9.4627709	30.414692	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	165.95352	9084.06294		0	0	0	4.5233131	14.538571	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	7.344664	402.036607		0	0	0	0.095921	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	16.099616	881.270400		0	0	0	0.6904354	50.140555	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	51.192	2802.17828		0	0	0	3.2935119	65.686317	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	10.09395	552.528666		0	0	0	2.7238474	44.338264	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	1.992666	109.075742		0	0	0	0.0087250	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685034	B18020068-005	6010.20-S	SAMP		2/6/2018 4:21:17	1	118169	2/5/2018 7:5	0	0	1.42

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	54.462	2746.30348		0	0	0	0.5971453	10.08521	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	2.865	144.470630		0	0	0	0.0344914	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00594	0.29953073		0	0	0	0.0084353	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00098	0.04941753		0	0	0	0.0239625	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	206.31	10403.3982		0	0	0	6.8307126	30.255629	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	185.25	9341.42557		0	0	0	2.1804224	10.08521	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	27.385	1380.91735		0	0	0	2.5102087	8.0681678	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	4.9786	251.051127		0	0	0	0.0695779	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	5.5236	278.533324		0	0	0	0.2777467	20.17042	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	10.842	546.719223		0	0	0	2.5283621	50.426049	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	1.514	76.3450381		0	0	0	1.8587042	30.255629	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.59138	29.8209568		0	0	0	0.0068116	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.00254	0		0	0	0	0.5211028	20.17042	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.07659	3.86213109		0	0	0	0.9762483	20.17042	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0038295	0.19310655		0	0	0	0.0488124	1.008521	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.01785	0.90010497		0	0	0	0.2705862	5.0426049	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.01416	0.71403285		0	0	0	0.0964852	5.0426049	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.000708	0.03570164		0	0	0	0.0048243	0.2521302	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.04658	2.34884536		0	0	0	0.0580706	4.0340839	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.05196	2.62013750		0	0	0	0.0989258	5.0426049	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.04072	0		0	0	0	0.8051023	10.08521	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685034	B18020068-005	6010.20-S	SAMP		2/6/2018 4:21:17	1	118169	2/5/2018 7:5	0	0	1.42

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	B	mg/kg-dr	0.11131	5.61292351		0	0	0	0.8627897	20.17042	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0055655	0.28064618		0	0	0	0.0431395	1.008521	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.07138	3.59941138		0	0	0	0.0775653	5.0426049	22.5	0%	0	0	0%	DJ
Lithium as Li2O	B	mg/kg-dr	0.3076478	15.5134630		0	0	0	0.3343067	21.733627	10000	0%	0	0	0%	DJ
Molybdenum	B	mg/kg-dr	0.01146	0.57788252		0	0	0	0.1605565	3.0255629	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.05944	2.99732435		0	0	0	0.1167867	3.0255629	225	0%	0	0	0%	DJ
Selenium	B	mg/kg-dr	0.00616	0		0	0	0	1.1527395	30.255629	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.000308	0		0	0	0	0.057637	1.5127815	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	6.59108912	332.362583		0	0	0	3.9351488	64.722842	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	3.0811	155.367699		0	0	0	1.8395423	30.255629	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	6.59108912	332.362583		0	0	0	3.9351488	64.722842	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00072	0		0	0	0	0.3341230	5.0426049	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.000036	0		0	0	0	0.0167062	0.2521302	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02961	1.49311531		0	0	0	0.5790927	20.17042	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.01507	0		0	0	0	0.9027271	20.17042	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02476	1.24854897		0	0	0	0.5657803	10.08521	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	1.4271	71.9630145		0	0	0	0.0374363	2.017042	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	2.383257	120.178234		0	0	0	0.0625186	3.3684601	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.07464	0		0	0	0	2.3619561	50.426049	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0505313	0		0	0	0	1.5990443	34.138435	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.22319	11.2545899		0	0	0	0.2588873	5.0426049	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.33587	16.9365971		0	0	0	0.3220207	2.017042	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	102.93318	5190.51358		0	0	0	1.1286046	19.061047	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	3.2088	161.807106		0	0	0	0.0386304	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		7.22306921		0	0	0	0.0017245	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.000049	0.00247088		0	0	0	0.0011981	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		25998.0920		0	0	0	17.069951	75.608818	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	288.834	14564.7574		0	0	0	9.5629976	42.357881	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	264.9075	13358.2386		0	0	0	3.118004	14.421850	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		18461.0857		0	0	0	4.3090815	19.930997	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		4795.53930		0	0	0	8.7172520	28.018488	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	45.4591	2292.32280		0	0	0	4.1669465	13.393159	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	6.322822	318.834932		0	0	0	0.0883639	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	12.649044	637.841312		0	0	0	0.6360399	46.190261	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	13.0104	656.063068		0	0	0	3.0340345	60.511259	100000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685034	B18020068-005	6010.20-S	SAMP		2/6/2018 4:21:17	1	118169	2/5/2018 7:5	0	0	1.42

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Sodium as Na2O	C	mg/kg-dr	2.0439	103.065801		0	0	0	2.5092506	40.8451	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	0.6978284	35.1887291		0	0	0	0.0080376	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685035	CCV	ICP-6010-W-D	CCV		2/6/2018 4:25:23	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5691	2.5691		2.5	0	0	0.0066084	0.1	18	103%	90	110	0%	
Antimony	A	mg/L	2.5744	2.5744		2.5	0	0	0.0356182	0.05	225	103%	90	110	0%	
Arsenic	A	mg/L	2.5963	2.5963		2.5	0	0	0.0231651	0.1	225	104%	90	110	0%	
Barium	A	mg/L	2.5645	2.5645		2.5	0	0	0.0003929	0.1	18	103%	90	110	0%	
Beryllium	A	mg/L	1.289	1.289		1.25	0	0	0.0002318	0.01	22.5	103%	90	110	0%	
Boron	A	mg/L	2.5667	2.5667		2.5	0	0	0.0080048	0.1	450	103%	90	110	0%	
Cadmium	A	mg/L	2.5148	2.5148		2.5	0	0	0.0010328	0.01	90	101%	90	110	0%	
Calcium	A	mg/L	26.356	26.356		25	0	0	0.1071422	1	180	105%	90	110	0%	
Chromium	A	mg/L	2.5347	2.5347		2.5	0	0	0.0010626	0.05	225	101%	90	110	0%	
Cobalt	A	mg/L	2.5017	2.5017		2.5	0	0	0.0033639	0.02	450	100%	90	110	0%	
Copper	A	mg/L	2.5004	2.5004		2.5	0	0	0.0048764	0.01	225	100%	90	110	0%	
Gold	A	mg/L	2.4936	2.4936		2.5	0	0	0.0189485	0.1	90	100%	90	110	0%	
Iron	A	mg/L	2.6939	2.6939		2.5	0	0	0.0250321	0.0250321	360	108%	90	110	0%	
Lead	A	mg/L	2.5098	2.5098		2.5	0	0	0.0187623	0.05	900	100%	90	110	0%	
Lithium	A	mg/L	1.2925	1.2925		1.25	0	0	0.0059040	0.1	22.5	103%	90	110	0%	
Magnesium	A	mg/L	26.083	26.083		25	0	0	0.0116555	1	180	104%	90	110	0%	
Manganese	A	mg/L	2.5231	2.5231		2.5	0	0	0.0010649	0.01	45	101%	90	110	0%	
Mercury	A	mg/L	1.0225	1.0225		1	0	0	0.0100947	0.02	45	102%	90	110	0%	
Molybdenum	A	mg/L	2.5576	2.5576		2.5	0	0	0.0031266	0.1	225	102%	90	110	0%	
Nickel	A	mg/L	2.4874	2.4874		2.5	0	0	0.0012530	0.05	225	99%	90	110	0%	
Phosphorus	A	mg/L	2.5812	2.5812		2.5	0	0	0.0425464	0.1	360	103%	90	110	0%	
Potassium	A	mg/L	25.882	25.882		25	0	0	0.0854754	1	900	104%	90	110	0%	
Selenium	A	mg/L	2.5321	2.5321		2.5	0	0	0.0234201	0.1	225	101%	90	110	0%	
Silicon	A	mg/L	5.2072	5.2072		5	0	0	0.0487685	0.1	450	104%	90	110	0%	
Silver	A	mg/L	1.011	1.011		1	0	0	0.0055813	0.01	2	101%	90	110	0%	
Sodium	A	mg/L	25.95	25.95		25	0	0	0.1131395	1	450	104%	90	110	0%	
Strontium	A	mg/L	2.5114	2.5114		2.5	0	0	0.0002417	0.1	18	100%	90	110	0%	
Tellurium	A	mg/L	2.5168	2.5168		2.5	0	0	0.0301968	0.1	90	101%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685035	CCV	ICP-6010-W-D	CCV		2/6/2018 4:25:23	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	2.4908	2.4908		2.5	0	0	0.0116401	0.5	225	100%	90	110	0%	
Tin	A	mg/L	2.531	2.531		2.5	0	0	0.0081865	0.1	225	101%	90	110	0%	
Titanium	A	mg/L	2.5578	2.5578		2.5	0	0	0.002716	0.01	225	102%	90	110	0%	
Uranium	A	mg/L	2.5416	2.5416		2.5	0	0	0.1154022	0.1154022	900	102%	90	110	0%	
Vanadium	A	mg/L	2.587	2.587		2.5	0	0	0.0036660	0.1	225	103%	90	110	0%	
Zinc	A	mg/L	2.5282	2.5282		2.5	0	0	0.0023364	0.01	90	101%	90	110	0%	
Silica	C	mg/L	11.1392422	11.1392422		10.7	0	0	0.1043257	0.21392	100	104%	90	110	0%	
Silicon as SiO2	C	mg/L	11.143408	11.143408		10.7	0	0	0.1043647	0.214	0	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685036	CCB	ICP-6010-W-D	CCB		2/6/2018 4:29:06	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00102	0.00102		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.00593	-0.00593		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.0031	0.0031		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00045	0.00045		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00015	0.00015		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00348	0.00348		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00052	0.00052		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00581	0.00581		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00043	0.00043		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00073	0.00073		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	-0.00006	-0.00006		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00379	0.00379		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	-0.00034	-0.00034		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00277	-0.00277		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	-0.00059	-0.00059		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00473	0.00473		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00042	0.00042		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	-0.00139	-0.00139		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00029	0.00029		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0.00057	0.00057		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.00228	0.00228		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.00734	0.00734		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685036	CCB	ICP-6010-W-D	CCB		2/6/2018 4:29:06	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	0.01527	0.01527		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.00119	0.00119		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00163	-0.00163		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0695	0.0695		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00043	0.00043		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01523	0.01523		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00122	0.00122		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	-0.00258	-0.00258		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00064	0.00064		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.03232	-0.03232		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.0007	0.0007		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00063	0.00063		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.00254565	0.00254565		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0025466	0.0025466		0	0	0	0.1043647	0.214	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685539	B18020068-006	6010.20-S	SAMP		2/6/2018 4:34:47	1	118169	2/5/2018 7:5	0	0	6.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	168.56	8924.92559		0	0	0	0.627011	10.589613	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	2.5208	133.471479		0	0	0	0.0362165	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00945	0.50035920		0	0	0	0.0088572	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00208	0.11013197		0	0	0	0.0251609	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	393.92	20857.3012		0	0	0	7.1723447	31.768838	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	187.58	9931.99776		0	0	0	2.2894743	10.589613	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	60.03	3178.47225		0	0	0	2.6357546	8.4716902	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	3.6104	191.163689		0	0	0	0.0730577	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	4.4754	236.963763		0	0	0	0.2916379	21.179225	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	27.707	1467.032		0	0	0	2.6548159	52.948064	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	2.692	142.536187		0	0	0	1.9516656	31.768838	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	1.6389	86.7765813		0	0	0	0.0071522	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.00553	0		0	0	0	0.5471653	21.179225	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.04722	2.50020756		0	0	0	1.0250745	21.179225	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.002361	0.12501038		0	0	0	0.0512537	1.0589613	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.05878	3.11228717		0	0	0	0.2841193	5.2948064	450	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685539	B18020068-006	6010.20-S	SAMP		2/6/2018 4:34:47	1	118169	2/5/2018 7:5	0	0	6.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	B	mg/kg-dr	0.09809	5.19367555		0	0	0	0.1013108	5.2948064	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.0049045	0.25968378		0	0	0	0.0050655	0.2647403	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.06459	3.41991542		0	0	0	0.060975	4.2358451	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.09958	5.27256817		0	0	0	0.1038735	5.2948064	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.03639	0		0	0	0	0.8453688	10.589613	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.16268	8.61359097		0	0	0	0.9059414	21.179225	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.008134	0.43067955		0	0	0	0.0452971	1.0589613	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.18679	9.89016879		0	0	0	0.0814447	5.2948064	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	0.8050649	42.6266275		0	0	0	0.3510267	22.820615	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.00962	0.50936037		0	0	0	0.1685866	3.1768838	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.11939	6.32146930		0	0	0	0.1226277	3.1768838	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	-0.00065	0		0	0	0	1.2103927	31.768838	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	-0.0000325	0		0	0	0	0.0605196	1.5884419	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	9.749404	516.212062		0	0	0	4.1319618	67.959898	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	4.5575	241.310799		0	0	0	1.9315454	31.768838	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	9.749404	516.212062		0	0	0	4.1319618	67.959898	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00178	0		0	0	0	0.3508339	5.2948064	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.000089	0		0	0	0	0.0175417	0.2647403	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02886	1.52808111		0	0	0	0.6080556	21.179225	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.01043	0		0	0	0	0.9478762	21.179225	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02225	1.17809441		0	0	0	0.5940773	10.589613	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.79467	42.0762376		0	0	0	0.0393086	2.1179225	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.3270989	70.2673169		0	0	0	0.0656454	3.5369306	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.09772	0		0	0	0	2.4800873	52.948064	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0661564	0		0	0	0	1.6790191	35.845839	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.23281	12.3268387		0	0	0	0.2718354	5.2948064	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.44872	23.7588551		0	0	0	0.3381263	2.1179225	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	318.5784	16868.1094		0	0	0	1.1850507	20.014368	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	2.823296	149.488056		0	0	0	0.0405625	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		6.67314682		0	0	0	0.0018107	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.000104	0.0055066		0	0	0	0.0012580	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		52122.3957		0	0	0	17.923689	79.390326	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	551.488	29200.2217		0	0	0	10.041283	44.476373	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	268.2394	14202.7568		0	0	0	3.2739482	15.143146	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		19628.2099		0	0	0	4.5245964	20.927828	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685539	B18020068-006	6010.20-S	SAMP		2/6/2018 4:34:47	1	118169	2/5/2018 7:5	0	0	6.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium as MgCO3	C	mg/kg-dr		11037.9442		0	0	0	9.1532377	29.419808	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	99.6498	5276.26394		0	0	0	4.3753526	14.063006	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	4.585208	242.777884		0	0	0	0.0927833	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	10.248666	542.647018		0	0	0	0.6678509	48.500426	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	33.2484	1760.4384		0	0	0	3.1857791	63.537676	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	3.6342	192.423852		0	0	0	2.6347486	42.887931	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	1.933902	102.396366		0	0	0	0.0084396	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685540	B18020068-007	6010.20-S	SAMP		2/6/2018 4:39:18	1	118169	2/5/2018 7:5	0	0	14.4

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	127.54	6871.66461		0	0	0	0.6380293	10.775701	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	2.1025	113.279558		0	0	0	0.0368529	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00624	0.33620188		0	0	0	0.0090128	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00132	0.07111963		0	0	0	0.0256031	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	298.02	16056.8722		0	0	0	7.2983824	32.327103	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	123.72	6665.84872		0	0	0	2.3297066	10.775701	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	61.113	3292.67711		0	0	0	2.6820720	8.6205609	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	4.6489	250.475785		0	0	0	0.0743416	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	3.9264	211.548565		0	0	0	0.2967628	21.551402	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	15.425	831.075949		0	0	0	2.7014683	53.878506	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	4.103	221.063509		0	0	0	1.9859617	32.327103	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	1.5913	85.7368660		0	0	0	0.0072779	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.00058	0		0	0	0	0.5567805	21.551402	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.0478	2.57539257		0	0	0	1.0430879	21.551402	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.00239	0.12876963		0	0	0	0.0521544	1.0775701	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.04905	2.64274070		0	0	0	0.2891121	5.3878506	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.06193	3.33669585		0	0	0	0.1030911	5.3878506	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.0030965	0.16683479		0	0	0	0.0051546	0.2693925	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.04179	2.25158275		0	0	0	0.0620465	4.3102805	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.06111	3.29251548		0	0	0	0.1056989	5.3878506	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.03505	0		0	0	0	0.8602242	10.775701	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.1118	6.02361693		0	0	0	0.9218612	21.551402	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.00559	0.30118085		0	0	0	0.0460931	1.0775701	0	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685540	B18020068-007	6010.20-S	SAMP		2/6/2018 4:39:18	1	118169	2/5/2018 7:5	0	0	14.4

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lithium	B	mg/kg-dr	0.16602	8.94490951		0	0	0	0.0828759	5.3878506	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	0.7155462	38.55256		0	0	0	0.3571952	23.221636	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.00588	0.31680561		0	0	0	0.1715492	3.2327103	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.07664	4.12924867		0	0	0	0.1247826	3.2327103	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	-0.00061	0		0	0	0	1.2316626	32.327103	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	-0.0000305	0		0	0	0	0.0615831	1.6163552	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	7.7257208	416.250292		0	0	0	4.2045717	69.15414	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	3.6115	194.582223		0	0	0	1.9654879	32.327103	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	7.7257208	416.250292		0	0	0	4.2045717	69.15414	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00075	0		0	0	0	0.356999	5.3878506	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.0000375	0		0	0	0	0.0178499	0.2693925	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02001	1.0781089		0	0	0	0.6187408	21.551402	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.00875	0		0	0	0	0.9645330	21.551402	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02242	1.2079561		0	0	0	0.6045168	10.775701	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.68572	36.9455689		0	0	0	0.0399994	2.1551402	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.1451524	61.6991000		0	0	0	0.0667990	3.5990842	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.07666	0		0	0	0	2.5236692	53.878506	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0518988	0		0	0	0	1.7085241	36.475748	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.20008	10.7800114		0	0	0	0.2766122	5.3878506	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.271	14.6010750		0	0	0	0.3440681	2.1551402	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	241.0506	12987.4461		0	0	0	1.2058753	20.366075	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	2.3548	126.873105		0	0	0	0.0412752	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		5.66361541		0	0	0	0.0018425	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.000066	0.00355598		0	0	0	0.0012802	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		40126.1237		0	0	0	18.238658	80.785431	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	417.228	22479.6211		0	0	0	10.217735	45.257945	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	176.9196	9532.16367		0	0	0	3.3314804	15.409253	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		13173.4502		0	0	0	4.6041059	21.295587	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		11434.5457		0	0	0	9.3140851	29.936794	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	101.44758	5465.84401		0	0	0	4.4522395	14.310131	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	5.904103	318.104247		0	0	0	0.0944138	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	8.991456	484.446213		0	0	0	0.6795868	49.352711	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	18.51	997.291139		0	0	0	3.2417619	64.654207	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	5.53905	298.435737		0	0	0	2.6810483	43.64159	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	1.877734	101.169502		0	0	0	0.0085879	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685541	B18020068-008	6010.20-S	SAMP		2/6/2018 4:43:32	1	118169	2/5/2018 7:5	0	0	0.84

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	34.927	1549.10186		0	0	0	0.5252230	8.870512	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	0.4304	19.0893418		0	0	0	0.0303372	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00245	0.10866377		0	0	0	0.0074193	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00095	0.04213493		0	0	0	0.0210763	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	12.763	566.071722		0	0	0	6.0079978	26.611536	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	61.768	2739.56892		0	0	0	1.9178047	8.870512	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	8.6041	381.613860		0	0	0	2.2078704	7.0964096	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	0.79449	35.2376653		0	0	0	0.0611977	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	1.2178	54.0125474		0	0	0	0.2442939	17.741024	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	8.2435	365.620327		0	0	0	2.2238374	44.35256	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	1.403	62.2266415		0	0	0	1.6348354	26.611536	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.11267	4.99720292		0	0	0	0.0059911	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.00571	0		0	0	0	0.4583394	17.741024	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.01725	0		0	0	0	0.8586656	17.741024	225	0%	0	0	0%	D
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0008625	0		0	0	0	0.0429333	0.8870512	0	0%	0	0	0%	D
Boron	B	mg/kg-dr	0.0158	0.70077045		0	0	0	0.2379958	4.435256	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.03584	1.58959575		0	0	0	0.0848642	4.435256	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.001792	0.07947979		0	0	0	0.0042432	0.2217628	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.01919	0.85112562		0	0	0	0.0510764	3.5482048	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.02849	1.26360443		0	0	0	0.0870109	4.435256	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.00677	0		0	0	0	0.708133	8.870512	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.05541	2.45757534		0	0	0	0.7588723	17.741024	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0027705	0.12287877		0	0	0	0.0379436	0.8870512	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.02919	1.29465122		0	0	0	0.0682231	4.435256	22.5	0%	0	0	0%	DJ
Lithium as Li2O	B	mg/kg-dr	0.1258089	5.57994677		0	0	0	0.2940416	19.115953	10000	0%	0	0	0%	DJ
Molybdenum	B	mg/kg-dr	0.00477	0.21156171		0	0	0	0.1412186	2.6611536	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.03226	1.43081358		0	0	0	0.1027205	2.6611536	225	0%	0	0	0%	DJ
Selenium	B	mg/kg-dr	0.00677	0		0	0	0	1.0138995	26.611536	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.0003385	0		0	0	0	0.050695	1.3305768	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	6.44883232	286.022222		0	0	0	3.4611858	56.927398	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	3.0146	133.705227		0	0	0	1.6179814	26.611536	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	6.44883232	286.022222		0	0	0	3.4611858	56.927398	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00121	0		0	0	0	0.2938801	4.435256	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.0000605	0		0	0	0	0.0146940	0.2217628	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02284	1.01301247		0	0	0	0.5093448	17.741024	90	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685541	B18020068-008	6010.20-S	SAMP		2/6/2018 4:43:32	1	118169	2/5/2018 7:5	0	0	0.84

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	B	mg/kg-dr	-0.00595	0		0	0	0	0.7939995	17.741024	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.0224	0.99349734		0	0	0	0.4976357	8.870512	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.82912	36.7735944		0	0	0	0.0329273	1.7741024	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.3846304	61.4119027		0	0	0	0.0549887	2.962751	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.0391	0		0	0	0	2.0774739	44.35256	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0264707	0		0	0	0	1.4064498	30.026683	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.1115	4.94531043		0	0	0	0.2277060	4.435256	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.12136	5.38262667		0	0	0	0.2832354	1.7741024	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	66.01203	2927.80251		0	0	0	0.9926715	16.765268	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	0.482048	21.3800628		0	0	0	0.0339776	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		0.95440600		0	0	0	0.0015168	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0000475	0.00210675		0	0	0	0.0010538	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		1414.61323		0	0	0	15.013986	66.502228	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	17.8682	792.500410		0	0	0	8.4111969	37.256150	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	88.32824	3917.58355		0	0	0	2.7424607	12.684832	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		5414.10047		0	0	0	3.7900807	17.530438	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		1325.23809		0	0	0	7.6673158	24.643843	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	14.282806	633.479008		0	0	0	3.6650649	11.78004	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	1.0090023	44.7518349		0	0	0	0.0777210	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	2.788762	123.688734		0	0	0	0.5594330	40.626945	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	9.8922	438.744393		0	0	0	2.6686048	53.223072	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	1.89405	84.0059660		0	0	0	2.2070277	35.925574	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	0.1329506	5.89669945		0	0	0	0.0070695	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685542	B18020068-009	6010.20-S	SAMP		2/6/2018 4:47:15	1	118169	2/5/2018 7:5	0	0	3.91

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	57.118	2959.62673		0	0	0	0.6136052	10.363202	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	1.3699	70.9827491		0	0	0	0.0354421	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00342	0.17721075		0	0	0	0.0086678	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.0006	0.03108960		0	0	0	0.024623	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	117.9	6109.10732		0	0	0	7.0189964	31.089605	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	148.64	7701.9314		0	0	0	2.2405242	10.363202	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	14.716	762.524371		0	0	0	2.5794009	8.2905612	4500	0%	0	0	0%	D

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Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	mg/kg-dr	2.3795	123.296191		0	0	0	0.0714957	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	2.0941	108.507902		0	0	0	0.2854026	20.726403	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	14.365	744.336952		0	0	0	2.5980546	51.816008	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	3.833	198.610758		0	0	0	1.9099380	31.089605	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.40656	21.0663161		0	0	0	0.0069993	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.00418	0		0	0	0	0.5354666	20.726403	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.03396	1.75967162		0	0	0	1.0031579	20.726403	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.001698	0.08798358		0	0	0	0.0501579	1.0363202	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.02759	1.42960366		0	0	0	0.2780447	5.1816008	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.13214	6.84696727		0	0	0	0.0991447	5.1816008	225	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.006607	0.34234836		0	0	0	0.0049572	0.2590800	0	0%	0	0	0%	D
Cobalt	B	mg/kg-dr	0.0351	1.81874187		0	0	0	0.0596713	4.1452806	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.05318	2.75557529		0	0	0	0.1016526	5.1816008	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.02564	0		0	0	0	0.8272944	10.363202	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.06929	3.59033118		0	0	0	0.8865719	20.726403	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0034645	0.17951656		0	0	0	0.0443286	1.0363202	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.04891	2.53432094		0	0	0	0.0797034	5.1816008	22.5	0%	0	0	0%	DJ
Lithium as Li2O	B	mg/kg-dr	0.2108021	10.9229233		0	0	0	0.3435216	22.332699	10000	0%	0	0	0%	DJ
Molybdenum	B	mg/kg-dr	0.02369	1.22752122		0	0	0	0.1649822	3.1089605	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.05748	2.97838413		0	0	0	0.1200059	3.1089605	225	0%	0	0	0%	DJ
Selenium	B	mg/kg-dr	0.00707	0		0	0	0	1.1845139	31.089605	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.0003535	0		0	0	0	0.0592257	1.5544802	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	12.6944406	657.775235		0	0	0	4.0436184	66.506882	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	5.9342	307.486554		0	0	0	1.890248	31.089605	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	12.6944406	657.775235		0	0	0	4.0436184	66.506882	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00111	0		0	0	0	0.3433329	5.1816008	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.0000555	0		0	0	0	0.0171666	0.2590800	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.01831	0.94875110		0	0	0	0.5950550	20.726403	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.01372	0		0	0	0	0.9276102	20.726403	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02188	1.13373425		0	0	0	0.5813756	10.363202	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	1.2329	63.8839560		0	0	0	0.0384682	2.0726403	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	2.058943	106.686207		0	0	0	0.0642419	3.4613093	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.06263	0		0	0	0	2.4270618	51.816008	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0424005	0		0	0	0	1.6431208	35.079437	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.16831	8.72115227		0	0	0	0.2660234	5.1816008	225	0%	0	0	0%	D

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Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	B	mg/kg-dr	0.18525	9.59891545		0	0	0	0.3308970	2.0726403	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	107.95302	5593.69453		0	0	0	1.1597138	19.586451	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	1.534288	79.500679		0	0	0	0.0396952	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		3.54891031		0	0	0	0.001772	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.00003	0.00155448		0	0	0	0.0012311	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		15266.6592		0	0	0	17.540472	77.692922	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	165.06	8552.75025		0	0	0	9.826595	43.525447	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	212.5552	11013.7619		0	0	0	3.2039496	14.819378	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		15221.0189		0	0	0	4.4278583	20.480381	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		2648.03363		0	0	0	8.957537	28.790798	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	24.42856	1265.79046		0	0	0	4.2818054	13.762332	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	3.021965	156.586162		0	0	0	0.0907996	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	4.795489	248.483095		0	0	0	0.6535719	47.463463	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	17.238	893.204343		0	0	0	3.1176656	62.179209	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	5.17455	268.124523		0	0	0	2.5784164	41.970966	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	0.4797408	24.8582530		0	0	0	0.0082592	1.18	100000	0%	0	0	0%	

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Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	337	19969.596		0	0	0	0.7017209	11.851392	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	4.395	260.434345		0	0	0	0.0405318	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.02282	1.35224386		0	0	0	0.0099125	1	22.5	0%	0	0	0%	
Cadmium	A	mg/kg-dr	0.00345	0.20443652		0	0	0	0.0281589	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	188.91	11194.2326		0	0	0	8.026948	35.554177	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	440.84	26122.8389		0	0	0		11.851392	1800	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	110.28	6534.85770		0	0	0	2.9498115	9.4811138	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	2.6703	158.233864		0	0	0	0.0817628	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	7.2873	431.823255		0	0	0	0.3263873	23.702785	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	48.791	2891.20640		0	0	0	2.9711440	59.256961	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	11.21	664.270537		0	0	0	2.1842116	35.554177	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	2.3281	137.956132		0	0	0	0.0080044	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.01802	1.06781044		0	0	0	0.6123614	23.702785	225	0%	0	0	0%	DJ
Arsenic	B	mg/kg-dr	0.11074	6.56211591		0	0	0	1.1472148	23.702785	225	0%	0	0	0%	DJ

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Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.005537	0.3281058		0	0	0	0.0573607	1.1851392	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.07003	4.14976501		0	0	0	0.3179729	5.9256961	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.13595	8.05598390		0	0	0	0.1133823	5.9256961	225	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.0067975	0.4027992		0	0	0	0.0056691	0.2962848	0	0%	0	0	0%	D
Cobalt	B	mg/kg-dr	0.07845	4.64870862		0	0	0	0.0682403	4.7405569	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.30355	17.9874506		0	0	0	0.1162503	5.9256961	225	0%	0	0	0%	D
Gold	B	mg/kg-dr	-0.05605	0		0	0	0	0.9460966	11.851392	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.33926	20.1035167		0	0	0	1.0138866	23.702785	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.016963	1.00517584		0	0	0	0.0506943	1.1851392	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.36457	21.6033104		0	0	0	0.0911491	5.9256961	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	1.5712967	93.1102679		0	0	0	0.3928524	25.539750	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.01317	0.78041418		0	0	0	0.1886742	3.5554177	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.16618	9.84732184		0	0	0	0.1372391	3.5554177	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	-0.00844	0		0	0	0	1.3546141	35.554177	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	-0.000422	0		0	0	0	0.0677307	1.7777088	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	10.4348037	618.334759		0	0	0	4.6242957	76.057495	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	4.8779	289.049532		0	0	0	2.161694	35.554177	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	10.4348037	618.334759		0	0	0	4.6242957	76.057495	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00202	0		0	0	0	0.3926366	5.9256961	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.000101	0		0	0	0	0.0196318	0.2962848	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.03871	2.29383698		0	0	0	0.6805069	23.702785	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.02997	0		0	0	0	1.0608181	23.702785	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.03365	1.99399675		0	0	0	0.6648631	11.851392	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.9595	56.8570545		0	0	0	0.0439924	2.3702785	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.602365	94.9512809		0	0	0	0.0734673	3.9583650	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	0.04036	0		0	0	0	2.7755961	59.256961	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	0.02732372	0		0	0	0	1.8790785	40.116963	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.46643	27.6392245		0	0	0	0.3042252	5.9256961	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	1.1323	67.0966574		0	0	0	0.378415	2.3702785	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	636.93	37742.5364		0	0	0	1.3262526	22.399131	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	4.9224	291.686467		0	0	0	0.0453956	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		13.0208839		0	0	0	0.0020265	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0001725	0.01022183		0	0	0	0.0014079	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		27974.3872		0	0	0	20.059343	88.849888	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	264.474	15671.9256		0	0	0	11.237727	49.775848	100000	0%	0	0	0%	D

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Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron as Fe2O3	C	mg/kg-dr	630.4012	37355.6596		0	0	0		16.947491	100000	0%	0	0	0%	D
Magnesium as MgCO3	C	mg/kg-dr		22693.7310		0	0	0	10.24387	32.925254	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	183.0648	10847.8638		0	0	0	4.8966872	15.738649	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	3.391281	200.957007		0	0	0	0.1038387	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	16.687917	988.875253		0	0	0	0.7474270	54.279377	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	58.5492	3469.44768		0	0	0	3.5653729	71.108354	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	15.1335	896.765225		0	0	0	2.9486857	47.998139	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	2.747158	162.788236		0	0	0	0.0094452	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685544	B18020068-011	6010.20-S	SAMP		2/6/2018 4:55:37	1	118169	2/5/2018 7:5	0	0	13.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	83.079	4585.44853		0	0	0	0.6536054	11.038767	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	1.582	87.3166453		0	0	0	0.0377526	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.00688	0.37973358		0	0	0	0.0092328	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00103	0.05684965		0	0	0	0.0262281	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	165.31	9124.09269		0	0	0	7.4765567	33.116300	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	111.31	6143.62565		0	0	0	2.3865814	11.038767	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	29.393	1622.31236		0	0	0	2.7475491	8.8310134	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	2.0109	110.989281		0	0	0	0.0761565	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	2.861	157.909559		0	0	0	0.3040076	22.077534	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	12.942	714.318599		0	0	0	2.7674188	55.193834	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	3.709	204.713930		0	0	0	2.0344447	33.116300	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.66795	36.8667214		0	0	0	0.0074556	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.00171	0		0	0	0	0.5703731	22.077534	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.04242	2.34132244		0	0	0	1.0685526	22.077534	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.002121	0.11706612		0	0	0	0.0534276	1.1038767	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.03995	2.20499367		0	0	0	0.2961701	5.5193834	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.03796	2.09515794		0	0	0	0.1056079	5.5193834	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.001898	0.1047579		0	0	0	0.0052804	0.2759692	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.0495	2.73209478		0	0	0	0.0635612	4.4155067	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.05542	3.05884228		0	0	0	0.1082793	5.5193834	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.0231	0		0	0	0	0.8812248	11.038767	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.11423	6.30479165		0	0	0	0.9443665	22.077534	900	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685544	B18020068-011	6010.20-S	SAMP		2/6/2018 4:55:37	1	118169	2/5/2018 7:5	0	0	13.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0057115	0.31523958		0	0	0	0.0472183	1.1038767	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.10062	5.55360357		0	0	0	0.0848992	5.5193834	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	0.4336722	23.9360314		0	0	0	0.3659154	23.788542	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.00405	0.22353503		0	0	0	0.1757372	3.3116300	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.06639	3.66431863		0	0	0	0.1278289	3.3116300	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	0.01289	0		0	0	0	1.2617310	33.116300	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.0006445	0		0	0	0	0.0630866	1.6558150	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	6.6871392	369.088850		0	0	0	4.3072173	70.84239	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	3.126	172.535925		0	0	0	2.0134711	33.116300	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	6.6871392	369.088850		0	0	0	4.3072173	70.84239	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00078	0		0	0	0	0.3657143	5.5193834	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.000039	0		0	0	0	0.0182857	0.2759692	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02707	1.49409708		0	0	0	0.633846	22.077534	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.00524	0		0	0	0	0.9880800	22.077534	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.023	1.26945818		0	0	0	0.6192748	11.038767	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.51038	28.169829		0	0	0	0.0409759	2.2077534	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	0.8523346	47.0436144		0	0	0	0.0684298	3.6869481	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.10254	0		0	0	0	2.5852792	55.193834	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0694196	0		0	0	0	1.7502340	37.366226	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.18718	10.3311818		0	0	0	0.2833651	5.5193834	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.29332	16.1894554		0	0	0	0.3524678	2.2077534	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	157.01931	8666.49772		0	0	0	1.2353142	20.863269	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	1.77184	97.7946427		0	0	0	0.0422829	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		4.36555285		0	0	0	0.0018875	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0000515	0.00284248		0	0	0	0.0013114	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		22801.1076		0	0	0	18.683915	82.757635	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	231.434	12773.7298		0	0	0	10.467179	46.362820	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	159.1733	8785.38469		0	0	0	3.4128114	15.785437	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		12141.4016		0	0	0	4.7165053	21.815473	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		5633.83658		0	0	0	9.5414685	30.667637	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	48.79238	2693.03852		0	0	0	4.5609314	14.659482	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	2.553843	140.956386		0	0	0	0.0967187	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	6.55169	361.61289		0	0	0	0.6961775	50.557552	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	15.5304	857.182318		0	0	0	3.3209026	66.232601	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	5.00715	276.363806		0	0	0	2.7465004	44.707005	100000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685544	B18020068-011	6010.20-S	SAMP		2/6/2018 4:55:37	1	118169	2/5/2018 7:5	0	0	13.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium as SrO	C	mg/kg-dr	0.788181	43.5027312		0	0	0	0.0087976	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685545	B18020068-012	6010.20-S	SAMP		2/6/2018 4:59:28	1	118169	2/5/2018 7:5	0	0	19.92

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	134.62	7916.15342		0	0	0	0.6963534	11.760739	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	3.1867	187.389735		0	0	0	0.0402217	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.011	0.64684064		0	0	0	0.0098367	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00231	0.13583654		0	0	0	0.0279435	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	64.706	3804.95189		0	0	0	7.9655485	35.282217	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	192.59	11325.0036		0	0	0	2.5426718	11.760739	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	48.249	2837.21948		0	0	0	2.9272479	9.4085912	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	2.0287	119.295056		0	0	0	0.0811373	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	5.4456	320.221401		0	0	0	0.3238908	23.521478	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	22.552	1326.14093		0	0	0	2.9484173	58.803695	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	4.859	285.727154		0	0	0	2.1675042	35.282217	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.85466	50.2571659		0	0	0	0.0079432	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.00028	0		0	0	0	0.6076774	23.521478	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.05299	3.1160078		0	0	0	1.1384395	23.521478	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0026495	0.15580039		0	0	0	0.056922	1.1760739	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.04951	2.91137094		0	0	0	0.3155406	5.8803695	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.07724	4.5419974		0	0	0	0.112515	5.8803695	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.003862	0.22709987		0	0	0	0.0056257	0.2940185	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.10414	6.12381679		0	0	0	0.0677183	4.7042956	450	0%	0	0	0%	D
Copper	B	mg/kg-dr	0.11361	6.68068778		0	0	0	0.1153611	5.8803695	225	0%	0	0	0%	D
Gold	B	mg/kg-dr	-0.03133	0		0	0	0	0.9388598	11.760739	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.17493	10.2865304		0	0	0	1.0061312	23.521478	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0087465	0.51432652		0	0	0	0.0503066	1.1760739	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.1672	9.8319778		0	0	0	0.0904518	5.8803695	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	0.720632	42.3758243		0	0	0	0.3898474	25.344393	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.00633	0.37222739		0	0	0	0.187231	3.5282217	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.119	6.99763970		0	0	0	0.1361894	3.5282217	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	0.0015	0		0	0	0	1.3442525	35.282217	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.000075	0		0	0	0	0.0672126	1.7641108	0	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685545	B18020068-012	6010.20-S	SAMP		2/6/2018 4:59:28	1	118169	2/5/2018 7:5	0	0	19.92

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silica	B	mg/kg-dr	7.01529248	412.525119		0	0	0	4.5889237	75.475719	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	3.2794	192.840837		0	0	0	2.1451588	35.282217	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	7.01529248	412.525119		0	0	0	4.5889237	75.475719	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00154	0		0	0	0	0.3896333	5.8803695	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.000077	0		0	0	0	0.0194817	0.2940185	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02392	1.40658438		0	0	0	0.6753016	23.521478	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.01489	0		0	0	0	1.0527037	23.521478	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02528	1.48655741		0	0	0	0.6597775	11.760739	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	1.2422	73.0459499		0	0	0	0.0436559	2.3521478	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	2.074474	121.986736		0	0	0	0.0729053	3.9280868	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.01194	0		0	0	0	2.7543651	58.803695	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0080834	0		0	0	0	1.8647052	39.810101	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.24077	14.1581656		0	0	0	0.3018982	5.8803695	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.5334	31.3658909		0	0	0	0.3755204	2.3521478	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	254.4318	14961.53		0	0	0	1.3161078	22.227797	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	3.569104	209.876503		0	0	0	0.0450483	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		9.36888709		0	0	0	0.002011	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0001155	0.00679183		0	0	0	0.0013972	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		9508.57476		0	0	0	19.905906	88.170260	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	90.5884	5326.93264		0	0	0	11.151768	49.395104	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	275.4037	16194.7552		0	0	0	3.6360206	16.817857	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		22381.1516		0	0	0	5.0249805	23.242278	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		9852.86883		0	0	0	10.165512	32.673403	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	80.09334	4709.78433		0	0	0	4.8592316	15.618261	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	2.576449	151.504721		0	0	0	0.1030444	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	12.470424	733.307009		0	0	0	0.7417098	53.864185	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	27.0624	1591.36911		0	0	0	3.5381007	70.564434	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	6.55965	385.731658		0	0	0	2.9261307	47.630993	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	1.0084988	59.3034558		0	0	0	0.009373	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685546	B18020068-013	6010.20-S	SAMP		2/6/2018 5:03:30	1	118169	2/5/2018 7:5	0	0	21.19

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685546	B18020068-013	6010.20-S	SAMP		2/6/2018 5:03:30	1	118169	2/5/2018 7:5	0	0	21.19

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	403.11	25293.4781		0	0	0	0.7430363	12.549169	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	3.7835	237.39891		0	0	0	0.0429182	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.02272	1.42558563		0	0	0	0.0104961	1	22.5	0%	0	0	0%	
Cadmium	A	mg/kg-dr	0.00405	0.25412068		0	0	0	0.0298168	1.0039335	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	323.12	20274.4379		0	0	0	8.4995524	37.647508	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	353.73	22195.0882		0	0	0	2.7131304	12.549169	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	119.78	7515.69748		0	0	0	3.1234882	10.039335	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	5.9573	373.795831		0	0	0	0.0865767	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	8.4139	527.937277		0	0	0	0.3456041	25.098339	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	67.967	4264.64694		0	0	0	3.1460767	62.745846	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	11.58	726.596901		0	0	0	2.3128119	37.647508	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	2.0182	126.633667		0	0	0	0.0084757	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.00306	0		0	0	0	0.6484156	25.098339	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.12749	7.99946795		0	0	0	1.2147596	25.098339	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0063745	0.3999734		0	0	0	0.060738	1.2549169	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.07427	4.66013401		0	0	0	0.3366942	6.2745846	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.17596	11.0407591		0	0	0	0.1200579	6.2745846	225	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.008798	0.55203796		0	0	0	0.0060029	0.3137292	0	0%	0	0	0%	D
Cobalt	B	mg/kg-dr	0.12163	7.6317773		0	0	0	0.0722581	5.0196677	450	0%	0	0	0%	D
Copper	B	mg/kg-dr	0.23785	14.9240996		0	0	0	0.1230948	6.2745846	225	0%	0	0	0%	D
Gold	B	mg/kg-dr	-0.06399	0		0	0	0	1.0018002	12.549169	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.30489	19.1305811		0	0	0	1.0735814	25.098339	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0152445	0.95652906		0	0	0	0.0536791	1.2549169	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.36823	23.1049030		0	0	0	0.0965157	6.2745846	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	1.5870713	99.582132		0	0	0	0.4159825	27.04346	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.04314	2.70685581		0	0	0	0.1997828	3.7647508	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.20792	13.0461164		0	0	0	0.1453194	3.7647508	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	-0.01976	0		0	0	0	1.4343700	37.647508	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	-0.000988	0		0	0	0	0.0717185	1.8823754	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	10.4166205	653.599668		0	0	0	4.8965614	80.535549	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	4.8694	305.534624		0	0	0	2.2889685	37.647508	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	10.4166205	653.599668		0	0	0	4.8965614	80.535549	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00169	0		0	0	0	0.415754	6.2745846	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.0000845	0		0	0	0	0.0207877	0.3137292	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.03525	2.21179108		0	0	0	0.7205733	25.098339	90	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685546	B18020068-013	6010.20-S	SAMP		2/6/2018 5:03:30	1	118169	2/5/2018 7:5	0	0	21.19

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	B	mg/kg-dr	-0.02888	0		0	0	0	1.1232761	25.098339	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.03071	1.92692494		0	0	0	0.7040084	12.549169	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.56432	35.4087360		0	0	0	0.0465825	2.5098339	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	0.9424144	59.1325892		0	0	0	0.0777928	4.1914225	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	0.11407	7.1574187		0	0	0	2.9390154	62.745846	900	0%	0	0	0%	DJ
Uranium, Activity	B	pCi/g-dry	0.07722539	4.84557246		0	0	0	1.9897135	42.478938	3	0%	0	0	0%	DJ
Vanadium	B	mg/kg-dr	0.46799	29.3644286		0	0	0	0.3221372	6.2745846	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	1.0532	66.0839254		0	0	0	0.400695	2.5098339	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	761.8779	47804.6737		0	0	0	1.4043386	23.71793	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	4.23752	265.886779		0	0	0	0.0480683	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		11.8691858		0	0	0	0.0021458	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0002025	0.01270603		0	0	0	0.0014908	0.0501967	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		50665.8203		0	0	0	21.240381	94.081122	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	452.368	28384.2130		0	0	0	11.899373	52.706511	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	505.8339	31738.9762		0	0	0	3.8797765	17.945312	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		43863.2651		0	0	0	5.3618511	24.800421	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		26099.913		0	0	0	10.847000	34.863801	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	198.8348	12476.0578		0	0	0	5.1849905	16.665297	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	7.565771	474.720705		0	0	0	0.1099524	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	19.267831	1208.97636		0	0	0	0.7914334	57.475195	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	81.5604	5117.57633		0	0	0	3.7752921	75.295016	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	15.633	980.905816		0	0	0	3.1222961	50.824136	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	2.381476	149.427727		0	0	0	0.0100013	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685547	B18020068-014	6010.20-S	SAMP		2/6/2018 5:07:59	1	118169	2/5/2018 7:5	0	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	33.899	1725.20135		0	0	0	0.6026678	10.178479	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	1.344	68.3993808		0	0	0	0.0348104	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.0031	0.15776643		0	0	0	0.0085133	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00116	0.05903518		0	0	0	0.0241841	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	251.02	12775.0093		0	0	0	6.8938840	30.535438	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	89.485	4554.10609		0	0	0	2.2005872	10.178479	360	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	13.177	670.609108		0	0	0	2.5334235	8.1427834	4500	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685547	B18020068-014	6010.20-S	SAMP		2/6/2018 5:07:59	1	118169	2/5/2018 7:5	0	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	mg/kg-dr	2.8776	146.44796		0	0	0	0.0702213	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	3.4187	173.985836		0	0	0	0.2803153	20.356959	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	5.691	289.628628		0	0	0	2.5517448	50.892396	900	0%	0	0	0%	D
Silver	A	mg/kg-dr	-0.00038	0		0	0	0	0.3372130	5.0892396	2	0%	0	0	0%	D
Sodium	A	mg/kg-dr	1.52	77.3564426		0	0	0	1.8758937	30.535438	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.53023	26.9846754		0	0	0	0.0068745	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.00661	0		0	0	0	0.5259220	20.356959	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.04663	2.37311244		0	0	0	0.9852768	20.356959	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0023315	0.11865562		0	0	0	0.0492638	1.0178479	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.02438	1.24075662		0	0	0	0.2730886	5.0892396	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.01418	0.72165418		0	0	0	0.0973775	5.0892396	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.000709	0.03608271		0	0	0	0.0048689	0.254462	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.02769	1.40921046		0	0	0	0.0586077	4.0713917	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.03129	1.59242308		0	0	0	0.0998407	5.0892396	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.02688	0		0	0	0	0.8125480	10.178479	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.06087	3.09782017		0	0	0	0.8707689	20.356959	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0030435	0.15489101		0	0	0	0.0435384	1.0178479	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.04995	2.54207520		0	0	0	0.0782827	5.0892396	22.5	0%	0	0	0%	DJ
Lithium as Li2O	B	mg/kg-dr	0.2152845	10.9563441		0	0	0	0.3373984	21.934623	10000	0%	0	0	0%	DJ
Molybdenum	B	mg/kg-dr	0.01727	0.87891169		0	0	0	0.1620414	3.0535438	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.03938	2.00414257		0	0	0	0.1178668	3.0535438	225	0%	0	0	0%	DJ
Selenium	B	mg/kg-dr	0.00438	0		0	0	0	1.1634002	30.535438	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.000219	0		0	0	0	0.0581700	1.5267719	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	6.47557232	329.557394		0	0	0	3.9715416	65.321409	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	3.0271	154.056373		0	0	0	1.8565546	30.535438	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	6.47557232	329.557394		0	0	0	3.9715416	65.321409	100000	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02434	1.23872093		0	0	0	0.5844483	20.356959	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.01351	0		0	0	0	0.9110757	20.356959	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02005	1.02039255		0	0	0	0.5710127	10.178479	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.6604	33.6093386		0	0	0	0.0377825	2.0356959	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.102868	56.1275954		0	0	0	0.0630968	3.3996121	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.05904	0		0	0	0	2.3837998	50.892396	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0399701	0		0	0	0	1.6138325	34.454152	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.13694	6.96920477		0	0	0	0.2612816	5.0892396	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.15352	7.8130007		0	0	0	0.3249988	2.0356959	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685547	B18020068-014	6010.20-S	SAMP		2/6/2018 5:07:59	1	118169	2/5/2018 7:5	0	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum as Al2O3	C	mg/kg-dr	64.06911	3260.63054		0	0	0	1.1390421	19.237326	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	1.50528	76.6073065		0	0	0	0.0389876	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		3.41975016		0	0	0	0.0017404	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.000058	0.00295176		0	0	0	0.0012092	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		31924.7484		0	0	0	17.227816	76.308059	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	351.428	17885.0131		0	0	0	9.6514376	42.749613	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	127.96355	6512.37171		0	0	0	3.1468397	14.555225	100000	0%	0	0	0%	D
Iron as Fe3O4	C	mg/kg-dr		9000.09771		0	0	0	4.3489325	20.115321	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		2328.83766		0	0	0	8.7978704	28.277607	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	21.87382	1113.21112		0	0	0	4.205483	13.517020	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	3.654552	185.988909		0	0	0	0.0891811	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	7.828823	398.427564		0	0	0	0.6419221	46.617435	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	6.8292	347.554354		0	0	0	3.0620937	61.070876	100000	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	C	mg/L-dry	-0.000019	0		0	0	0	0.0168607	0.254462	0	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	2.052	104.431197		0	0	0	2.5324565	41.222841	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	0.6256714	31.8419169		0	0	0	0.008112	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685548	B18020068-014	6010.20-S	SD		2/6/2018 5:11:48	5	118169	2/5/2018 7:5	0	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	6.9232	1761.69119		0	0	1725.2013	3.0133388	50.892396	900	0%			2%	
Antimony	A	mg/kg-dr	-0.004126	0		0	0	0	2.6296101	101.78479	225	0%				
Arsenic	A	mg/kg-dr	0.002194	0		0	0	2.3731124	4.926384	101.78479	225	0%				
Barium	A	mg/kg-dr	0.27842	70.8473050		0	0	68.399381	0.174052	2.5446198	18	0%			4%	
Beryllium	A	mg/kg-dr	0.000602	0.15318611		0	0	0.1577664	0.0425664	1.0178479	22.5	0%				N
Boron	A	mg/kg-dr	0.005684	1.44636191		0	0	1.2407566	1.365443	25.446198	450	0%				N
Cadmium	A	mg/kg-dr	0.000328	0		0	0	0.0590352	0.1209203	4.0713917	90	0%				
Calcium	A	mg/kg-dr	53.25	13550.1005		0	0	12775.009	34.469420	152.67719	900	0%			6%	
Chromium	A	mg/kg-dr	0.002126	0.54098617		0	0	0.7216542	0.4868876	25.446198	225	0%				N
Cobalt	A	mg/kg-dr	0.006246	1.58936954		0	0	1.4092105	0.2930384	20.356959	450	0%				N
Copper	A	mg/kg-dr	0.006906	1.75731445		0	0	1.5924231	0.4992035	25.446198	225	0%				N
Gold	A	mg/kg-dr	-0.0078	0		0	0	0	4.0627400	50.892396	90	0%				
Iron	A	mg/kg-dr	18.9654	4825.97327		0	0	4554.1061	11.002936	50.892396	360	0%			6%	
Lead	A	mg/kg-dr	0.016024	0		0	0	3.0978202	4.3538445	101.78479	900	0%				

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685548	B18020068-014	6010.20-S	SD		2/6/2018 5:11:48	5	118169	2/5/2018 7:5	0	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lithium	A	mg/kg-dr	0.009538	2.42705839		0	0	2.5420752	0.3914134	25.446198	22.5	0%				N
Magnesium	A	mg/kg-dr	2.8512	725.522003		0	0	670.60911	12.667117	40.713917	4500	0%			8%	
Manganese	A	mg/kg-dr	0.61918	157.557770		0	0	146.44796	0.3511066	2.5446198	45	0%			7%	
Molybdenum	A	mg/kg-dr	0.00219	0		0	0	0.8789117	0.810207	15.267719	225	0%				
Nickel	A	mg/kg-dr	0.008186	2.08302579		0	0	2.0041426	0.589334	15.267719	225	0%				N
Phosphorus	A	mg/kg-dr	0.70282	178.840970		0	0	173.98584	1.4015766	101.78479	360	0%			3%	
Potassium	A	mg/kg-dr	1.1612	295.481254		0	0	289.62863	12.758724	254.46198	900	0%			2%	
Selenium	A	mg/kg-dr	0.00971	0		0	0	0	5.8170009	152.67719	225	0%				
Silicon	A	mg/kg-dr	0.61856	157.400004		0	0	154.05637	9.2827731	152.67719	450	0%			2%	
Silver	A	mg/kg-dr	-0.001304	0		0	0	0	1.6860651	25.446198	2	0%				
Sodium	A	mg/kg-dr	0.3758	95.6268129		0	0	77.356443	9.3794687	152.67719	450	0%				N
Strontium	A	mg/kg-dr	0.110132	28.0244070		0	0	26.984675	0.0343727	1.0178479	18	0%			4%	
Tellurium	A	mg/kg-dr	0.011726	2.98382120		0	0	1.2387209	2.9222414	101.78479	90	0%				N
Thallium	A	mg/kg-dr	-0.003616	0		0	0	0	4.5553784	101.78479	225	0%				
Tin	A	mg/kg-dr	0.00644	0		0	0	1.0203925	2.8550634	50.892396	225	0%				
Titanium	A	mg/kg-dr	0.13544	34.4643309		0	0	33.609339	0.1889126	10.178479	225	0%			3%	
Uranium	A	mg/kg-dr	-0.02579	0		0	0	0	11.918999	254.46198	900	0%				
Vanadium	A	mg/kg-dr	0.028736	7.31221952		0	0	6.9692048	1.3064078	25.446198	225	0%				N
Zinc	A	mg/kg-dr	0.032624	8.30156770		0	0	7.8130007	1.6249942	10.178479	90	0%				N
Aluminum as Al2O3	C	mg/kg-dr	13.084848	3329.59636		0	0	3260.6305	5.6952103	96.186629	100000	0%			2%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0001097	0		0	0	0.1186556	0.2463192	5.0892396	0	0%				
Barium as BaO	C	mg/kg-dr	0.3118304	79.3489817		0	0	76.607306	0.1949382	2.8499742	100000	0%			4%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		3.54213854		0	0	3.4197502	0.0087020	0.1272228	0	0%			4%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0000164	0		0	0	0.0029518	0.0060460	0.2035696	0	0%				
Calcium as CaCO3	C	mg/kg-dr		33861.7013		0	0	31924.748	86.139081	381.5403	100000	0%			6%	
Calcium as CaO	C	mg/kg-dr	74.55	18970.1408		0	0	17885.013	48.257188	213.74806	100000	0%			6%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0001063	0.02704931		0	0	0.0360827	0.0243444	1.2723099	0	0%				N
Iron as Fe2O3	C	mg/kg-dr	27.120522	6901.14178		0	0	6512.3717	15.734199	72.776127	100000	0%			6%	
Iron as Fe3O4	C	mg/kg-dr		9537.37794		0	0	9000.0977	21.744663	100.57661	0	0%			6%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0008012	0		0	0	0.1548910	0.2176922	5.0892396	0	0%				
Lithium as Li2O	C	mg/kg-dr	0.04110878	10.4606216		0	0	10.956344	1.6869918	109.67311	10000	0%				N
Magnesium as MgCO3	C	mg/kg-dr		2519.53477		0	0	2328.8377	43.989352	141.38803	100000	0%			8%	
Magnesium as MgO	C	mg/kg-dr	4.732992	1204.36653		0	0	1113.2111	21.027415	67.585102	100000	0%			8%	
Manganese as MnO	C	mg/kg-dr	0.7863586	200.098368		0	0	185.98891	0.4459054	3.2316672	100000	0%			7%	
Phosphorus as P2O5	C	mg/kg-dr	1.6094578	409.545822		0	0	398.42756	3.2096104	233.08718	100000	0%			3%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685548	B18020068-014	6010.20-S	SD		2/6/2018 5:11:48	5	118169	2/5/2018 7:5	0	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium as K2O	C	mg/kg-dr	1.39344	354.577504		0	0	347.55435	15.310469	305.35438	100000	0%			2%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0004855	0		0	0	0	0.2908500	7.6338595	0	0%				
Silica	C	mg/kg-dr	1.32322355	336.710088		0	0	329.55739	19.857708	326.60704	100000	0%			2%	
Silicon as SiO2	C	mg/kg-dr	1.32322355	336.710088		0	0	329.55739	19.857708	326.60704	100000	0%			2%	
Silver, TCLP equivalent (calc)	C	mg/L-dry	-0.0000652	0		0	0	0	0.0843033	1.2723099	0	0%				
Sodium as Na2O	C	mg/kg-dr	0.50733	129.096197		0	0	104.4312	12.662283	206.11421	100000	0%				N
Strontium as SrO	C	mg/kg-dr	0.12995576	33.0688003		0	0	31.841917	0.0405598	1.2010606	100000	0%			4%	
Titanium as TiO2	C	mg/kg-dr	0.2261848	57.5554325		0	0	56.127595	0.3154840	16.998060	100000	0%			3%	
Uranium, Activity	C	pCi/g-dry	-0.0174598	0		0	0	0	8.0691625	172.27076	3	0%				

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685549	CCV	ICP-6010-W-D	CCV		2/6/2018 5:15:33	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5493	2.5493		2.5	0	0	0.0066084	0.1	18	102%	90	110	0%	
Antimony	A	mg/L	2.6007	2.6007		2.5	0	0	0.0356182	0.05	225	104%	90	110	0%	
Arsenic	A	mg/L	2.6315	2.6315		2.5	0	0	0.0231651	0.1	225	105%	90	110	0%	
Barium	A	mg/L	2.4372	2.4372		2.5	0	0	0.0003929	0.1	18	97%	90	110	0%	
Beryllium	A	mg/L	1.302	1.302		1.25	0	0	0.0002318	0.01	22.5	104%	90	110	0%	
Boron	A	mg/L	2.5957	2.5957		2.5	0	0	0.0080048	0.1	450	104%	90	110	0%	
Cadmium	A	mg/L	2.4914	2.4914		2.5	0	0	0.0010328	0.01	90	100%	90	110	0%	
Calcium	A	mg/L	25.763	25.763		25	0	0	0.1071422	1	180	103%	90	110	0%	
Chromium	A	mg/L	2.5276	2.5276		2.5	0	0	0.0010626	0.05	225	101%	90	110	0%	
Cobalt	A	mg/L	2.4582	2.4582		2.5	0	0	0.0033639	0.02	450	98%	90	110	0%	
Copper	A	mg/L	2.4702	2.4702		2.5	0	0	0.0048764	0.01	225	99%	90	110	0%	
Gold	A	mg/L	2.4698	2.4698		2.5	0	0	0.0189485	0.1	90	99%	90	110	0%	
Iron	A	mg/L	2.7145	2.7145		2.5	0	0	0.0250321	0.0250321	360	109%	90	110	0%	
Lead	A	mg/L	2.5165	2.5165		2.5	0	0	0.0187623	0.05	900	101%	90	110	0%	
Lithium	A	mg/L	1.2898	1.2898		1.25	0	0	0.0059040	0.1	22.5	103%	90	110	0%	
Magnesium	A	mg/L	25.423	25.423		25	0	0	0.0116555	1	180	102%	90	110	0%	
Manganese	A	mg/L	2.4938	2.4938		2.5	0	0	0.0010649	0.01	45	100%	90	110	0%	
Mercury	A	mg/L	1.0085	1.0085		1	0	0	0.0100947	0.02	45	101%	90	110	0%	
Molybdenum	A	mg/L	2.5974	2.5974		2.5	0	0	0.0031266	0.1	225	104%	90	110	0%	
Nickel	A	mg/L	2.4258	2.4258		2.5	0	0	0.0012530	0.05	225	97%	90	110	0%	
Phosphorus	A	mg/L	2.6293	2.6293		2.5	0	0	0.0425464	0.1	360	105%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685549	CCV	ICP-6010-W-D	CCV		2/6/2018 5:15:33	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium	A	mg/L	25.57	25.57		25	0	0	0.0854754	1	900	102%	90	110	0%	
Selenium	A	mg/L	2.4606	2.4606		2.5	0	0	0.0234201	0.1	225	98%	90	110	0%	
Silicon	A	mg/L	5.218	5.218		5	0	0	0.0487685	0.1	450	104%	90	110	0%	
Silver	A	mg/L	0.98914	0.98914		1	0	0	0.0055813	0.01	2	99%	90	110	0%	
Sodium	A	mg/L	26.31	26.31		25	0	0	0.1131395	1	450	105%	90	110	0%	
Strontium	A	mg/L	2.4436	2.4436		2.5	0	0	0.0002417	0.1	18	98%	90	110	0%	
Tellurium	A	mg/L	2.4931	2.4931		2.5	0	0	0.0301968	0.1	90	100%	90	110	0%	
Thallium	A	mg/L	2.4653	2.4653		2.5	0	0	0.0116401	0.5	225	99%	90	110	0%	
Tin	A	mg/L	2.5849	2.5849		2.5	0	0	0.0081865	0.1	225	103%	90	110	0%	
Titanium	A	mg/L	2.5817	2.5817		2.5	0	0	0.002716	0.01	225	103%	90	110	0%	
Uranium	A	mg/L	2.4488	2.4488		2.5	0	0	0.1154022	0.1154022	900	98%	90	110	0%	
Vanadium	A	mg/L	2.6048	2.6048		2.5	0	0	0.0036660	0.1	225	104%	90	110	0%	
Zinc	A	mg/L	2.5351	2.5351		2.5	0	0	0.0023364	0.01	90	101%	90	110	0%	
Silica	C	mg/L	11.1623456	11.1623456		10.7	0	0	0.1043257	0.21392	100	104%	90	110	0%	
Silicon as SiO2	C	mg/L	11.16652	11.16652		10.7	0	0	0.1043647	0.214	0	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685550	CCB	ICP-6010-W-D	CCB		2/6/2018 5:19:14	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00109	0.00109		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.00339	-0.00339		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.0005	0.0005		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00082	0.00082		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00034	0.00034		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00211	0.00211		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00096	0.00096		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.01323	0.01323		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00073	0.00073		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00065	0.00065		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00192	0.00192		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00489	0.00489		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.00229	0.00229		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00267	-0.00267		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	-0.00012	-0.00012		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685550	CCB	ICP-6010-W-D	CCB		2/6/2018 5:19:14	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium	A	mg/L	0.00855	0.00855		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00079	0.00079		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00003	0.00003		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.0009	0.0009		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00021	-0.00021		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.00151	-0.00151		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.00198	0.00198		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.01195	0.01195		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.00471	0.00471		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00094	-0.00094		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0844	0.0844		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00082	0.00082		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01931	0.01931		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00129	-0.00129		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	0.00339	0.00339		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00025	0.00025		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.01338	-0.01338		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00139	0.00139		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00063	0.00063		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.01007563	0.01007563		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0100794	0.0100794		0	0	0	0.1043647	0.214	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685551	B18020068-014	6010.20-S	PDS		2/6/2018 5:23:08	1.03	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	37.8582524	1984.49811		262.12241	1725.2013	0	0.6207478	10.483834	900		75	125	0%	A
Antimony	A	mg/kg-dr	0.94066019	49.3086250		52.424481	0	0	0.5416997	20.967667	225	94%	75	125	0%	
Arsenic	A	mg/kg-dr	1.00592233	52.7296119		52.424481	2.3731124	0	1.0148351	20.967667	225	96%	75	125	0%	
Barium	A	mg/kg-dr	2.24601942	117.73447		52.424481	68.399381	0	0.0358547	1	18	94%	75	125	0%	
Beryllium	A	mg/kg-dr	0.477	25.0039433		26.212241	0.1577664	0	0.0087687	1	22.5	95%	75	125	0%	
Boron	A	mg/kg-dr	0.98339806	51.5489083		52.424481	1.2407566	0	0.2812813	5.2419168	450	96%	75	125	0%	
Cadmium	A	mg/kg-dr	0.45338835	23.7662402		26.212241	0.0590352	0	0.0249096	1	90	90%	75	125	0%	
Calcium	A	mg/kg-dr	285.475728	14964.4002		2621.2241	12775.009	0	7.1007005	31.451501	900		75	125	0%	A
Chromium	A	mg/kg-dr	0.91782524	48.1116359		52.424481	0.7216542	0	0.1002988	5.2419168	225	90%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685551	B18020068-014	6010.20-S	PDS		2/6/2018 5:23:08	1.03	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cobalt	A	mg/kg-dr	0.89628155	46.9823336		52.424481	1.4092105	0	0.0603659	4.1935335	450	87%	75	125	0%	
Copper	A	mg/kg-dr	0.93440777	48.9808780		52.424481	1.5924231	0	0.1028359	5.2419168	225	90%	75	125	0%	
Gold	A	mg/kg-dr	0.84475728	44.2814741		52.424481	0	0	0.8369244	10.483834	90	84%	75	125	0%	
Iron	A	mg/kg-dr	86.8194175	4551.00166		262.12241	4554.1061	0	2.2666048	10.483834	360		75	125	0%	A
Lead	A	mg/kg-dr	0.94390291	49.4786056		52.424481	3.0978202	0	0.896892	20.967667	900	88%	75	125	0%	
Lithium	A	mg/kg-dr	1.04048544	54.5413812		52.424481	2.5420752	0	0.0806312	5.2419168	22.5	99%	75	125	0%	
Magnesium	A	mg/kg-dr	58.1330097	3047.28402		2621.2241	670.60911	0	2.6094262	8.3870669	4500	91%	75	125	0%	
Manganese	A	mg/kg-dr	7.20009709	377.423101		262.12241	146.44796	0	0.072328	1	45	88%	75	125	0%	
Molybdenum	A	mg/kg-dr	0.95186408	49.8959233		52.424481	0.8789117	0	0.1669026	3.1451501	225	94%	75	125	0%	
Nickel	A	mg/kg-dr	0.88670874	46.4805346		52.424481	2.0041426	0	0.1214028	3.1451501	225	85%	75	125	0%	
Phosphorus	A	mg/kg-dr	12.9145631	676.970657		524.24481	173.98584	0	0.2887248	20.967667	360	96%	75	125	0%	
Potassium	A	mg/kg-dr	53.4970874	2804.27283		2621.2241	289.62863	0	2.6282971	52.419168	900	96%	75	125	0%	
Selenium	A	mg/kg-dr	0.91236893	47.8256206		52.424481	0	0	1.1983022	31.451501	225	91%	75	125	0%	
Silicon	A	mg/kg-dr	12.4368932	651.931598		524.24481	154.05637	0	1.9122513	31.451501	450	95%	75	125	0%	
Silver	A	mg/kg-dr	0.43784466	22.9514529		26.212241	0	0	0.3473294	5.2419168	2	88%	75	125	0%	
Sodium	A	mg/kg-dr	51.0194175	2674.39543		2621.2241	77.356443	0	1.9321705	31.451501	450	99%	75	125	0%	
Strontium	A	mg/kg-dr	1.40941748	73.8804919		52.424481	26.984675	0	0.0070808	1	18	89%	75	125	0%	
Tellurium	A	mg/kg-dr	0.91927184	48.1874655		52.424481	1.2387209	0	0.6019817	20.967667	90	90%	75	125	0%	
Thallium	A	mg/kg-dr	0.85060194	44.5878463		52.424481	0	0	0.938408	20.967667	225	85%	75	125	0%	
Tin	A	mg/kg-dr	0.93106796	48.8058082		52.424481	1.0203925	0	0.5881431	10.483834	225	91%	75	125	0%	
Titanium	A	mg/kg-dr	1.56116505	81.8349734		52.424481	33.609339	0	0.038916	2.0967667	225	92%	75	125	0%	
Uranium	A	mg/kg-dr	0.8508835	44.6026051		0	0	0	2.4553138	52.419168	900	0%	75	125	0%	
Vanadium	A	mg/kg-dr	1.07757282	56.4854708		52.424481	6.9692048	0	0.2691200	5.2419168	225	94%	75	125	0%	
Zinc	A	mg/kg-dr	1.06242718	55.6915494		52.424481	7.8130007	0	0.3347488	2.0967667	90	91%	75	125	0%	
Aluminum as Al2O3	C	mg/kg-dr	71.5520971	3750.70142		0	3260.6305	0	1.1732133	19.814446	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.05029612	2.6364806		0	0.1186556	0	0.0507418	1.0483834	0	0%	0	0	0%	
Barium as BaO	C	mg/kg-dr	2.51554175	131.862606		0	76.607306	0	0.0401573	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		5.88634674		0	3.4197502	0	0.0017926	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.02266942	1.18831201		0	0.0029518	0	0.0012455	0.05	0	0%	0	0	0%	
Calcium as CaCO3	C	mg/kg-dr		37396.0362		0	31924.748	0	17.744651	78.597301	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	399.666019	20950.1603		0	17885.013	0	9.9409808	44.032101	100000	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.04589126	2.40558179		0	0.0360827	0	0.0050149	0.2620958	0	0%	0	0	0%	
Iron as Fe2O3	C	mg/kg-dr	124.151767	6507.93237		0	6512.3717	0	3.2412449	14.991882	100000	0%	0	0	0%	
Iron as Fe3O4	C	mg/kg-dr		8993.96253		0	9000.0977	0	4.4794005	20.718781	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.04719515	2.47393028		0	0.1548910	0	0.0448446	1.0483834	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685551	B18020068-014	6010.20-S	PDS		2/6/2018 5:23:08	1.03	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lithium as Li2O	C	mg/kg-dr	4.48449223	235.073353		0	10.956344	0	0.3475203	22.592662	10000	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		10582.3642		0	2328.8377	0	9.0618065	29.125935	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	96.5007961	5058.49147		0	1113.2111	0	4.3316475	13.922531	100000	0%	0	0	0%	
Manganese as MnO	C	mg/kg-dr	9.14412330	479.327338		0	185.98891	0	0.0918565	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	29.5743495	1550.26280		0	398.42756	0	0.6611797	48.015958	100000	0%	0	0	0%	
Potassium as K2O	C	mg/kg-dr	64.1965049	3365.12739		0	347.55435	0	3.1539565	62.903002	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.04561845	2.39128103		0	0	0	0.0599151	1.5725750	0	0%	0	0	0%	
Silica	C	mg/kg-dr	26.6050019	1394.61207		1121.8839	329.55739	0	4.0906879	67.281051	100000	95%	75	125	0%	
Silicon as SiO2	C	mg/kg-dr	26.6050019	1394.61207		1121.8839	329.55739	0	4.0906879	67.281051	100000	95%	75	125	0%	
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.02189223	1.14757265		0	0	0	0.0173665	0.2620958	0	0%	0	0	0%	
Sodium as Na2O	C	mg/kg-dr	68.8762136	3610.43383		0	104.4312	0	2.6084302	42.459526	100000	0%	0	0	0%	
Strontium as SrO	C	mg/kg-dr	1.66311262	87.1789804		0	31.841917	0	0.0083553	1.18	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	2.60714563	136.664406		0	56.127595	0	0.0649897	3.5016004	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g-dry	0.57604813	30.1959637		0	0	0	1.6622475	35.487777	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685552	B18020068-014	6010.20-S	MS3		2/6/2018 5:27:06	1	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	73.197	3764.43871		257.11854	1725.2013	0	0.6090206	10.285773	900		75	125	0%	A
Antimony	A	mg/kg-dr	0.66324	34.1096811		51.423708	0	0	0.5314659	20.571546	225	66%	75	125	0%	S
Arsenic	A	mg/kg-dr	1.0842	55.7591765		51.423708	2.3731124	0	0.9956628	20.571546	225	104%	75	125	0%	
Barium	A	mg/kg-dr	2.2095	113.632079		51.423708	68.399381	0	0.0351773	1	18	88%	75	125	0%	
Beryllium	A	mg/kg-dr	0.4855	24.9687145		25.711854	0.1577664	0	0.0086030	1	22.5	96%	75	125	0%	
Boron	A	mg/kg-dr	0.99018	50.9238346		51.423708	1.2407566	0	0.2759673	5.1428866	450	97%	75	125	0%	
Cadmium	A	mg/kg-dr	0.45724	23.5153347		25.711854	0.0590352	0	0.024439	1	90	91%	75	125	0%	
Calcium	A	mg/kg-dr	231.25	11892.9253		2571.1854	12775.009	0	6.9665542	30.85732	900		75	125	0%	A
Chromium	A	mg/kg-dr	0.93247	47.9558747		51.423708	0.7216542	0	0.098404	5.1428866	225	92%	75	125	0%	
Cobalt	A	mg/kg-dr	0.90869	46.7328963		51.423708	1.4092105	0	0.0592255	4.1143093	450	88%	75	125	0%	
Copper	A	mg/kg-dr	0.95253	48.9875378		51.423708	1.5924231	0	0.1008931	5.1428866	225	92%	75	125	0%	
Gold	A	mg/kg-dr	0.86548	44.510655		51.423708	0	0	0.8211133	10.285773	90	87%	75	125	0%	
Iron	A	mg/kg-dr	160.41	8249.7044		257.11854	4554.1061	0	2.2237842	10.285773	360		75	125	0%	A
Lead	A	mg/kg-dr	0.98561	50.6888046		51.423708	3.0978202	0	0.8799479	20.571546	900	93%	75	125	0%	
Lithium	A	mg/kg-dr	1.0708	55.0700297		51.423708	2.5420752	0	0.0791079	5.1428866	22.5	102%	75	125	0%	
Magnesium	A	mg/kg-dr	65.17	3351.6192		2571.1854	670.60911	0	2.560129	8.2286186	4500	104%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685552	B18020068-014	6010.20-S	MS3		2/6/2018 5:27:06	1	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	mg/kg-dr	8.0682	414.938377		257.11854	146.44796	0	0.0709615	1	45	104%	75	125	0%	
Molybdenum	A	mg/kg-dr	0.95766	49.2513678		51.423708	0.8789117	0	0.1637495	3.085732	225	94%	75	125	0%	
Nickel	A	mg/kg-dr	0.9044	46.5122664		51.423708	2.0041426	0	0.1191093	3.085732	225	87%	75	125	0%	
Phosphorus	A	mg/kg-dr	12.738	655.100895		514.23708	173.98584	0	0.2832702	20.571546	360	94%	75	125	0%	
Potassium	A	mg/kg-dr	59.721	3071.38331		2571.1854	289.62863	0	2.5786433	51.428866	900	108%	75	125	0%	
Selenium	A	mg/kg-dr	0.9145	47.031698		51.423708	0	0	1.1756639	30.85732	225	91%	75	125	0%	
Silicon	A	mg/kg-dr	3.9323	202.23373		514.23708	154.05637	0	1.8761250	30.85732	450	9%	75	125	0%	S
Silver	A	mg/kg-dr	0.434	22.3201279		25.711854	0	0	0.3407677	5.1428866	2	87%	75	125	0%	
Sodium	A	mg/kg-dr	51.73	2660.41524		2571.1854	77.356443	0	1.8956680	30.85732	450	100%	75	125	0%	
Strontium	A	mg/kg-dr	1.3422	69.027824		51.423708	26.984675	0	0.0069470	1	18	82%	75	125	0%	
Tellurium	A	mg/kg-dr	0.95958	49.3501113		51.423708	1.2387209	0	0.5906091	20.571546	90	94%	75	125	0%	
Thallium	A	mg/kg-dr	0.86383	44.4257973		51.423708	0	0	0.9206796	20.571546	225	86%	75	125	0%	
Tin	A	mg/kg-dr	0.93727	48.2027333		51.423708	1.0203925	0	0.5770319	10.285773	225	92%	75	125	0%	
Titanium	A	mg/kg-dr	2.5703	132.187614		51.423708	33.609339	0	0.0381808	2.0571546	225	192%	75	125	0%	S
Uranium	A	mg/kg-dr	1.0236	52.6425873		51.423708	0	0	2.4089281	51.428866	900	102%	75	125	0%	
Vanadium	A	mg/kg-dr	1.2321	63.3655058		51.423708	6.9692048	0	0.2640358	5.1428866	225	110%	75	125	0%	
Zinc	A	mg/kg-dr	1.1291	58.0683326		51.423708	7.8130007	0	0.3284247	2.0571546	90	98%	75	125	0%	
Aluminum as Al2O3	C	mg/kg-dr	138.34233	7114.78916		0	3260.6305	0	1.151049	19.440111	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.05421	2.78795883		0	0.1186556	0	0.0497831	1.0285773	0	0%	0	0	0%	
Barium as BaO	C	mg/kg-dr	2.47464	127.267929		0	76.607306	0	0.0393986	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		5.68124035		0	3.4197502	0	0.0017588	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.022862	1.17576674		0	0.0029518	0	0.0012219	0.05	0	0%	0	0	0%	
Calcium as CaCO3	C	mg/kg-dr		29720.4202		0	31924.748	0	17.409419	77.112442	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	323.75	16650.0954		0	17885.013	0	9.7531759	43.200247	100000	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0466235	2.39779374		0	0.0360827	0	0.0049202	0.2571443	0	0%	0	0	0%	
Iron as Fe2O3	C	mg/kg-dr	229.3863	11797.0773		0	6512.3717	0	3.1800114	14.708656	100000	0%	0	0	0%	
Iron as Fe3O4	C	mg/kg-dr		16303.5608		0	9000.0977	0	4.3947757	20.327362	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0492805	2.53444023		0	0.1548910	0	0.0439974	1.0285773	0	0%	0	0	0%	
Lithium as Li2O	C	mg/kg-dr	4.615148	237.351828		0	10.956344	0	0.340955	22.165841	10000	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		11639.2350		0	2328.8377	0	8.8906110	28.575688	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	108.1822	5563.68787		0	1113.2111	0	4.2498141	13.659507	100000	0%	0	0	0%	
Manganese as MnO	C	mg/kg-dr	10.246614	526.971739		0	185.98891	0	0.0901212	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	29.17002	1500.18105		0	398.42756	0	0.6486887	47.108841	100000	0%	0	0	0%	
Potassium as K2O	C	mg/kg-dr	71.6652	3685.65997		0	347.55435	0	3.0943720	61.714639	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.045725	2.3515849		0	0	0	0.0587832	1.542866	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685552	B18020068-014	6010.20-S	MS3		2/6/2018 5:27:06	1	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silica	C	mg/kg-dr	8.41197616	432.618395		220.09347	329.55739	0	4.0134067	66.009978	100000	47%	75	125	0%	S
Silicon as SiO2	C	mg/kg-dr	8.41197616	432.618395		220.09347	329.55739	0	4.0134067	66.009978	100000	47%	75	125	0%	S
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0217	1.11600639		0	0	0	0.0170384	0.2571443	0	0%	0	0	0%	
Sodium as Na2O	C	mg/kg-dr	69.8355	3591.56057		0	104.4312	0	2.5591518	41.657381	100000	0%	0	0	0%	
Strontium as SrO	C	mg/kg-dr	1.583796	81.4528323		0	31.841917	0	0.0081975	1.18	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	4.292401	220.753316		0	56.127595	0	0.0637619	3.4354483	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g-dry	0.6929772	35.6390316		0	0	0	1.6308443	34.817342	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685553	B18020068-014	6010.20-S	MSD3		2/6/2018 5:31:14	1	118169	2/5/2018 7:5	1E+07	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	86.376	4439.54638		256.98958	1725.2013	3764.4387	0.6086541	10.279583	900		75	125	16%	A
Antimony	A	mg/kg-dr	0.58942	30.2949596		51.397916	0	34.109681	0.5311461	20.559166	225	59%	75	125	12%	S
Arsenic	A	mg/kg-dr	1.0461	53.7673598		51.397916	2.3731124	55.759177	0.9950637	20.559166	225	100%	75	125	4%	
Barium	A	mg/kg-dr	2.4772	127.322917		51.397916	68.399381	113.63208	0.0351562	1	18	115%	75	125	11%	
Beryllium	A	mg/kg-dr	0.4771	24.5219457		25.698958	0.1577664	24.968714	0.0085978	1	22.5	95%	75	125	2%	
Boron	A	mg/kg-dr	0.98332	50.5405986		51.397916	1.2407566	50.923835	0.2758012	5.1397916	450	96%	75	125	1%	
Cadmium	A	mg/kg-dr	0.44868	23.0612169		25.698958	0.0590352	23.515335	0.0244243	1	90	90%	75	125	2%	
Calcium	A	mg/kg-dr	557.88	28673.8693		2569.8958	12775.009	11892.925	6.9623617	30.83875	900		75	125	83%	AR
Chromium	A	mg/kg-dr	0.91192	46.8707874		51.397916	0.7216542	47.955875	0.0983448	5.1397916	225	90%	75	125	2%	
Cobalt	A	mg/kg-dr	0.87148	44.7922557		51.397916	1.4092105	46.732896	0.0591898	4.1118333	450	84%	75	125	4%	
Copper	A	mg/kg-dr	0.93547	48.0812083		51.397916	1.5924231	48.987538	0.1008324	5.1397916	225	90%	75	125	2%	
Gold	A	mg/kg-dr	0.83765	43.0534642		51.397916	0	44.510655	0.8206191	10.279583	90	84%	75	125	3%	
Iron	A	mg/kg-dr	109.96	5651.71483		256.98958	4554.1061	8249.7044	2.2224459	10.279583	360		75	125	37%	AR
Lead	A	mg/kg-dr	0.94384	48.5114089		51.397916	3.0978202	50.688805	0.8794183	20.559166	900	88%	75	125	4%	
Lithium	A	mg/kg-dr	1.0735	55.1756627		51.397916	2.5420752	55.07003	0.0790603	5.1397916	22.5	102%	75	125	0%	
Magnesium	A	mg/kg-dr	68.563	3523.99531		2569.8958	670.60911	3351.6192	2.5585883	8.2236665	4500	111%	75	125	5%	
Manganese	A	mg/kg-dr	7.8032	401.068217		256.98958	146.44796	414.93838	0.0709188	1	45	99%	75	125	3%	
Molybdenum	A	mg/kg-dr	0.91645	47.10362		51.397916	0.8789117	49.251368	0.163651	3.083875	225	90%	75	125	4%	
Nickel	A	mg/kg-dr	0.86491	44.4545714		51.397916	2.0041426	46.512266	0.1190376	3.083875	225	83%	75	125	5%	
Phosphorus	A	mg/kg-dr	12.207	627.414359		513.97916	173.98584	655.1009	0.2830997	20.559166	360	88%	75	125	4%	
Potassium	A	mg/kg-dr	62.148	3194.27767		2569.8958	289.62863	3071.3833	2.5770915	51.397916	900	113%	75	125	4%	
Selenium	A	mg/kg-dr	0.90587	46.5598300		51.397916	0	47.031698	1.1749564	30.83875	225	91%	75	125	1%	
Silicon	A	mg/kg-dr	5.2171	268.148067		513.97916	154.05637	202.23373	1.874996	30.83875	450	22%	75	125	28%	SR

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685553	B18020068-014	6010.20-S	MSD3		2/6/2018 5:31:14	1	118169	2/5/2018 7:5	1E+07	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/kg-dr	0.42565	21.8775229		25.698958	0	22.320128	0.3405626	5.1397916	2	85%	75	125	2%	
Sodium	A	mg/kg-dr	51.56	2650.07654		2569.8958	77.356443	2660.4152	1.8945272	30.83875	450	100%	75	125	0%	
Strontium	A	mg/kg-dr	2.2484	115.563074		51.397916	26.984675	69.027824	0.0069428	1	18	172%	75	125	50%	SR
Tellurium	A	mg/kg-dr	0.93937	48.2816602		51.397916	1.2387209	49.350111	0.5902537	20.559166	90	92%	75	125	2%	
Thallium	A	mg/kg-dr	0.82323	42.3123063		51.397916	0	44.425797	0.9201255	20.559166	225	82%	75	125	5%	
Tin	A	mg/kg-dr	0.90452	46.4904429		51.397916	1.0203925	48.202733	0.5766846	10.279583	225	88%	75	125	4%	
Titanium	A	mg/kg-dr	2.5303	130.052147		51.397916	33.609339	132.18761	0.0381578	2.0559166	225	188%	75	125	2%	S
Uranium	A	mg/kg-dr	0.92812	47.7034337		51.397916	0	52.642587	2.4074784	51.397916	900	93%	75	125		
Vanadium	A	mg/kg-dr	1.1204	57.5862249		51.397916	6.9692048	63.365506	0.2638769	5.1397916	225	98%	75	125	10%	
Zinc	A	mg/kg-dr	1.1359	58.3828926		51.397916	7.8130007	58.068333	0.3282271	2.0559166	90	98%	75	125	1%	
Aluminum as Al2O3	C	mg/kg-dr	163.25064	8390.74266		0	3260.6305	7114.7892	1.1503563	19.428412	100000	0%	0	0	16%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.052305	2.68836799		0	0.1186556	2.7879588	0.0497532	1.0279583	0	0%	0	0	4%	
Barium as BaO	C	mg/kg-dr	2.774464	142.601667		0	76.607306	127.26793	0.0393749	1.12	100000	0%	0	0	11%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		6.36573843		0	3.4197502	5.6812404	0.0017577	0.0499968	0	0%	0	0	11%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.022434	1.15306084		0	0.0029518	1.1757667	0.0012212	0.05	0	0%	0	0	2%	
Calcium as CaCO3	C	mg/kg-dr		71655.9994		0	31924.748	29720.420	17.398942	77.066035	100000	0%	0	0	83%	
Calcium as CaO	C	mg/kg-dr	781.032	40143.4170		0	17885.013	16650.095	9.7473064	43.174249	100000	0%	0	0	83%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.045596	2.34353937		0	0.0360827	2.3977937	0.0049172	0.2569896	0	0%	0	0	2%	
Iron as Fe2O3	C	mg/kg-dr	157.2428	8081.95220		0	6512.3717	11797.077	3.1780976	14.699804	100000	0%	0	0	37%	
Iron as Fe3O4	C	mg/kg-dr		11169.2579		0	9000.0977	16303.561	4.3921309	20.315129	0	0%	0	0	37%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.047192	2.42557045		0	0.1548910	2.5344402	0.0439709	1.0279583	0	0%	0	0	4%	
Lithium as Li2O	C	mg/kg-dr	4.626785	237.807106		0	10.956344	237.35183	0.3407498	22.152502	10000	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg-dr		12237.849		0	2328.8377	11639.235	8.8852606	28.558491	100000	0%	0	0	5%	
Magnesium as MgO	C	mg/kg-dr	113.81458	5849.83221		0	1113.2111	5563.6879	4.2472565	13.651286	100000	0%	0	0	5%	
Manganese as MnO	C	mg/kg-dr	9.910064	509.356636		0	185.98891	526.97174	0.0900669	1.27	100000	0%	0	0	3%	
Phosphorus as P2O5	C	mg/kg-dr	27.95403	1436.77888		0	398.42756	1500.1811	0.6482984	47.080491	100000	0%	0	0	4%	
Potassium as K2O	C	mg/kg-dr	74.5776	3833.13321		0	347.55435	3685.66	3.0925098	61.677499	100000	0%	0	0	4%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0452935	2.32799150		0	0	2.3515849	0.0587478	1.5419375	0	0%	0	0	1%	
Silica	C	mg/kg-dr	11.1604203	573.622345		1099.9154	329.55739	432.61839	4.0109914	65.970253	100000	22%	75	125	28%	SR
Silicon as SiO2	C	mg/kg-dr	11.1604203	573.622345		1099.9154	329.55739	432.61839	4.0109914	65.970253	100000	22%	75	125	28%	SR
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0212825	1.09387614		0	0	1.1160064	0.0170281	0.2569896	0	0%	0	0	2%	
Sodium as Na2O	C	mg/kg-dr	69.606	3577.60333		0	104.4312	3591.5606	2.5576117	41.632312	100000	0%	0	0	0%	
Strontium as SrO	C	mg/kg-dr	2.653112	136.364427		0	31.841917	81.452832	0.0081925	1.18	100000	0%	0	0	50%	
Titanium as TiO2	C	mg/kg-dr	4.225601	217.187085		0	56.127595	220.75332	0.0637235	3.4333808	100000	0%	75	0	2%	
Uranium, Activity	C	pCi/g-dry	0.62833724	32.2952246		0	0	35.639032	1.6298629	34.796389	3	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685554	B18020068-015	6010.20-S	SAMP		2/6/2018 5:35:12	1	118169	2/5/2018 7:5	0	0	18.13

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	131.3	7938.62194		0	0	0	0.7159875	12.092341	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	4.145	250.61377		0	0	0	0.0413558	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.0106	0.64089408		0	0	0	0.0101140	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00162	0.09794796		0	0	0	0.0287314	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	72.193	4364.91191		0	0	0	8.1901426	36.277023	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	182.36	11025.7966		0	0	0		12.092341	1800	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	51.234	3097.69502		0	0	0	3.0097837	9.6738729	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	1.6209	98.0023785		0	0	0	0.0834251	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	5.5654	336.493576		0	0	0	0.3330231	24.184682	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	22.713	1373.26672		0	0	0	3.0315499	60.461706	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	4.823	291.606806		0	0	0	2.2286185	36.277023	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	0.90526	54.7335636		0	0	0	0.0081672	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.00027	0		0	0	0	0.6248113	24.184682	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.06806	4.11502368		0	0	0	1.1705386	24.184682	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.003403	0.20575118		0	0	0	0.0585269	1.2092341	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.05506	3.32902151		0	0	0	0.3244375	6.0461706	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.07733	4.67550369		0	0	0	0.1156874	6.0461706	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.0038665	0.23377518		0	0	0	0.0057844	0.3023085	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.075	4.53462792		0	0	0	0.0696277	4.8369364	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.1065	6.43917164		0	0	0	0.1186138	6.0461706	225	0%	0	0	0%	D
Gold	B	mg/kg-dr	-0.02021	0		0	0	0	0.9653316	12.092341	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.1646	9.95199673		0	0	0	1.0344998	24.184682	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.00823	0.49759984		0	0	0	0.051725	1.2092341	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.16346	9.88307039		0	0	0	0.0930022	6.0461706	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	0.7045126	42.5960334		0	0	0	0.4008395	26.058995	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.00586	0.35430559		0	0	0	0.1925101	3.6277023	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.09994	6.04254285		0	0	0	0.1400293	3.6277023	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	-0.01197	0		0	0	0	1.3821546	36.277023	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	-0.0005985	0		0	0	0	0.0691077	1.8138512	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	7.46644976	451.434287		0	0	0	4.7183115	77.603808	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	3.4903	211.029491		0	0	0	2.2056430	36.277023	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	7.46644976	451.434287		0	0	0	4.7183115	77.603808	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	0.00029	0		0	0	0	0.4006193	6.0461706	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	0.0000145	0		0	0	0	0.020031	0.3023085	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02574	1.55628430		0	0	0	0.6943422	24.184682	90	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685554	B18020068-015	6010.20-S	SAMP		2/6/2018 5:35:12	1	118169	2/5/2018 7:5	0	0	18.13

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	B	mg/kg-dr	-0.01102	0		0	0	0	1.0823855	24.184682	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02729	1.64999994		0	0	0	0.6783803	12.092341	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	1.2105	73.1888946		0	0	0	0.0448868	2.4184682	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	2.021535	122.225454		0	0	0	0.0749609	4.0388419	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	0.00408	0		0	0	0	2.8320263	60.461706	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	0.00276216	0		0	0	0	1.9172818	40.932575	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.2334	14.1117621		0	0	0	0.3104104	6.0461706	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.49964	30.2090866		0	0	0	0.3861085	2.4184682	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	248.157	15003.9955		0	0	0	1.3532164	22.854525	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	4.6424	280.687422		0	0	0	0.0463185	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		12.5298865		0	0	0	0.0020677	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.000081	0.0048974		0	0	0	0.0014366	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		10907.9149		0	0	0	20.467166	90.656281	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	101.0702	6110.87667		0	0	0	11.4662	50.787833	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	260.7748	15766.8892		0	0	0		17.292048	100000	0%	0	0	0%	D
Magnesium as MgCO3	C	mg/kg-dr		10757.4275		0	0	0	10.452136	33.594652	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	85.04844	5142.17374		0	0	0	4.9962409	16.058629	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	2.058543	124.463021		0	0	0	0.1059498	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	12.744766	770.570289		0	0	0	0.7626228	55.382922	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	27.2556	1647.92006		0	0	0	3.6378599	72.554047	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	6.51105	393.669188		0	0	0	3.0086349	48.973982	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	1.0682068	64.5856050		0	0	0	0.0096373	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685555	B18020068-016	6010.20-S	SAMP		2/6/2018 5:39:16	1	118169	2/5/2018 7:5	0	0	21.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	382.1	23571.5441		0	0	0	0.7305266	12.337893	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	3.2682	201.613505		0	0	0	0.0421956	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.02198	1.35593441		0	0	0	0.0103194	1	22.5	0%	0	0	0%	
Cadmium	A	mg/kg-dr	0.0048	0.29610943		0	0	0	0.0293148	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	336.83	20778.8621		0	0	0	8.3564548	37.013678	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	338.48	20880.6497		0	0	0		12.337893	1800	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	130.3	8038.13712		0	0	0	3.0709015	9.8703142	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	5.2592	324.437228		0	0	0	0.0851191	1	45	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685555	B18020068-016	6010.20-S	SAMP		2/6/2018 5:39:16	1	118169	2/5/2018 7:5	0	0	21.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Phosphorus	A	mg/kg-dr	8.0652	497.537863		0	0	0	0.3397856	24.675785	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	54.438	3358.25103		0	0	0	3.0931097	61.689464	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	11.27	695.240256		0	0	0	2.2738736	37.013678	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	2.4846	153.273642		0	0	0	0.0083330	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.00351	0		0	0	0	0.6374989	24.675785	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.04547	2.80501992		0	0	0	1.1943080	24.675785	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0022735	0.140251		0	0	0	0.0597154	1.2337893	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.11048	6.81545195		0	0	0	0.3310257	6.1689464	450	0%	0	0	0%	D
Chromium	B	mg/kg-dr	0.18542	11.4384604		0	0	0	0.1180366	6.1689464	225	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.009271	0.57192302		0	0	0	0.0059018	0.3084473	0	0%	0	0	0%	D
Cobalt	B	mg/kg-dr	0.1279	7.89008241		0	0	0	0.0710416	4.9351571	450	0%	0	0	0%	D
Copper	B	mg/kg-dr	0.21983	13.5611948		0	0	0	0.1210224	6.1689464	225	0%	0	0	0%	D
Gold	B	mg/kg-dr	-0.05813	0		0	0	0	0.984934	12.337893	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.30322	18.7054792		0	0	0	1.0555067	24.675785	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.015161	0.93527396		0	0	0	0.0527753	1.2337893	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.35062	21.6295598		0	0	0	0.0948907	6.1689464	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	1.5111722	93.2234026		0	0	0	0.4089791	26.588159	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.00632	0.38987741		0	0	0	0.1964193	3.7013678	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.23441	14.4606272		0	0	0	0.1428728	3.7013678	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	-0.01042	0		0	0	0	1.4102211	37.013678	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	-0.000521	0		0	0	0	0.0705111	1.8506839	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	14.0230978	865.077381		0	0	0	4.8141234	79.179660	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	6.5553	404.392942		0	0	0	2.2504316	37.013678	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	14.0230978	865.077381		0	0	0	4.8141234	79.179660	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00097	0		0	0	0	0.4087544	6.1689464	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.0000485	0		0	0	0	0.0204377	0.3084473	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02528	1.55950964		0	0	0	0.7084418	24.675785	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.02105	0		0	0	0	1.1043648	24.675785	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.03172	1.95678979		0	0	0	0.6921558	12.337893	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	0.7865	48.5187632		0	0	0	0.0457983	2.4675785	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	1.313455	81.0263346		0	0	0	0.0764831	4.1208562	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.03759	0		0	0	0	2.8895345	61.689464	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0254484	0		0	0	0	1.9562148	41.763767	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.40076	24.7226695		0	0	0	0.3167137	6.1689464	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.83732	51.6538218		0	0	0	0.3939489	2.4675785	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685555	B18020068-016	6010.20-S	SAMP		2/6/2018 5:39:16	1	118169	2/5/2018 7:5	0	0	21.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum as Al2O3	C	mg/kg-dr	722.169	44550.2183		0	0	0	1.3806953	23.318617	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	3.660384	225.807126		0	0	0	0.0472591	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		10.0800301		0	0	0	0.0021096	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.00024	0.01480547		0	0	0	0.0014657	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		51926.3763		0	0	0	20.882780	92.497182	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	471.562	29090.4069		0	0	0	11.699037	51.81915	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	484.0264	29859.3290		0	0	0		17.643187	100000	0%	0	0	0%	D
Magnesium as MgCO3	C	mg/kg-dr		27914.1996		0	0	0	10.664381	34.276838	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	216.298	13343.3076		0	0	0	5.0976965	16.384722	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	6.679184	412.035279		0	0	0	0.1081013	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	18.469308	1139.36171		0	0	0	0.7781089	56.507549	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	65.3256	4029.90123		0	0	0	3.7117317	74.027356	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	15.2145	938.574346		0	0	0	3.0697294	49.968466	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	2.931828	180.862897		0	0	0	0.009833	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685556	B18020068-017	6010.20-S	SAMP		2/6/2018 5:43:44	1	118169	2/5/2018 7:5	0	0	11.51

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	40.9	2292.50768		0	0	0	0.6637622	11.210307	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	3.49	195.619849		0	0	0	0.0383392	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.01152	0.64571366		0	0	0	0.0093763	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.00395	0.22140355		0	0	0	0.0266357	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	758.96	42540.8712		0	0	0	7.5927406	33.63092	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	761.83	42701.7391		0	0	0		11.210307	1800	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	29.51	1654.08073		0	0	0	2.7902453	8.9682452	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	20.901	1171.53308		0	0	0	0.0773399	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	10.238	573.855591		0	0	0	0.3087318	22.420613	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	5.2839	296.170693		0	0	0	2.8104238	56.051533	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	2.846	159.522662		0	0	0	2.0660595	33.63092	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	1.726	96.7449453		0	0	0	0.0075714	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.00621	0		0	0	0	0.5792365	22.420613	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.13007	7.29062285		0	0	0	1.0851577	22.420613	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0065035	0.36453114		0	0	0	0.0542579	1.1210307	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.02039	1.14289075		0	0	0	0.3007725	5.6051533	450	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685556	B18020068-017	6010.20-S	SAMP		2/6/2018 5:43:44	1	118169	2/5/2018 7:5	0	0	11.51

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	B	mg/kg-dr	-0.09702	0		0	0	0	0.1072490	5.6051533	225	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	B	mg/L-dry	-0.004851	0		0	0	0	0.0053625	0.2802577	0	0%	0	0	0%	D
Cobalt	B	mg/kg-dr	0.10139	5.68306489		0	0	0	0.0645489	4.4841226	450	0%	0	0	0%	D
Copper	B	mg/kg-dr	0.06372	3.57160366		0	0	0	0.1099619	5.6051533	225	0%	0	0	0%	DJ
Gold	B	mg/kg-dr	-0.17456	0		0	0	0	0.8949188	11.210307	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.13167	7.3803053		0	0	0	0.9590417	22.420613	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0065835	0.36901526		0	0	0	0.0479521	1.1210307	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.10191	5.71221169		0	0	0	0.0862185	5.6051533	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg-dr	0.4392321	24.6196324		0	0	0	0.3716016	24.158211	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.01869	1.04760314		0	0	0	0.1784681	3.363092	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.11488	6.43920007		0	0	0	0.1298153	3.363092	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	-0.01195	0		0	0	0	1.2813380	33.63092	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	-0.0005975	0		0	0	0	0.0640669	1.681546	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	5.00444448	280.506783		0	0	0	4.3741504	71.943263	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	2.3394	131.126955		0	0	0	2.0447599	33.63092	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	5.00444448	280.506783		0	0	0	4.3741504	71.943263	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	0.00111	0		0	0	0	0.3713975	5.6051533	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	0.0000555	0		0	0	0	0.0185699	0.2802577	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.04758	2.66693192		0	0	0	0.6436958	22.420613	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.06715	0		0	0	0	1.0034345	22.420613	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02481	1.39063852		0	0	0	0.6288982	11.210307	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	3.9352	220.573991		0	0	0	0.0416127	2.2420613	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	6.571784	368.358565		0	0	0	0.0694931	3.7442424	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.04204	0		0	0	0	2.6254538	56.051533	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.0284611	0		0	0	0	1.7774322	37.946888	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.33458	18.7537218		0	0	0	0.2877686	5.6051533	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.54451	30.5206200		0	0	0	0.3579451	2.2420613	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	77.301	4332.83952		0	0	0	1.2545107	21.187479	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	3.9088	219.094231		0	0	0	0.04294	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		9.78036646		0	0	0	0.0019168	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0001975	0.01107018		0	0	0	0.0013318	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		106309.637		0	0	0	18.974259	84.043668	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	1062.544	59557.2197		0	0	0	10.629837	47.083287	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	1089.4169	61063.4869		0	0	0		16.030738	100000	0%	0	0	0%	D
Magnesium as MgCO3	C	mg/kg-dr		5744.15922		0	0	0	9.6897406	31.144205	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685556	B18020068-017	6010.20-S	SAMP		2/6/2018 5:43:44	1	118169	2/5/2018 7:5	0	0	11.51

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium as MgO	C	mg/kg-dr	48.9866	2745.77401		0	0	0	4.6318072	14.887287	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	26.54427	1487.84702		0	0	0	0.0982217	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	23.44502	1314.12930		0	0	0	0.7069959	51.343204	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	6.34068	355.404832		0	0	0	3.3725086	67.261839	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	3.8421	215.355593		0	0	0	2.7891803	45.401741	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	2.03668	114.159035		0	0	0	0.0089343	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685557	B18020068-018	6010.20-S	SAMP		2/6/2018 5:47:57	1	118169	2/5/2018 7:5	0	0	15.08

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	132.88	7606.33177		0	0	0	0.6778611	11.448422	900	0%	0	0	0%	D
Barium	A	mg/kg-dr	1.2055	69.0053654		0	0	0	0.0391536	1	18	0%	0	0	0%	
Beryllium	A	mg/kg-dr	0.01083	0.61993207		0	0	0	0.0095755	1	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg-dr	0.0023	0.13165686		0	0	0	0.0272015	1	90	0%	0	0	0%	J
Calcium	A	mg/kg-dr	384.48	22008.4470		0	0	0	7.7540164	34.345267	900	0%	0	0	0%	D
Iron	A	mg/kg-dr	194.55	11136.4528		0	0	0		11.448422	1800	0%	0	0	0%	D
Magnesium	A	mg/kg-dr	69.818	3996.52974		0	0	0	2.8495123	9.1587378	4500	0%	0	0	0%	D
Manganese	A	mg/kg-dr	7.5571	432.584360		0	0	0	0.0789827	1	45	0%	0	0	0%	
Phosphorus	A	mg/kg-dr	6.5021	372.193933		0	0	0	0.3152895	22.896845	360	0%	0	0	0%	D
Potassium	A	mg/kg-dr	22.765	1303.11667		0	0	0	2.8701195	57.242111	900	0%	0	0	0%	D
Sodium	A	mg/kg-dr	5.207	298.059674		0	0	0	2.1099442	34.345267	450	0%	0	0	0%	D
Strontium	A	mg/kg-dr	1.7872	102.303102		0	0	0	0.0077323	1	18	0%	0	0	0%	
Antimony	B	mg/kg-dr	-0.0004	0		0	0	0	0.59154	22.896845	225	0%	0	0	0%	D
Arsenic	B	mg/kg-dr	0.04041	2.31315372		0	0	0	1.1082073	22.896845	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.0020205	0.11565769		0	0	0	0.0554104	1.1448422	0	0%	0	0	0%	DJ
Boron	B	mg/kg-dr	0.05751	3.29199383		0	0	0	0.3071612	5.7242111	450	0%	0	0	0%	DJ
Chromium	B	mg/kg-dr	0.08166	4.67439082		0	0	0	0.1095271	5.7242111	225	0%	0	0	0%	DJ
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.004083	0.23371954		0	0	0	0.0054764	0.2862106	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg-dr	0.07509	4.29831015		0	0	0	0.0659200	4.5793689	450	0%	0	0	0%	DJ
Copper	B	mg/kg-dr	0.14334	8.20508426		0	0	0	0.1122976	5.7242111	225	0%	0	0	0%	D
Gold	B	mg/kg-dr	-0.05216	0		0	0	0	0.9139276	11.448422	90	0%	0	0	0%	D
Lead	B	mg/kg-dr	0.17807	10.1931028		0	0	0	0.9794125	22.896845	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0089035	0.50965514		0	0	0	0.0489706	1.1448422	0	0%	0	0	0%	DJ
Lithium	B	mg/kg-dr	0.20658	11.8250754		0	0	0	0.0880498	5.7242111	22.5	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685557	B18020068-018	6010.20-S	SAMP		2/6/2018 5:47:57	1	118169	2/5/2018 7:5	0	0	15.08

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lithium as Li2O	B	mg/kg-dr	0.8903598	50.9660749		0	0	0	0.3794947	24.671350	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg-dr	0.00734	0.4201571		0	0	0	0.1822589	3.4345267	225	0%	0	0	0%	DJ
Nickel	B	mg/kg-dr	0.12088	6.91942643		0	0	0	0.1325727	3.4345267	225	0%	0	0	0%	D
Selenium	B	mg/kg-dr	0.00406	0		0	0	0	1.3085547	34.345267	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.000203	0		0	0	0	0.0654277	1.7172633	0	0%	0	0	0%	D
Silica	B	mg/kg-dr	9.20561936	526.949089		0	0	0	4.4670608	73.471395	100000	0%	0	0	0%	D
Silicon	B	mg/kg-dr	4.3033	246.329978		0	0	0	2.0881922	34.345267	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg-dr	9.20561936	526.949089		0	0	0	4.4670608	73.471395	100000	0%	0	0	0%	D
Silver	B	mg/kg-dr	-0.00286	0		0	0	0	0.3792862	5.7242111	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L-dry	-0.000143	0		0	0	0	0.0189643	0.2862106	0	0%	0	0	0%	D
Tellurium	B	mg/kg-dr	0.02615	1.49688121		0	0	0	0.6573684	22.896845	90	0%	0	0	0%	DJ
Thallium	B	mg/kg-dr	-0.01928	0		0	0	0	1.0247483	22.896845	225	0%	0	0	0%	D
Tin	B	mg/kg-dr	0.02907	1.66402818		0	0	0	0.6422565	11.448422	225	0%	0	0	0%	DJ
Titanium	B	mg/kg-dr	1.3103	75.0043386		0	0	0	0.0424965	2.2896845	225	0%	0	0	0%	D
Titanium as TiO2	B	mg/kg-dr	2.188201	125.257246		0	0	0	0.0709692	3.8237730	100000	0%	0	0	0%	D
Uranium	B	mg/kg-dr	-0.07061	0		0	0	0	2.6812205	57.242111	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g-dry	-0.047803	0		0	0	0	1.8151863	38.752909	3	0%	0	0	0%	D
Vanadium	B	mg/kg-dr	0.25733	14.7301125		0	0	0	0.2938810	5.7242111	225	0%	0	0	0%	D
Zinc	B	mg/kg-dr	0.57043	32.6526176		0	0	0	0.3655481	2.2896845	90	0%	0	0	0%	D
Aluminum as Al2O3	C	mg/kg-dr	251.1432	14375.9670		0	0	0	1.2811574	21.637518	100000	0%	0	0	0%	D
Barium as BaO	C	mg/kg-dr	1.35016	77.2860092		0	0	0	0.0438520	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		3.45004745		0	0	0	0.0019576	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.000115	0.00658284		0	0	0	0.0013601	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg-dr		54999.1091		0	0	0	19.377287	85.828822	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg-dr	538.272	30811.8258		0	0	0	10.855623	48.083374	100000	0%	0	0	0%	D
Iron as Fe2O3	C	mg/kg-dr	278.2065	15925.1275		0	0	0		16.371244	100000	0%	0	0	0%	D
Magnesium as MgCO3	C	mg/kg-dr		13878.8288		0	0	0	9.8955584	31.805732	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg-dr	115.89788	6634.23936		0	0	0	4.7301904	15.203505	100000	0%	0	0	0%	D
Manganese as MnO	C	mg/kg-dr	9.597517	549.382138		0	0	0	0.100308	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg-dr	14.889809	852.324106		0	0	0	0.7220131	52.433774	100000	0%	0	0	0%	D
Potassium as K2O	C	mg/kg-dr	27.318	1563.74000		0	0	0	3.4441434	68.690534	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg-dr	7.02945	402.380560		0	0	0	2.8484247	46.366110	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg-dr	2.108896	120.71766		0	0	0	0.0091241	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685558	MB-118184	ICP-6010-S-T	MBLK		2/6/2018 5:52:15	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.02328	1.164		0	0	0	0.5921	10	900	0%	0	0	0%	
Antimony	A	mg/kg	-0.00593	0		0	0	0	0.5167	20	225	0%	0	0	0%	
Arsenic	A	mg/kg	-0.00513	0		0	0	0	0.968	20	225	0%	0	0	0%	
Barium	A	mg/kg	0.00027	0		0	0	0	0.0342	1	18	0%	0	0	0%	
Beryllium	A	mg/kg	-0.00008	0		0	0	0	0.008364	1	22.5	0%	0	0	0%	
Boron	A	mg/kg	0.00209	0		0	0	0	0.2683	5	450	0%	0	0	0%	
Cadmium	A	mg/kg	0.00025	0		0	0	0	0.02376	1	90	0%	0	0	0%	
Calcium	A	mg/kg	0.12376	6.188		0	0	0	4.01	30	180	0%	0	0	0%	
Chromium	A	mg/kg	0.00047	0		0	0	0	0.09567	5	225	0%	0	0	0%	
Cobalt	A	mg/kg	0.00054	0		0	0	0	0.05758	4	450	0%	0	0	0%	
Copper	A	mg/kg	0.00165	0		0	0	0	0.09809	5	225	0%	0	0	0%	
Gold	A	mg/kg	0.00055	0		0	0	0	0.7983	10	90	0%	0	0	0%	
Iron	A	mg/kg	0.04281	0		0	0	0	2.162	10	360	0%	0	0	0%	
Lead	A	mg/kg	-0.00818	0		0	0	0	0.8555	20	900	0%	0	0	0%	
Lithium	A	mg/kg	-0.00037	0		0	0	0	0.07691	5	22.5	0%	0	0	0%	
Magnesium	A	mg/kg	0.01492	0.746		0	0	0	0.2216	8	180	0%	0	0	0%	
Manganese	A	mg/kg	0.00168	0.084		0	0	0	0.06899	1	45	0%	0	0	0%	
Molybdenum	A	mg/kg	-0.00071	0		0	0	0	0.1592	3	225	0%	0	0	0%	
Nickel	A	mg/kg	-0.00011	0		0	0	0	0.1158	3	225	0%	0	0	0%	
Phosphorus	A	mg/kg	0.02321	1.1605		0	0	0	0.2754	20	360	0%	0	0	0%	
Potassium	A	mg/kg	0.02845	0		0	0	0	2.507	50	900	0%	0	0	0%	
Selenium	A	mg/kg	0.00434	0		0	0	0	1.143	30	225	0%	0	0	0%	
Silicon	A	mg/kg	0.00751	0		0	0	0	1.824	30	450	0%	0	0	0%	
Silver	A	mg/kg	-0.00068	0		0	0	0	0.3313	5	2	0%	0	0	0%	
Sodium	A	mg/kg	0.1351	6.755		0	0	0	1.843	30	450	0%	0	0	0%	
Strontium	A	mg/kg	0.00041	0.0205		0	0	0	0.006754	1	18	0%	0	0	0%	
Tellurium	A	mg/kg	0.01417	0.7085		0	0	0	0.5742	20	90	0%	0	0	0%	
Thallium	A	mg/kg	-0.00412	0		0	0	0	0.8951	20	225	0%	0	0	0%	
Tin	A	mg/kg	0.02158	1.079		0	0	0	0.561	10	225	0%	0	0	0%	
Titanium	A	mg/kg	-0.00013	0		0	0	0	0.03712	2	225	0%	0	0	0%	
Uranium	A	mg/kg	-0.0223	0		0	0	0	2.342	50	900	0%	0	0	0%	
Vanadium	A	mg/kg	0.00015	0		0	0	0	0.2567	5	225	0%	0	0	0%	
Zinc	A	mg/kg	0.00411	0		0	0	0	0.3193	2	90	0%	0	0	0%	
Silica	C	mg/kg	0.0160714	0		0	0	0	3.90336	64.2	0	0%	0	0	0%	
Silicon as SiO2	C	mg/kg	0.0160714	0		0	0	0	3.90336	64.2	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685559	SRM-118184	ICP-6010-S-T	SRM		2/6/2018 5:56:09	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	176.29	8324.4138		8780	0	0	0.5591792	9.444	900	95%	11	189	0%	
Antimony	A	mg/kg	0.403	19.02966		48	0	0	0.4879715	18.888	225	40%	0	238	0%	
Arsenic	A	mg/kg	2.5665	121.19013		123	0	0	0.9141792	18.888	225	99%	87	112	0%	
Barium	A	mg/kg	4.7483	224.214726		253	0	0	0.0322985	1	18	89%	65	134	0%	
Beryllium	A	mg/kg	3.9391	186.004302		192	0	0	0.007899	1	22.5	97%	82	118	0%	
Boron	A	mg/kg	2.6005	122.79561		139	0	0	0.2533825	4.722	450	88%	78	122	0%	
Cadmium	A	mg/kg	4.423	208.85406		224	0	0	0.0224389	1	90	93%	87	112	0%	
Calcium	A	mg/kg	59.969	2831.73618		3090	0	0	3.787044	28.332	180	92%	85	115	0%	
Chromium	A	mg/kg	3.5294	166.658268		179	0	0	0.0903507	4.722	225	93%	86	114	0%	
Cobalt	A	mg/kg	1.1349	53.589978		60.1	0	0	0.0543786	3.7776	450	89%	84	116	0%	
Copper	A	mg/kg	1.4644	69.148968		78.9	0	0	0.0926362	4.722	225	88%	84	116	0%	
Gold	A	mg/kg	-0.04086	0		0	0	0	0.7539145	9.444	90	0%	0	0	0%	
Iron	A	mg/kg	89.302	4216.84044		4280	0	0	2.0417928	9.444	360	99%	72	128	0%	
Lead	A	mg/kg	2.9412	138.883464		145	0	0	0.8079342	18.888	900	96%	80	120	0%	
Lithium	A	mg/kg	1.9627	92.678694		94.8	0	0	0.0726338	4.722	22.5	98%	74	126	0%	
Magnesium	A	mg/kg	37.824	1786.04928		3470	0	0	2.3506116	7.5552	4500	51%	10	191	0%	
Manganese	A	mg/kg	6.2408	294.690576		335	0	0	0.0651542	1	45	88%	62	138	0%	
Molybdenum	A	mg/kg	1.1608	54.812976		57.8	0	0	0.1503485	2.8332	225	95%	80	120	0%	
Nickel	A	mg/kg	2.6126	123.366972		143	0	0	0.1093615	2.8332	225	86%	84	112	0%	
Phosphorus	A	mg/kg	8.136	384.18192		415	0	0	0.2600878	18.888	360	93%	70	130	0%	
Potassium	A	mg/kg	59.329	2801.51538		3080	0	0	2.3676108	47.22	900	91%	80	120	0%	
Selenium	A	mg/kg	0.83095	39.237459		42.4	0	0	1.0794492	28.332	225	93%	79	121	0%	
Silicon	A	mg/kg	4.263	201.29886		1110	0	0	1.7225856	28.332	450	18%	0	228	0%	
Silver	A	mg/kg	1.5981	75.462282		81.6	0	0	0.3128797	4.722	2	92%	83	117	0%	
Sodium	A	mg/kg	98.32	4642.6704		4580	0	0	1.7405292	28.332	450	101%	85	115	0%	
Strontium	A	mg/kg	6.5213	307.935786		359	0	0	0.0063785	1	18	86%	65	135	0%	
Tellurium	A	mg/kg	0.03559	1.6805598		0	0	0	0.5422745	18.888	90	0%	0	0	0%	
Thallium	A	mg/kg	1.0105	47.71581		52	0	0	0.8453324	18.888	225	92%	78	122	0%	
Tin	A	mg/kg	2.5108	118.559976		123	0	0	0.5298084	9.444	225	96%	78	122	0%	
Titanium	A	mg/kg	2.342	110.58924		119	0	0	0.0350561	1.8888	225	93%	14	187	0%	
Uranium	A	mg/kg	-0.01396	0		0	0	0	2.2117848	47.22	900	0%	0	0	0%	
Vanadium	A	mg/kg	1.4904	70.376688		72.3	0	0	0.2424275	4.722	225	97%	81	119	0%	
Zinc	A	mg/kg	15.182	716.89404		770	0	0	0.3015469	1.8888	90	93%	83	117	0%	
Silica	C	mg/kg	9.12282	430.779560		0	0	0	3.6863332	60.63048	0	0%	0	0	0%	
Silicon as SiO2	C	mg/kg	9.12282	430.779560		0	0	0	3.6863332	60.63048	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685560	B18012116-001	6010.20-S	SAMP		2/6/2018 6:00:13	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/kg	0.118648	18.0700904		0	0	0	0.1041732	5	18	0%	0	0	0%	
Beryllium	A	mg/kg	0.00004	0		0	0	0	0.0254767	5	22.5	0%	0	0	0%	
Calcium	A	mg/kg	10.8826	1657.41998		0	0	0	20.630558	91.38	900	0%	0	0	0%	D
Chromium	A	mg/kg	141.802	21596.4446		0	0	0	0.2914108	15.23	225	0%	0	0	0%	D
Magnesium	A	mg/kg	3.4824	530.36952		0	0	0	7.581494	50	4500	0%	0	0	0%	
Potassium	A	mg/kg	2.8436	433.08028		0	0	0	7.636322	152.3	900	0%	0	0	0%	D
Sodium	A	mg/kg	38.82	5912.286		0	0	0	5.613778	91.38	450	0%	0	0	0%	D
Strontium	A	mg/kg	0.25692	39.128916		0	0	0	0.0205727	5	18	0%	0	0	0%	
Aluminum	B	mg/kg	4.1298	628.96854		0	0	0	1.8035366	30.46	900	0%	0	0	0%	D
Aluminum as Al2O3	B	mg/kg	7.805322	1188.75054		0	0	0	3.4086842	57.5694	100000	0%	0	0	0%	D
Antimony	B	mg/kg	0.80226	122.184198		0	0	0	1.5738682	60.92	225	0%	0	0	0%	D
Arsenic	B	mg/kg	0.04037	6.148351		0	0	0	2.948528	60.92	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L	0.0020185	0.30741755		0	0	0	0.1474264	3.046	0	0%	0	0	0%	DJ
Boron	B	mg/kg	0.135446	20.6284258		0	0	0	0.8172418	15.23	450	0%	0	0	0%	D
Cadmium	B	mg/kg	0.004236	0.6451428		0	0	0	0.072373	2.4368	90	0%	0	0	0%	DJ
Cadmium, TCLP equivalent (calc)	B	mg/L	0.0002118	0.03225714		0	0	0	0.0036186	0.12184	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg	0.003172	0.4830956		0	0	0	0.1753887	12.184	450	0%	0	0	0%	DJ
Copper	B	mg/kg	4.0752	620.65296		0	0	0	0.2987821	15.23	225	0%	0	0	0%	D
Gold	B	mg/kg	-0.005984	0		0	0	0	2.4316218	30.46	90	0%	0	0	0%	D
Lead	B	mg/kg	2.4464	372.58672		0	0	0	2.605853	60.92	900	0%	0	0	0%	D
Lithium	B	mg/kg	0.022372	3.4072556		0	0	0	0.2342679	15.23	22.5	0%	0	0	0%	DJ
Lithium as Li2O	B	mg/kg	0.09642332	14.6852716		0	0	0	1.0096945	65.6413	10000	0%	0	0	0%	DJ
Manganese	B	mg/kg	0.067596	10.2948708		0	0	0	0.2101435	5	45	0%	0	0	0%	
Manganese as MnO	B	mg/kg	0.08584692	13.0744859		0	0	0	0.2668823	6.35	100000	0%	0	0	0%	
Molybdenum	B	mg/kg	0.009264	1.4109072		0	0	0	0.4849232	9.138	225	0%	0	0	0%	DJ
Nickel	B	mg/kg	0.11178	17.024094		0	0	0	0.3527268	9.138	225	0%	0	0	0%	D
Phosphorus	B	mg/kg	0.097714	14.8818422		0	0	0	0.8388684	60.92	360	0%	0	0	0%	DJ
Phosphorus as P2O5	B	mg/kg	0.22376506	34.0794186		0	0	0	1.9210086	139.5068	100000	0%	0	0	0%	DJ
Selenium	B	mg/kg	0.001384	0		0	0	0	3.481578	91.38	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L	0.0000692	0		0	0	0	0.1740789	4.569	0	0%	0	0	0%	D
Silica	B	mg/kg	0.93247728	142.01629		0	0	0	11.88519	195.4801	100000	0%	0	0	0%	DJ
Silicon	B	mg/kg	0.4359	66.38757		0	0	0	5.555904	91.38	450	0%	0	0	0%	DJ
Silicon as SiO2	B	mg/kg	0.93247728	142.01629		0	0	0	11.88519	195.4801	100000	0%	0	0	0%	DJ
Silver	B	mg/kg	-0.002616	0		0	0	0	1.0091398	15.23	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L	-0.0001308	0		0	0	0	0.050457	0.7615	0	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685560	B18012116-001	6010.20-S	SAMP		2/6/2018 6:00:13	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tellurium	B	mg/kg	0.007292	0		0	0	0	1.7490132	60.92	90	0%	0	0	0%	D
Thallium	B	mg/kg	-0.004062	0		0	0	0	2.7264746	60.92	225	0%	0	0	0%	D
Tin	B	mg/kg	0.075064	11.4322472		0	0	0	1.708806	30.46	225	0%	0	0	0%	DJ
Titanium	B	mg/kg	0.027366	4.1678418		0	0	0	0.1130675	6.092	225	0%	0	0	0%	DJ
Titanium as TiO2	B	mg/kg	0.04570122	6.96029581		0	0	0	0.1888228	10.17364	100000	0%	0	0	0%	DJ
Uranium	B	mg/kg	0.018946	0		0	0	0	7.133732	152.3	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g	0.01282644	0		0	0	0	4.8295366	103.1071	3	0%	0	0	0%	D
Vanadium	B	mg/kg	0.05992	9.125816		0	0	0	0.7819082	15.23	225	0%	0	0	0%	DJ
Zinc	B	mg/kg	0.31654	48.209042		0	0	0	0.9725878	6.092	90	0%	0	0	0%	D
Barium as BaO	C	mg/kg	0.13288576	20.2385012		0	0	0	0.116674	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		0.9034467		0	0	0	0.0052083	0.249984	0	0%	0	0	0%	D
Calcium as CaCO3	C	mg/kg		4141.89253		0	0	0	51.555764	228.35862	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg	15.23564	2320.38797		0	0	0	28.882781	127.932	100000	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	C	mg/L	7.0901	1079.82223		0	0	0	0.0145705	0.7615	0	0%	0	0	0%	D*
Lead, TCLP equivalent (calc)	C	mg/L	0.12232	18.629336		0	0	0	0.1302927	3.046	0	0%	0	0	0%	D*
Magnesium as MgCO3	C	mg/kg		1841.82484		0	0	0	26.328406	173.636	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg	5.780784	880.413403		0	0	0	12.585280	83	100000	0%	0	0	0%	
Potassium as K2O	C	mg/kg	3.41232	519.696336		0	0	0	9.1635864	182.76	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg	52.407	7981.5861		0	0	0	7.5786003	123.363	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg	0.3031656	46.1721209		0	0	0	0.0242758	5.9	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685561	CCV	ICP-6010-W-D	CCV		2/6/2018 6:03:59	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5796	2.5796		2.5	0	0	0.0066084	0.1	18	103%	90	110	0%	
Antimony	A	mg/L	2.6505	2.6505		2.5	0	0	0.0356182	0.05	225	106%	90	110	0%	
Arsenic	A	mg/L	2.6718	2.6718		2.5	0	0	0.0231651	0.1	225	107%	90	110	0%	
Barium	A	mg/L	2.4244	2.4244		2.5	0	0	0.0003929	0.1	18	97%	90	110	0%	
Beryllium	A	mg/L	1.325	1.325		1.25	0	0	0.0002318	0.01	22.5	106%	90	110	0%	
Boron	A	mg/L	2.64	2.64		2.5	0	0	0.0080048	0.1	450	106%	90	110	0%	
Cadmium	A	mg/L	2.4984	2.4984		2.5	0	0	0.0010328	0.01	90	100%	90	110	0%	
Calcium	A	mg/L	25.949	25.949		25	0	0	0.1071422	1	180	104%	90	110	0%	
Chromium	A	mg/L	2.5556	2.5556		2.5	0	0	0.0010626	0.05	225	102%	90	110	0%	
Cobalt	A	mg/L	2.4655	2.4655		2.5	0	0	0.0033639	0.02	450	99%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685561	CCV	ICP-6010-W-D	CCV		2/6/2018 6:03:59	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	A	mg/L	2.4845	2.4845		2.5	0	0	0.0048764	0.01	225	99%	90	110	0%	
Gold	A	mg/L	2.4821	2.4821		2.5	0	0	0.0189485	0.1	90	99%	90	110	0%	
Iron	A	mg/L	2.7726	2.7726		2.5	0	0	0.0250321	0.0250321	360	111%	90	110	0%	S
Lead	A	mg/L	2.5563	2.5563		2.5	0	0	0.0187623	0.05	900	102%	90	110	0%	
Lithium	A	mg/L	1.3048	1.3048		1.25	0	0	0.0059040	0.1	22.5	104%	90	110	0%	
Magnesium	A	mg/L	25.525	25.525		25	0	0	0.0116555	1	180	102%	90	110	0%	
Manganese	A	mg/L	2.5226	2.5226		2.5	0	0	0.0010649	0.01	45	101%	90	110	0%	
Mercury	A	mg/L	1.017	1.017		1	0	0	0.0100947	0.02	45	102%	90	110	0%	
Molybdenum	A	mg/L	2.636	2.636		2.5	0	0	0.0031266	0.1	225	105%	90	110	0%	
Nickel	A	mg/L	2.4219	2.4219		2.5	0	0	0.0012530	0.05	225	97%	90	110	0%	
Phosphorus	A	mg/L	2.6823	2.6823		2.5	0	0	0.0425464	0.1	360	107%	90	110	0%	
Potassium	A	mg/L	25.917	25.917		25	0	0	0.0854754	1	900	104%	90	110	0%	
Selenium	A	mg/L	2.4647	2.4647		2.5	0	0	0.0234201	0.1	225	99%	90	110	0%	
Silicon	A	mg/L	5.2797	5.2797		5	0	0	0.0487685	0.1	450	106%	90	110	0%	
Silver	A	mg/L	0.99278	0.99278		1	0	0	0.0055813	0.01	2	99%	90	110	0%	
Sodium	A	mg/L	26.86	26.86		25	0	0	0.1131395	1	450	107%	90	110	0%	
Strontium	A	mg/L	2.4285	2.4285		2.5	0	0	0.0002417	0.1	18	97%	90	110	0%	
Tellurium	A	mg/L	2.507	2.507		2.5	0	0	0.0301968	0.1	90	100%	90	110	0%	
Thallium	A	mg/L	2.4702	2.4702		2.5	0	0	0.0116401	0.5	225	99%	90	110	0%	
Tin	A	mg/L	2.6434	2.6434		2.5	0	0	0.0081865	0.1	225	106%	90	110	0%	
Titanium	A	mg/L	2.623	2.623		2.5	0	0	0.002716	0.01	225	105%	90	110	0%	
Uranium	A	mg/L	2.4191	2.4191		2.5	0	0	0.1154022	0.1154022	900	97%	90	110	0%	
Vanadium	A	mg/L	2.6533	2.6533		2.5	0	0	0.0036660	0.1	225	106%	90	110	0%	
Zinc	A	mg/L	2.5634	2.5634		2.5	0	0	0.0023364	0.01	90	103%	90	110	0%	
Silica	C	mg/L	11.2943342	11.2943342		10.7	0	0	0.1043257	0.21392	100	106%	90	110	0%	
Silicon as SiO2	C	mg/L	11.298558	11.298558		10.7	0	0	0.1043647	0.214	0	106%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685562	CCB	ICP-6010-W-D	CCB		2/6/2018 6:07:41	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0006	0.0006		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.00469	-0.00469		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	-0.00318	-0.00318		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00038	0.00038		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685562	CCB	ICP-6010-W-D	CCB		2/6/2018 6:07:41	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/L	0.00016	0.00016		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00401	0.00401		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00034	0.00034		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00769	0.00769		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00052	0.00052		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00111	0.00111		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00067	0.00067		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00268	0.00268		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.00062	0.00062		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.0054	-0.0054		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00043	0.00043		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00429	0.00429		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00047	0.00047		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00072	0.00072		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00093	0.00093		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00011	-0.00011		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.00039	-0.00039		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	-0.01013	-0.01013		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.0036	0.0036		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	-0.00212	-0.00212		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00138	-0.00138		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0745	0.0745		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00047	0.00047		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01949	0.01949		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00199	0.00199		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	-0.00001	-0.00001		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	-0.00028	-0.00028		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.01439	-0.01439		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00122	0.00122		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00043	0.00043		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	-0.0045351	-0.0045351		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	-0.0045368	-0.0045368		0	0	0	0.1043647	0.214	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685563	B18020111-001	6010.20-S	SAMP		2/6/2018 6:11:35	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/kg	0.02992	2.9270736		0	0	0	0.0163650	5	22.5	0%	0	0	0%	J
Calcium	A	mg/kg	312.34	30556.2222		0	0	0	13.252052	58.698	900	0%	0	0	0%	D
Chromium	A	mg/kg	0.16569	16.2094527		0	0	0	0.1871879	5	225	0%	0	0	0%	
Magnesium	A	mg/kg	61.107	5978.09781		0	0	0	4.8699774	50	4500	0%	0	0	0%	
Manganese	A	mg/kg	2.046	200.16018		0	0	0	0.1349858	5	45	0%	0	0	0%	
Potassium	A	mg/kg	5.5639	544.316337		0	0	0	4.9051962	97.83	900	0%	0	0	0%	D
Sodium	A	mg/kg	12.61	1233.6363		0	0	0	3.6060138	58.698	450	0%	0	0	0%	D
Strontium	A	mg/kg	9.2682	906.708006		0	0	0	0.0132149	5	18	0%	0	0	0%	
Aluminum	B	mg/kg	154.74	15138.2142		0	0	0	1.1585029	19.566	900	0%	0	0	0%	D
Aluminum as Al2O3	B	mg/kg	292.4586	28611.2248		0	0	0	2.1895704	36.97974	100000	0%	0	0	0%	D
Antimony	B	mg/kg	0.00299	0		0	0	0	1.0109752	39.132	225	0%	0	0	0%	D
Arsenic	B	mg/kg	0.01324	0		0	0	0	1.8939888	39.132	225	0%	0	0	0%	D
Arsenic, TCLP equivalent (calc)	B	mg/L	0.000662	0		0	0	0	0.0946994	1.9566	0	0%	0	0	0%	D
Barium	B	mg/kg	7.0531	690.004773		0	0	0	0.0669157	5	18	0%	0	0	0%	
Boron	B	mg/kg	5.8061	568.010763		0	0	0	0.5249558	9.783	450	0%	0	0	0%	D
Cadmium	B	mg/kg	0.00037	0		0	0	0	0.0464888	1.56528	90	0%	0	0	0%	D
Cadmium, TCLP equivalent (calc)	B	mg/L	0.0000185	0		0	0	0	0.0023244	1.0759562	0	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	B	mg/L	0.0082845	0.81047264		0	0	0	0.0093594	0.48915	0	0%	0	0	0%	D
Cobalt	B	mg/kg	0.04093	4.0041819		0	0	0	0.1126610	7.8264	450	0%	0	0	0%	DJ
Copper	B	mg/kg	0.31689	31.0013487		0	0	0	0.1919229	9.783	225	0%	0	0	0%	D
Gold	B	mg/kg	-0.02001	0		0	0	0	1.5619538	19.566	90	0%	0	0	0%	D
Lead	B	mg/kg	0.06985	6.8334255		0	0	0	1.6738713	39.132	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L	0.0034925	0.34167128		0	0	0	0.0836936	1.9566	0	0%	0	0	0%	DJ
Lithium	B	mg/kg	0.1044	10.213452		0	0	0	0.1504821	9.783	22.5	0%	0	0	0%	D
Lithium as Li2O	B	mg/kg	0.449964	44.0199781		0	0	0	0.6485779	42.16473	10000	0%	0	0	0%	D
Molybdenum	B	mg/kg	0.00731	0.7151373		0	0	0	0.3114907	5.8698	225	0%	0	0	0%	DJ
Nickel	B	mg/kg	0.06832	6.6837456		0	0	0	0.2265743	5.8698	225	0%	0	0	0%	D
Phosphorus	B	mg/kg	0.38581	37.7437923		0	0	0	0.5388476	39.132	360	0%	0	0	0%	DJ
Phosphorus as P2O5	B	mg/kg	0.8835049	86.4332844		0	0	0	1.2339611	89.61228	100000	0%	0	0	0%	DJ
Selenium	B	mg/kg	0.06242	6.1065486		0	0	0	2.2363938	58.698	225	0%	0	0	0%	DJ
Selenium, TCLP equivalent (calc)	B	mg/L	0.003121	0.30532743		0	0	0	0.1118197	2.9349	0	0%	0	0	0%	DJ
Silica	B	mg/kg	11.2930507	1104.79915		0	0	0	7.6344591	125.56676	100000	0%	0	0	0%	D
Silicon	B	mg/kg	5.2791	516.454353		0	0	0	3.5688384	58.698	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg	11.2930507	1104.79915		0	0	0	7.6344591	125.56676	100000	0%	0	0	0%	D
Silver	B	mg/kg	-0.00028	0		0	0	0	0.6482216	9.783	2	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685563	B18020111-001	6010.20-S	SAMP		2/6/2018 6:11:35	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver, TCLP equivalent (calc)	B	mg/L	-0.000014	0		0	0	0	0.0324111	0.48915	0	0%	0	0	0%	D
Tellurium	B	mg/kg	0.04982	4.8738906		0	0	0	1.1234797	39.132	90	0%	0	0	0%	DJ
Thallium	B	mg/kg	-0.00888	0		0	0	0	1.7513527	39.132	225	0%	0	0	0%	D
Tin	B	mg/kg	0.01753	1.7149599		0	0	0	1.0976526	19.566	225	0%	0	0	0%	DJ
Titanium	B	mg/kg	14.622	1430.47026		0	0	0	0.072629	5	225	0%	0	0	0%	
Titanium as TiO2	B	mg/kg	24.41874	2388.88533		0	0	0	0.1212904	8.35	100000	0%	0	0	0%	
Uranium	B	mg/kg	-0.05153	0		0	0	0	4.5823572	97.83	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g	-0.0348858	0		0	0	0	3.1022558	66.23091	3	0%	0	0	0%	D
Vanadium	B	mg/kg	0.40097	39.2268951		0	0	0	0.5022592	9.783	225	0%	0	0	0%	D
Zinc	B	mg/kg	0.03238	3.1677354		0	0	0	0.6247424	5	90	0%	0	0	0%	J
Barium as BaO	C	mg/kg	7.899472	772.805346		0	0	0	0.0749456	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L	0.35263243	34.4980306		0	0	0	0.0033456	0.249984	0	0%	0	0	0%	
Calcium as CaCO3	C	mg/kg	780.53766	76359.9993		0	0	0	33.116877	146.68630	100000	0%	0	0	0%	D
Calcium as CaO	C	mg/kg	437.276	42778.7111		0	0	0	18.552873	82.1772	100000	0%	0	0	0%	D
Calcium as CaSO4	C	mg/kg	1061.53122	103849.599		0	0	0	45.038953	199.49337	0	0%	0	0	0%	D
Magnesium as Mg(OH)2	C	mg/kg	146.423176	14324.5793		0	0	0	11.669327	119.80884	100000	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg	212.207501	20760.2598		0	0	0	16.912068	173.636	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg	101.43762	9923.64236		0	0	0	8.0841625	83	100000	0%	0	0	0%	
Manganese as MnO	C	mg/kg	2.59842	254.203429		0	0	0	0.1714320	6.35	100000	0%	0	0	0%	
Potassium as K2O	C	mg/kg	6.67668	653.179604		0	0	0	5.8862354	117.396	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg	17.0235	1665.40901		0	0	0	4.8681186	79.2423	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg	10.936476	1069.91545		0	0	0	0.0155936	5.9	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685564	B18020111-002	6010.20-S	SAMP		2/6/2018 6:15:56	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/kg	0.02554	2.446732		0	0	0	0.0160254	5	22.5	0%	0	0	0%	J
Calcium	A	mg/kg	307.61	29469.038		0	0	0	12.977068	57.48	900	0%	0	0	0%	D
Chromium	A	mg/kg	0.09415	9.01957		0	0	0	0.1833037	5	225	0%	0	0	0%	
Magnesium	A	mg/kg	56.235	5387.313		0	0	0	4.768924	50	4500	0%	0	0	0%	
Manganese	A	mg/kg	1.8887	180.93746		0	0	0	0.1321848	5	45	0%	0	0	0%	
Potassium	A	mg/kg	2.2478	215.33924		0	0	0	4.803412	95.8	900	0%	0	0	0%	D
Sodium	A	mg/kg	11.27	1079.666		0	0	0	3.531188	57.48	450	0%	0	0	0%	D
Strontium	A	mg/kg	9.1069	872.44102		0	0	0	0.0129407	5	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685564	B18020111-002	6010.20-S	SAMP		2/6/2018 6:15:56	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	B	mg/kg	104.4	10001.52		0	0	0	1.1344636	19.16	900	0%	0	0	0%	D
Aluminum as Al2O3	B	mg/kg	197.316	18902.8728		0	0	0	2.1441362	36.2124	100000	0%	0	0	0%	D
Antimony	B	mg/kg	0.00336	0		0	0	0	0.9899972	38.32	225	0%	0	0	0%	D
Arsenic	B	mg/kg	0.02121	2.031918		0	0	0	1.854688	38.32	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L	0.0010605	0.1015959		0	0	0	0.0927344	1.916	0	0%	0	0	0%	DJ
Barium	B	mg/kg	7.5907	727.18906		0	0	0	0.0655272	5	18	0%	0	0	0%	
Boron	B	mg/kg	8.2494	790.29252		0	0	0	0.5140628	9.58	450	0%	0	0	0%	D
Cadmium	B	mg/kg	0.00045	0		0	0	0	0.0455242	1.5328	90	0%	0	0	0%	D
Cadmium, TCLP equivalent (calc)	B	mg/L	0.0000225	0		0	0	0	0.0022762	0.07664	0	0%	0	0	0%	D
Chromium, TCLP equivalent (calc)	B	mg/L	0.0047075	0.4509785		0	0	0	0.0091652	0.479	0	0%	0	0	0%	DJ
Cobalt	B	mg/kg	0.03735	3.57813		0	0	0	0.1103233	7.664	450	0%	0	0	0%	DJ
Copper	B	mg/kg	0.23901	22.897158		0	0	0	0.1879404	9.58	225	0%	0	0	0%	D
Gold	B	mg/kg	-0.02684	0		0	0	0	1.5295428	19.16	90	0%	0	0	0%	D
Lead	B	mg/kg	0.05476	5.246008		0	0	0	1.639138	38.32	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L	0.002738	0.2623004		0	0	0	0.0819569	1.916	0	0%	0	0	0%	DJ
Lithium	B	mg/kg	0.06494	6.221252		0	0	0	0.1473596	9.58	22.5	0%	0	0	0%	DJ
Lithium as Li2O	B	mg/kg	0.2798914	26.8135961		0	0	0	0.6351197	41.2898	10000	0%	0	0	0%	DJ
Molybdenum	B	mg/kg	0.00752	0.720416		0	0	0	0.3050272	5.748	225	0%	0	0	0%	DJ
Nickel	B	mg/kg	0.06672	6.391776		0	0	0	0.2218728	5.748	225	0%	0	0	0%	D
Phosphorus	B	mg/kg	0.42606	40.816548		0	0	0	0.5276664	38.32	360	0%	0	0	0%	D
Phosphorus as P2O5	B	mg/kg	0.9756774	93.4698949		0	0	0	1.2083561	87.7528	100000	0%	0	0	0%	D
Selenium	B	mg/kg	0.06368	6.100544		0	0	0	2.189988	57.48	225	0%	0	0	0%	DJ
Selenium, TCLP equivalent (calc)	B	mg/L	0.003184	0.3050272		0	0	0	0.1094994	2.874	0	0%	0	0	0%	DJ
Silica	B	mg/kg	12.2306621	1171.69743		0	0	0	7.4760419	122.96122	100000	0%	0	0	0%	D
Silicon	B	mg/kg	5.7174	547.72692		0	0	0	3.494784	57.48	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg	12.2306621	1171.69743		0	0	0	7.4760419	122.96122	100000	0%	0	0	0%	D
Silver	B	mg/kg	0.00016	0		0	0	0	0.6347708	9.58	2	0%	0	0	0%	D
Silver, TCLP equivalent (calc)	B	mg/L	0.000008	0		0	0	0	0.0317385	0.479	0	0%	0	0	0%	D
Tellurium	B	mg/kg	0.03785	3.62603		0	0	0	1.1001672	38.32	90	0%	0	0	0%	DJ
Thallium	B	mg/kg	-0.01121	0		0	0	0	1.7150116	38.32	225	0%	0	0	0%	D
Tin	B	mg/kg	0.01989	1.905462		0	0	0	1.074876	19.16	225	0%	0	0	0%	DJ
Titanium	B	mg/kg	9.8198	940.73684		0	0	0	0.0711219	5	225	0%	0	0	0%	
Titanium as TiO2	B	mg/kg	16.399066	1571.03052		0	0	0	0.1187736	8.35	100000	0%	0	0	0%	
Uranium	B	mg/kg	-0.08626	0		0	0	0	4.487272	95.8	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g	-0.0583980	0		0	0	0	3.0378831	64.8566	3	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685564	B18020111-002	6010.20-S	SAMP		2/6/2018 6:15:56	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	B	mg/kg	0.28334	27.143972		0	0	0	0.4918372	9.58	225	0%	0	0	0%	D
Zinc	B	mg/kg	0.01491	1.428378		0	0	0	0.6117788	5	90	0%	0	0	0%	J
Barium as BaO	C	mg/kg	8.501584	814.451747		0	0	0	0.0733905	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L	0.37951071	36.357126		0	0	0	0.0032762	0.249984	0	0%	0	0	0%	
Calcium as CaCO3	C	mg/kg	768.71739	73643.126		0	0	0	32.429693	143.64252	100000	0%	0	0	0%	D
Calcium as CaO	C	mg/kg	430.654	41256.6532		0	0	0	18.167895	80.472	100000	0%	0	0	0%	D
Calcium as CaSO4	C	mg/kg		100154.651		0	0	0	44.104382	195.35383	0	0%	0	0	0%	
Magnesium as Mg(OH)2	C	mg/kg		12908.9544		0	0	0	11.427185	119.80884	100000	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg	195.288409	18708.6296		0	0	0	16.561138	173.636	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg	93.3501	8942.93958		0	0	0	7.9164138	83	100000	0%	0	0	0%	
Manganese as MnO	C	mg/kg	2.398649	229.790574		0	0	0	0.1678747	6.35	100000	0%	0	0	0%	
Potassium as K2O	C	mg/kg	2.69736	258.407088		0	0	0	5.7640944	114.96	100000	0%	0	0	0%	D
Sodium as Na2O	C	mg/kg	15.2145	1457.5491		0	0	0	4.7671038	77.598	100000	0%	0	0	0%	D
Strontium as SrO	C	mg/kg	10.746142	1029.48040		0	0	0	0.01527	5.9	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685565	B18020223-001	6010.20-S	SAMP		2/6/2018 6:20:08	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/kg	0.02338	1.158479		0	0	0	0.0082887	5	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg	0.00717	0.3552735		0	0	0	0.0235462	1	90	0%	0	0	0%	J
Calcium	A	mg/kg	107.46	5324.643		0	0	0	6.712043	50	900	0%	0	0	0%	
Chromium	A	mg/kg	0.20867	10.3395985		0	0	0	0.094809	5	225	0%	0	0	0%	
Magnesium	A	mg/kg	116.71	5782.9805		0	0	0	2.466599	50	4500	0%	0	0	0%	
Manganese	A	mg/kg	11.405	565.11775		0	0	0	0.0683691	5	45	0%	0	0	0%	
Potassium	A	mg/kg	102.75	5091.2625		0	0	0	2.484437	50	900	0%	0	0	0%	
Silver	A	mg/kg	0.00224	0		0	0	0	0.3283183	5	2	0%	0	0	0%	
Sodium	A	mg/kg	13.46	666.943		0	0	0	1.826413	50	450	0%	0	0	0%	
Strontium	A	mg/kg	1.1566	57.30953		0	0	0	0.0066932	5	18	0%	0	0	0%	
Aluminum	B	mg/kg	447.57	22177.0935		0	0	0	0.5867711	9.91	900	0%	0	0	0%	D
Aluminum as Al2O3	B	mg/kg	845.9073	41914.7067		0	0	0	1.1089974	18.7299	100000	0%	0	0	0%	D
Antimony	B	mg/kg	0.0192	0.95136		0	0	0	0.5120497	19.82	225	0%	0	0	0%	DJ
Arsenic	B	mg/kg	0.1032	5.11356		0	0	0	0.959288	19.82	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L	0.00516	0.255678		0	0	0	0.0479644	0.991	0	0%	0	0	0%	DJ
Barium	B	mg/kg	5.4912	272.08896		0	0	0	0.0338922	5	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685565	B18020223-001	6010.20-S	SAMP		2/6/2018 6:20:08	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	B	mg/kg	0.27367	13.5603485		0	0	0	0.2658853	5	450	0%	0	0	0%	
Cobalt	B	mg/kg	0.15557	7.7084935		0	0	0	0.0570618	5	450	0%	0	0	0%	
Copper	B	mg/kg	0.49245	24.4008975		0	0	0	0.0972072	5	225	0%	0	0	0%	
Gold	B	mg/kg	-0.09695	0		0	0	0	0.7911153	9.91	90	0%	0	0	0%	D
Lead	B	mg/kg	0.27843	13.7962065		0	0	0	0.8478005	19.82	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L	0.0139215	0.68981033		0	0	0	0.0423900	0.991	0	0%	0	0	0%	DJ
Lithium	B	mg/kg	0.45649	22.6190795		0	0	0	0.0762178	5	22.5	0%	0	0	0%	
Lithium as Li2O	B	mg/kg	1.9674719	97.4882326		0	0	0	0.3284988	21.55	10000	0%	0	0	0%	
Molybdenum	B	mg/kg	0.01149	0.5693295		0	0	0	0.1577672	5	225	0%	0	0	0%	J
Nickel	B	mg/kg	0.27623	13.6871965		0	0	0	0.1147578	5	225	0%	0	0	0%	
Phosphorus	B	mg/kg	10.533	521.91015		0	0	0	0.2729214	19.82	360	0%	0	0	0%	D
Phosphorus as P2O5	B	mg/kg	24.12057	1195.17424		0	0	0	0.6249900	45.3878	100000	0%	0	0	0%	D
Selenium	B	mg/kg	-0.02024	0		0	0	0	1.132713	29.73	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L	-0.001012	0		0	0	0	0.0566357	1.4865	0	0%	0	0	0%	D
Silica	B	mg/kg	11.8214331	585.752011		0	0	0	3.8667837	63.598416	100000	0%	0	0	0%	D
Silicon	B	mg/kg	5.5261	273.818255		0	0	0	1.807584	29.73	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg	11.8214331	585.752011		0	0	0	3.8667837	63.598416	100000	0%	0	0	0%	D
Tellurium	B	mg/kg	0.06266	3.104803		0	0	0	0.5690322	19.82	90	0%	0	0	0%	DJ
Thallium	B	mg/kg	-0.02664	0		0	0	0	0.8870441	19.82	225	0%	0	0	0%	D
Tin	B	mg/kg	0.03009	1.4909595		0	0	0	0.555951	9.91	225	0%	0	0	0%	DJ
Titanium	B	mg/kg	11.197	554.81135		0	0	0	0.0367859	5	225	0%	0	0	0%	
Titanium as TiO2	B	mg/kg	18.69899	926.534955		0	0	0	0.0614325	8.35	100000	0%	0	0	0%	
Uranium	B	mg/kg	-0.0092	0		0	0	0	2.320922	49.55	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g	-0.0062284	0		0	0	0	1.5712642	33.54535	3	0%	0	0	0%	D
Vanadium	B	mg/kg	0.62802	31.118391		0	0	0	0.2543897	4.955	225	0%	0	0	0%	D
Zinc	B	mg/kg	1.2862	63.73121		0	0	0	0.3164263	5	90	0%	0	0	0%	
Barium as BaO	C	mg/kg	6.150144	304.739635		0	0	0	0.0379593	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		13.6035773		0	0	0	0.0016945	0.249984	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.0003585	0.01776368		0	0	0	0.0011773	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg		13306.2829		0	0	0	16.773395	124.95	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg	150.444	7454.5002		0	0	0	9.3968602	70	100000	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.0104335	0.51697993		0	0	0	0.0047404	0.25	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg		20082.6720		0	0	0	8.5658077	173.636	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg	193.7386	9599.74763		0	0	0	4.0945543	83	100000	0%	0	0	0%	
Manganese as MnO	C	mg/kg	14.48435	717.699543		0	0	0	0.0868287	6.35	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685565	B18020223-001	6010.20-S	SAMP		2/6/2018 6:20:08	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium as K2O	C	mg/kg	123.3	6109.515		0	0	0	2.9813244	60	100000	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.000112	0		0	0	0	0.0164159	0.25	0	0%	0	0	0%	
Sodium as Na2O	C	mg/kg	18.171	900.37305		0	0	0	2.4656576	67.5	100000	0%	0	0	0%	
Strontium as SrO	C	mg/kg	1.364788	67.6252454		0	0	0	0.007898	5.9	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685566	B18020223-002	6010.20-S	SAMP		2/6/2018 6:24:24	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/kg	0.02229	1.0768299		0	0	0	0.0080813	5	22.5	0%	0	0	0%	J
Cadmium	A	mg/kg	0.00701	0.3386531		0	0	0	0.0229569	1	90	0%	0	0	0%	J
Calcium	A	mg/kg	86.7	4188.477		0	0	0	6.5440726	50	900	0%	0	0	0%	
Chromium	A	mg/kg	0.20802	10.0494462		0	0	0	0.0924364	5	225	0%	0	0	0%	
Magnesium	A	mg/kg	105.97	5119.4107		0	0	0	2.4048718	50	4500	0%	0	0	0%	
Manganese	A	mg/kg	11.548	557.88388		0	0	0	0.0666581	5	45	0%	0	0	0%	
Potassium	A	mg/kg	91.009	4396.64479		0	0	0	2.4222634	50	900	0%	0	0	0%	
Silver	A	mg/kg	0.00137	0		0	0	0	0.3201021	5	2	0%	0	0	0%	
Sodium	A	mg/kg	29.61	1430.4591		0	0	0	1.7807066	50	450	0%	0	0	0%	
Strontium	A	mg/kg	1.2	57.972		0	0	0	0.0065257	5	18	0%	0	0	0%	
Aluminum	B	mg/kg	401.49	19395.9819		0	0	0	0.5720870	9.662	900	0%	0	0	0%	D
Aluminum as Al2O3	B	mg/kg	758.8161	36658.4058		0	0	0	1.0812445	18.26118	100000	0%	0	0	0%	D
Antimony	B	mg/kg	0.0149	0.719819		0	0	0	0.4992355	19.324	225	0%	0	0	0%	DJ
Arsenic	B	mg/kg	0.09553	4.6150543		0	0	0	0.9352816	19.324	225	0%	0	0	0%	DJ
Arsenic, TCLP equivalent (calc)	B	mg/L	0.0047765	0.23075272		0	0	0	0.0467641	0.9662	0	0%	0	0	0%	DJ
Barium	B	mg/kg	3.9546	191.046726		0	0	0	0.0330440	5	18	0%	0	0	0%	
Boron	B	mg/kg	0.26985	13.0364535		0	0	0	0.2592315	5	450	0%	0	0	0%	
Cobalt	B	mg/kg	0.16596	8.0175276		0	0	0	0.0556338	5	450	0%	0	0	0%	
Copper	B	mg/kg	0.43444	20.9877964		0	0	0	0.0947746	5	225	0%	0	0	0%	
Gold	B	mg/kg	-0.09698	0		0	0	0	0.7713175	9.662	90	0%	0	0	0%	D
Lead	B	mg/kg	0.26055	12.5871705		0	0	0	0.8265841	19.324	900	0%	0	0	0%	DJ
Lead, TCLP equivalent (calc)	B	mg/L	0.0130275	0.62935853		0	0	0	0.0413292	0.9662	0	0%	0	0	0%	DJ
Lithium	B	mg/kg	0.41182	19.8950242		0	0	0	0.0743104	5	22.5	0%	0	0	0%	
Lithium as Li2O	B	mg/kg	1.7749442	85.7475543		0	0	0	0.3202780	21.55	10000	0%	0	0	0%	
Molybdenum	B	mg/kg	0.01095	0.5289945		0	0	0	0.1538190	5	225	0%	0	0	0%	J
Nickel	B	mg/kg	0.25907	12.5156717		0	0	0	0.111886	5	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685566	B18020223-002	6010.20-S	SAMP		2/6/2018 6:24:24	1	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Phosphorus	B	mg/kg	11.12	537.2072		0	0	0	0.2660915	19.324	360	0%	0	0	0%	D
Phosphorus as P2O5	B	mg/kg	25.4648	1230.20449		0	0	0	0.6093495	44.25196	100000	0%	0	0	0%	D
Selenium	B	mg/kg	-0.02803	0		0	0	0	1.1043666	28.986	225	0%	0	0	0%	D
Selenium, TCLP equivalent (calc)	B	mg/L	-0.0014015	0		0	0	0	0.0552183	1.4493	0	0%	0	0	0%	D
Silica	B	mg/kg	46.3543248	2239.37743		0	0	0	3.7700166	62.006851	100000	0%	0	0	0%	D
Silicon	B	mg/kg	21.669	1046.82939		0	0	0	1.7623488	28.986	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/kg	46.3543248	2239.37743		0	0	0	3.7700166	62.006851	100000	0%	0	0	0%	D
Tellurium	B	mg/kg	0.06977	3.3705887		0	0	0	0.5547920	19.324	90	0%	0	0	0%	DJ
Thallium	B	mg/kg	-0.02778	0		0	0	0	0.8648456	19.324	225	0%	0	0	0%	D
Tin	B	mg/kg	0.03137	1.5154847		0	0	0	0.5420382	9.662	225	0%	0	0	0%	DJ
Titanium	B	mg/kg	13.336	644.26216		0	0	0	0.0358653	5	225	0%	0	0	0%	
Titanium as TiO2	B	mg/kg	22.27112	1075.91781		0	0	0	0.0598951	8.35	100000	0%	0	0	0%	
Uranium	B	mg/kg	-0.01454	0		0	0	0	2.2628404	48.31	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/g	-0.0098436	0		0	0	0	1.531943	32.70587	3	0%	0	0	0%	D
Vanadium	B	mg/kg	0.67763	32.7363053		0	0	0	0.2480235	4.831	225	0%	0	0	0%	D
Zinc	B	mg/kg	1.1822	57.112082		0	0	0	0.3085077	5	90	0%	0	0	0%	
Barium as BaO	C	mg/kg	4.429152	213.972333		0	0	0	0.0370093	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		9.55172495		0	0	0	0.0016521	0.249984	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.0003505	0.01693266		0	0	0	0.0011478	0.05	0	0%	0	0	0%	J
Calcium as CaCO3	C	mg/kg		10467.0040		0	0	0	16.353637	124.95	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg	121.38	5863.8678		0	0	0	9.1617016	70	100000	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.010401	0.50247231		0	0	0	0.0046218	0.25	0	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg		17778.2799		0	0	0	8.3514464	173.636	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg	175.9102	8498.22176		0	0	0	3.9920872	83	100000	0%	0	0	0%	
Manganese as MnO	C	mg/kg	14.66596	708.512528		0	0	0	0.0846558	6.35	100000	0%	0	0	0%	
Potassium as K2O	C	mg/kg	109.2108	5275.97375		0	0	0	2.9067161	60	100000	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.0000685	0		0	0	0	0.0160051	0.25	0	0%	0	0	0%	
Sodium as Na2O	C	mg/kg	39.9735	1931.11979		0	0	0	2.4039539	67.5	100000	0%	0	0	0%	
Strontium as SrO	C	mg/kg	1.416	68.40696		0	0	0	0.0077003	5.9	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685567	B18020223-002	6010.20-S	SD		2/6/2018 6:28:42	5	118184	2/5/2018 8:0	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685567	B18020223-002	6010.20-S	SD		2/6/2018 6:28:42	5	118184	2/5/2018 8:0	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	86.588	20915.3314		0	0	19395.982	2.8604351	48.31	900	0%			8%	
Antimony	A	mg/kg	-0.00253	0		0	0	0.719819	2.4961777	96.62	225	0%				
Arsenic	A	mg/kg	0.019868	4.7991154		0	0	4.6150543	4.676408	96.62	225	0%				N
Barium	A	mg/kg	0.87068	210.312754		0	0	191.04673	0.1652202	2.4155	18	0%			10%	
Beryllium	A	mg/kg	0.004784	1.1555752		0	0	1.0768299	0.0404065	1	22.5	0%			7%	
Boron	A	mg/kg	0.06106	14.749043		0	0	13.036454	1.2961573	24.155	450	0%				
Cadmium	A	mg/kg	0.001264	0.3053192		0	0	0.3386531	0.1147846	3.8648	90	0%				N
Calcium	A	mg/kg	19.3496	4673.89588		0	0	4188.477	32.720363	144.93	900	0%			11%	R
Chromium	A	mg/kg	0.046074	11.1291747		0	0	10.049446	0.4621818	24.155	225	0%				
Cobalt	A	mg/kg	0.037552	9.0706856		0	0	8.0175276	0.278169	19.324	450	0%				
Copper	A	mg/kg	0.094982	22.9429021		0	0	20.987796	0.4738728	24.155	225	0%				
Gold	A	mg/kg	-0.022818	0		0	0	0	3.8565873	48.31	90	0%				
Iron	A	mg/kg	102.8	24831.34		0	0	20185.367	10.444622	48.31	360	0%			21%	R
Lead	A	mg/kg	0.08245	19.9157975		0	0	12.587171	4.1329205	96.62	900	0%				N
Lithium	A	mg/kg	0.089266	21.5622023		0	0	19.895024	0.3715522	24.155	22.5	0%				
Magnesium	A	mg/kg	22.66	5473.523		0	0	5119.4107	12.024359	38.648	4500	0%			7%	
Manganese	A	mg/kg	2.5858	624.59999		0	0	557.88388	0.3332907	2.4155	45	0%			11%	R
Molybdenum	A	mg/kg	0.002014	0		0	0	0.5289945	0.7690952	14.493	225	0%				
Nickel	A	mg/kg	0.05911	14.2780205		0	0	12.515672	0.5594298	14.493	225	0%				
Phosphorus	A	mg/kg	2.4266	586.14523		0	0	537.2072	1.3304574	96.62	360	0%			9%	
Potassium	A	mg/kg	19.8592	4796.98976		0	0	4396.6448	12.111317	241.55	900	0%			9%	
Selenium	A	mg/kg	0.002118	0		0	0	0	5.521833	144.93	225	0%				
Silicon	A	mg/kg	5.0162	1211.66311		0	0	1046.8294	8.811744	144.93	450	0%			15%	R
Silver	A	mg/kg	-0.000868	0		0	0	0	1.6005103	24.155	2	0%				
Sodium	A	mg/kg	6.504	1571.0412		0	0	1430.4591	8.903533	144.93	450	0%			9%	
Strontium	A	mg/kg	0.26286	63.493833		0	0	57.972	0.0326286	1	18	0%			9%	
Tellurium	A	mg/kg	0.025348	6.1228094		0	0	3.3705887	2.7739602	96.62	90	0%				N
Thallium	A	mg/kg	-0.004456	0		0	0	0	4.3242281	96.62	225	0%				
Tin	A	mg/kg	0.00697	0		0	0	1.5154847	2.710191	48.31	225	0%				
Titanium	A	mg/kg	2.9388	709.86714		0	0	644.26216	0.1793267	9.662	225	0%			10%	
Uranium	A	mg/kg	-0.052484	0		0	0	0	11.314202	241.55	900	0%				
Vanadium	A	mg/kg	0.148738	35.9276639		0	0	32.736305	1.2401177	24.155	225	0%			9%	
Zinc	A	mg/kg	0.2613	63.117015		0	0	57.112082	1.5425383	9.662	90	0%			10%	
Aluminum as Al2O3	C	mg/kg	163.65132	39529.9763		0	0	36658.406	5.4062223	91.3059	100000	0%			8%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.0009934	0.23995577		0	0	0.2307527	0.2338204	4.831	0	0%				N

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685567	B18020223-002	6010.20-S	SD		2/6/2018 6:28:42	5	118184	2/5/2018 8:0	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium as BaO	C	mg/kg	0.9751616	235.550284		0	0	213.97233	0.1850466	2.70536	100000	0%			10%	
Barium, TCLP equivalent (calc)	C	mg/L		10.5149647		0	0	9.551725	0.0082605	0.1207673	0	0%			10%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.0000632	0.01526596		0	0	0.0169327	0.0057392	0.19324	0	0%				N
Calcium as CaCO3	C	mg/kg		11680.0658		0	0	10467.004	81.768187	362.18007	100000	0%			11%	
Calcium as CaO	C	mg/kg	27.08944	6543.45423		0	0	5863.8678	45.808508	202.902	100000	0%			11%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.0023037	0.55645874		0	0	0.5024723	0.0231091	1.20775	0	0%				
Iron as Fe2O3	C	mg/kg	147.004	35508.8162		0	0	0	14.935809	69.0833	100000	0%				N
Iron as Fe3O4	C	mg/kg		49073.184		0	0	0	20.641289	95.473121	0	0%				N
Lead, TCLP equivalent (calc)	C	mg/L	0.0041225	0.99578988		0	0	0.6293585	0.2066460	4.831	0	0%				N
Lithium as Li2O	C	mg/kg	0.38473646	92.9330919		0	0	85.747554	1.6013900	104.10805	10000	0%				
Magnesium as MgCO3	C	mg/kg		19008.0128		0	0	17778.28	41.757232	134.21368	100000	0%			7%	
Magnesium as MgO	C	mg/kg	37.6156	9086.04818		0	0	8498.2218	19.960436	64.15568	100000	0%			7%	
Manganese as MnO	C	mg/kg	3.283966	793.241987		0	0	708.51253	0.4232792	3.067685	100000	0%			11%	
Phosphorus as P2O5	C	mg/kg	5.556914	1342.27258		0	0	1230.2045	3.0467474	221.2598	100000	0%			9%	
Potassium as K2O	C	mg/kg	23.83104	5756.38771		0	0	5275.9737	14.533580	289.86	100000	0%			9%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.0001059	0		0	0	0	0.2760917	7.2465	0	0%				
Silica	C	mg/kg	10.7306550	2591.98972		0	0	2239.3774	18.850083	310.03426	100000	0%			15%	R
Silicon as SiO2	C	mg/kg	10.7306550	2591.98972		0	0	2239.3774	18.850083	310.03426	100000	0%			15%	R
Silver, TCLP equivalent (calc)	C	mg/L	-0.0000434	0		0	0	0	0.0800255	1.20775	0	0%				
Sodium as Na2O	C	mg/kg	8.7804	2120.90562		0	0	1931.1198	12.01977	195.6555	100000	0%			9%	
Strontium as SrO	C	mg/kg	0.3101748	74.9227229		0	0	68.40696	0.0385017	1.18	100000	0%			9%	
Titanium as TiO2	C	mg/kg	4.907796	1185.47812		0	0	1075.9178	0.2994756	16.13554	100000	0%			10%	
Uranium, Activity	C	pCi/g	-0.0355317	0		0	0	0	7.6597148	163.52935	3	0%				

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685568	B18020223-002	6010.20-S	PDS		2/6/2018 6:32:24	1.03	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	395.368932	19673.2813		248.7965	19395.982	0	0.5892496	9.95186	900		75	125	0%	A
Antimony	A	mg/kg	0.9723301	48.382465		49.7593	0.719819	0	0.5142126	19.90372	225	96%	75	125	0%	
Arsenic	A	mg/kg	1.06116505	52.80283		49.7593	4.6150543	0	0.9633400	19.90372	225	97%	75	125	0%	
Barium	A	mg/kg	4.71116505	234.424275		49.7593	191.04673	0	0.0340354	1	18	87%	75	125	0%	
Beryllium	A	mg/kg	0.50232039	24.9951109		24.87965	1.0768299	0	0.0083237	1	22.5	96%	75	125	0%	
Boron	A	mg/kg	1.23019417	61.213601		49.7593	13.036454	0	0.2670084	4.97593	450	97%	75	125	0%	
Cadmium	A	mg/kg	0.45396117	22.5887898		24.87965	0.3386531	0	0.0236456	1	90	89%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685568	B18020223-002	6010.20-S	PDS		2/6/2018 6:32:24	1.03	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	mg/kg	130.087379	6473.0569		2487.965	4188.477	0	6.7403948	29.85558	900	92%	75	125	0%	
Chromium	A	mg/kg	1.09757282	54.614455		49.7593	10.049446	0	0.0952094	4.97593	225	90%	75	125	0%	
Cobalt	A	mg/kg	1.00776699	50.14578		49.7593	8.0175276	0	0.0573028	3.980744	450	85%	75	125	0%	
Copper	A	mg/kg	1.31970874	65.667783		49.7593	20.987796	0	0.0976178	4.97593	225	90%	75	125	0%	
Gold	A	mg/kg	0.76709709	38.1702141		49.7593	0	0	0.794457	9.95186	90	77%	75	125	0%	
Iron	A	mg/kg	409.009709	20352.0368		248.7965	20185.367	0	2.1515921	9.95186	360		75	125	0%	A
Lead	A	mg/kg	1.14213592	56.831884		49.7593	12.587171	0	0.8513816	19.90372	900	89%	75	125	0%	
Lithium	A	mg/kg	1.37932039	68.634017		49.7593	19.895024	0	0.0765398	4.97593	22.5	98%	75	125	0%	
Magnesium	A	mg/kg	148.844660	7406.4061		2487.965	5119.4107	0	2.477018	7.961488	4500	92%	75	125	0%	
Manganese	A	mg/kg	15.5504854	773.78127		248.7965	557.88388	0	0.0686579	1	45	87%	75	125	0%	
Molybdenum	A	mg/kg	0.93875728	46.7119052		49.7593	0.5289945	0	0.1584336	2.985558	225	93%	75	125	0%	
Nickel	A	mg/kg	1.0638835	52.938098		49.7593	12.515672	0	0.1152425	2.985558	225	81%	75	125	0%	
Phosphorus	A	mg/kg	20.5203883	1021.08016		497.593	537.2072	0	0.2740742	19.90372	360	97%	75	125	0%	
Potassium	A	mg/kg	135.699029	6752.2887		2487.965	4396.6448	0	2.4949313	49.7593	900	95%	75	125	0%	
Selenium	A	mg/kg	0.88017476	43.7968798		49.7593	0	0	1.1374976	29.85558	225	88%	75	125	0%	
Silicon	A	mg/kg	28.6679612	1426.49768		497.593	1046.8294	0	1.8152193	29.85558	450	76%	75	125	0%	
Silver	A	mg/kg	0.42579612	21.1873167		24.87965	0	0	0.3297051	4.97593	2	85%	75	125	0%	
Sodium	A	mg/kg	79.5145631	3956.589		2487.965	1430.4591	0	1.8341278	29.85558	450	102%	75	125	0%	
Strontium	A	mg/kg	2.05184466	102.098354		49.7593	57.972	0	0.0067215	1	18	89%	75	125	0%	
Tellurium	A	mg/kg	0.95245631	47.3935593		49.7593	3.3705887	0	0.5714358	19.90372	90	88%	75	125	0%	
Thallium	A	mg/kg	0.81589320	40.5982747		49.7593	0	0	0.890791	19.90372	225	82%	75	125	0%	
Tin	A	mg/kg	0.94853398	47.1983869		49.7593	1.5154847	0	0.5582993	9.95186	225	92%	75	125	0%	
Titanium	A	mg/kg	13.8834951	690.833		49.7593	644.26216	0	0.0369413	1.990372	225		75	125	0%	A
Uranium	A	mg/kg	0.89766019	44.6669429		0	0	0	2.3307256	49.7593	900	0%	75	125	0%	
Vanadium	A	mg/kg	1.60757282	79.991698		49.7593	32.736305	0	0.2554642	4.97593	225	95%	75	125	0%	
Zinc	A	mg/kg	2.04553398	101.784339		49.7593	57.112082	0	0.3177629	1.990372	90	90%	75	125	0%	
Aluminum as Al2O3	C	mg/kg	747.247282	37182.5017		0	36658.406	0	1.1136818	18.809015	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.05305825	2.6401415		0	0.2307527	0	0.0481670	0.995186	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	5.27650485	262.555188		0	213.97233	0	0.0381196	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		11.7204636		0	9.551725	0	0.0017017	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.02269806	1.12943949		0	0.0169327	0	0.0011823	0.05	0	0%	0	0	0%	
Calcium as CaCO3	C	mg/kg		16176.1692		0	10467.004	0	16.844247	74.609094	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg	182.122330	9062.27966		0	5863.8678	0	9.4365527	41.797812	100000	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.05487864	2.73072275		0	0.5024723	0	0.0047605	0.2487965	0	0%	0	0	0%	
Iron as Fe2O3	C	mg/kg	584.883883	29103.4126		0	0	0	3.0767767	14.23116	100000	0%	0	0	0%	

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11685568	B18020223-002	6010.20-S	PDS		2/6/2018 6:32:24	1.03	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron as Fe3O4	C	mg/kg		40220.9162		0	0	0	4.2521055	19.667463	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.0571068	2.8415942		0	0.6293585	0	0.0425691	0.995186	0	0%	0	0	0%	
Lithium as Li2O	C	mg/kg	5.94487087	295.812613		0	85.747554	0	0.3298863	21.446258	10000	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg		25720.3746		0	17778.28	0	8.6019898	27.648019	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg	247.082136	12294.6341		0	8498.2218	0	4.1118498	13.216070	100000	0%	0	0	0%	
Manganese as MnO	C	mg/kg	19.7491165	982.702213		0	708.51253	0	0.0871955	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg	46.9916893	2338.27357		0	1230.2045	0	0.62763	45.579519	100000	0%	0	0	0%	
Potassium as K2O	C	mg/kg	162.838835	8102.74644		0	5275.9737	0	2.9939176	59.71116	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.04400874	2.18984399		0	0	0	0.0568749	1.492779	0	0%	0	0	0%	
Silica	C	mg/kg	61.3265025	3051.56384		1064.8490	2239.3774	0	3.8831170	63.867057	100000	76%	75	125	0%	
Silicon as SiO2	C	mg/kg	61.3265025	3051.56384		1064.8490	2239.3774	0	3.8831170	63.867057	100000	76%	75	125	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.02128981	1.05936584		0	0	0	0.0164853	0.2487965	0	0%	0	0	0%	
Sodium as Na2O	C	mg/kg	107.344660	5341.39515		0	1931.1198	0	2.4760725	40.305033	100000	0%	0	0	0%	
Strontium as SrO	C	mg/kg	2.4211767	120.476058		0	68.40696	0	0.0079314	1.18	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	23.1854369	1153.69111		0	1075.9178	0	0.061692	3.3239212	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g	0.60771595	30.2395203		0	0	0	1.5779012	33.687046	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685569	B18020223-002	6010.20-S	MS3		2/6/2018 6:36:49	1	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	387.72	19133.982		246.75	19395.982	0	0.5844027	9.87	900		75	125	0%	A
Antimony	A	mg/kg	0.20166	9.951921		49.35	0.719819	0	0.5099829	19.74	225	19%	75	125	0%	S
Arsenic	A	mg/kg	0.86281	42.5796735		49.35	4.6150543	0	0.955416	19.74	225	77%	75	125	0%	
Barium	A	mg/kg	3.809	187.97415		49.35	191.04673	0	0.0337554	1	18	-6%	75	125	0%	S
Beryllium	A	mg/kg	0.40187	19.8322845		24.675	1.0768299	0	0.0082553	1	22.5	76%	75	125	0%	
Boron	A	mg/kg	1.0068	49.68558		49.35	13.036454	0	0.2648121	4.935	450	74%	75	125	0%	S
Cadmium	A	mg/kg	0.36614	18.069009		24.675	0.3386531	0	0.0234511	1	90	72%	75	125	0%	S
Calcium	A	mg/kg	105.39	5200.9965		2467.5	4188.477	0	6.684951	29.61	900	41%	75	125	0%	S
Chromium	A	mg/kg	0.89599	44.2171065		49.35	10.049446	0	0.0944263	4.935	225	69%	75	125	0%	S
Cobalt	A	mg/kg	0.79214	39.092109		49.35	8.0175276	0	0.0568315	3.948	450	63%	75	125	0%	S
Copper	A	mg/kg	1.0639	52.503465		49.35	20.987796	0	0.0968148	4.935	225	64%	75	125	0%	S
Gold	A	mg/kg	0.63593	31.3831455		49.35	0	0	0.7879221	9.87	90	64%	75	125	0%	S
Iron	A	mg/kg	339.69	16763.7015		246.75	20185.367	0	2.133894	9.87	360		75	125	0%	A
Lead	A	mg/kg	0.92232	45.516492		49.35	12.587171	0	0.8443785	19.74	900	67%	75	125	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685569	B18020223-002	6010.20-S	MS3		2/6/2018 6:36:49	1	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lithium	A	mg/kg	1.1491	56.708085		49.35	19.895024	0	0.0759102	4.935	22.5	75%	75	125	0%	
Magnesium	A	mg/kg	122.05	6023.1675		2467.5	5119.4107	0	2.456643	7.896	4500	37%	75	125	0%	S
Manganese	A	mg/kg	12.036	593.9766		246.75	557.88388	0	0.0680931	1	45	15%	75	125	0%	S
Molybdenum	A	mg/kg	0.64606	31.883061		49.35	0.5289945	0	0.1571304	2.961	225	64%	75	125	0%	S
Nickel	A	mg/kg	0.8585	42.366975		49.35	12.515672	0	0.1142946	2.961	225	60%	75	125	0%	S
Phosphorus	A	mg/kg	14.964	738.4734		493.5	537.2072	0	0.2718198	19.74	360	41%	75	125	0%	S
Potassium	A	mg/kg	113.18	5585.433		2467.5	4396.6448	0	2.474409	49.35	900	48%	75	125	0%	S
Selenium	A	mg/kg	0.6661	32.872035		49.35	0	0	1.128141	29.61	225	67%	75	125	0%	S
Silicon	A	mg/kg	5.6048	276.59688		493.5	1046.8294	0	1.800288	29.61	450	-156%	75	125	0%	S
Silver	A	mg/kg	0.35008	17.276448		24.675	0	0	0.3269931	4.935	2	70%	75	125	0%	S
Sodium	A	mg/kg	63.68	3142.608		2467.5	1430.4591	0	1.819041	29.61	450	69%	75	125	0%	S
Strontium	A	mg/kg	1.7005	83.919675		49.35	57.972	0	0.0066662	1	18	53%	75	125	0%	S
Tellurium	A	mg/kg	0.76445	37.7256075		49.35	3.3705887	0	0.5667354	19.74	90	70%	75	125	0%	S
Thallium	A	mg/kg	0.66916	33.023046		49.35	0	0	0.8834637	19.74	225	67%	75	125	0%	S
Tin	A	mg/kg	0.70188	34.637778		49.35	1.5154847	0	0.553707	9.87	225	67%	75	125	0%	S
Titanium	A	mg/kg	14.689	724.90215		49.35	644.26216	0	0.0366374	1.974	225		75	125	0%	A
Uranium	A	mg/kg	0.81671	40.3046385		49.35	0	0	2.311554	49.35	900	82%	75	125	0%	
Vanadium	A	mg/kg	1.3031	64.307985		49.35	32.736305	0	0.2533629	4.935	225	64%	75	125	0%	S
Zinc	A	mg/kg	1.7129	84.531615		49.35	57.112082	0	0.3151491	1.974	90	56%	75	125	0%	S
Aluminum as Al2O3	C	mg/kg	732.7908	36163.226		0	36658.406	0	1.1045211	18.6543	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.0431405	2.12898368		0	0.2307527	0	0.0477708	0.987	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	4.26608	210.531048		0	213.97233	0	0.0378060	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		9.39810598		0	9.551725	0	0.0016877	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.018307	0.90345045		0	0.0169327	0	0.0011726	0.05	0	0%	0	0	0%	
Calcium as CaCO3	C	mg/kg		12997.2903		0	10467.004	0	16.705693	73.99539	100000	0%	0	0	0%	
Calcium as CaO	C	mg/kg	147.546	7281.3951		0	5863.8678	0	9.3589314	41.454	100000	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.0447995	2.21085533		0	0.5024723	0	0.0047213	0.24675	0	0%	0	0	0%	
Iron as Fe2O3	C	mg/kg	485.7567	23972.0931		0	0	0	3.0514684	14.1141	100000	0%	0	0	0%	
Iron as Fe3O4	C	mg/kg		33129.4327		0	0	0	4.2171294	19.505686	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.046116	2.2758246		0	0.6293585	0	0.0422189	0.987	0	0%	0	0	0%	
Lithium as Li2O	C	mg/kg	4.952621	244.411846		0	85.747554	0	0.3271728	21.26985	10000	0%	0	0	0%	
Magnesium as MgCO3	C	mg/kg		20916.7742		0	17778.28	0	8.5312333	27.420597	100000	0%	0	0	0%	
Magnesium as MgO	C	mg/kg	202.603	9998.45805		0	8498.2218	0	4.0780274	13.10736	100000	0%	0	0	0%	
Manganese as MnO	C	mg/kg	15.28572	754.350282		0	708.51253	0	0.0864783	1.27	100000	0%	0	0	0%	
Phosphorus as P2O5	C	mg/kg	34.26756	1691.10409		0	1230.2045	0	0.6224673	45.2046	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685569	B18020223-002	6010.20-S	MS3		2/6/2018 6:36:49	1	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium as K2O	C	mg/kg	135.816	6702.5196		0	5275.9737	0	2.9692908	59.22	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.033305	1.64360175		0	0	0	0.0564071	1.4805	0	0%	0	0	0%	
Silica	C	mg/kg	11.9897882	591.696046		211.218	2239.3774	0	3.8511761	63.341712	100000		75	125	0%	A
Silicon as SiO2	C	mg/kg	11.9897882	591.696046		211.218	2239.3774	0	3.8511761	63.341712	100000		75	125	0%	A
Silver, TCLP equivalent (calc)	C	mg/L	0.017504	0.8638224		0	0	0	0.0163497	0.24675	0	0%	0	0	0%	
Sodium as Na2O	C	mg/kg	85.968	4242.5208		0	1931.1198	0	2.4557054	39.9735	100000	0%	0	0	0%	
Strontium as SrO	C	mg/kg	2.00659	99.0252165		0	68.40696	0	0.0078661	1.18	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	24.53063	1210.58659		0	1075.9178	0	0.0611845	3.29658	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g	0.55291267	27.2862403		0	0	0	1.5649221	33.40995	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685570	B18020223-002	6010.20-S	MSD3		2/6/2018 6:41:03	1	118184	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	495.23	24652.5494		248.875	19395.982	19133.982	0.5894948	9.956	900		75	125	25%	AR
Antimony	A	mg/kg	0.24614	12.2528492		49.775	0.719819	9.951921	0.5144265	19.912	225	23%	75	125		S
Arsenic	A	mg/kg	1.0488	52.209264		49.775	4.6150543	42.579674	0.9637408	19.912	225	96%	75	125	20%	R
Barium	A	mg/kg	4.8143	239.655854		49.775	191.04673	187.97415	0.0340495	1	18	98%	75	125	24%	R
Beryllium	A	mg/kg	0.49912	24.8461936		24.8875	1.0768299	19.832285	0.0083272	1	22.5	96%	75	125	22%	R
Boron	A	mg/kg	1.244	61.92632		49.775	13.036454	49.68558	0.2671195	4.978	450	98%	75	125	22%	R
Cadmium	A	mg/kg	0.45047	22.4243966		24.8875	0.3386531	18.069009	0.0236555	1	90	89%	75	125	22%	R
Calcium	A	mg/kg	131.39	6540.5942		2488.75	4188.477	5200.9965	6.7431988	29.868	900	95%	75	125	23%	R
Chromium	A	mg/kg	1.1146	55.484788		49.775	10.049446	44.217107	0.0952491	4.978	225	91%	75	125	23%	R
Cobalt	A	mg/kg	0.9894	49.252332		49.775	8.0175276	39.092109	0.0573266	3.9824	450	83%	75	125	23%	R
Copper	A	mg/kg	1.3263	66.023214		49.775	20.987796	52.503465	0.0976584	4.978	225	90%	75	125	23%	R
Gold	A	mg/kg	0.78863	39.2580014		49.775	0	31.383146	0.7947875	9.956	90	79%	75	125	22%	R
Iron	A	mg/kg	413.96	20606.9288		248.875	20185.367	16763.702	2.1524872	9.956	360		75	125	21%	AR
Lead	A	mg/kg	1.1168	55.594304		49.775	12.587171	45.516492	0.8517358	19.912	900	86%	75	125	20%	
Lithium	A	mg/kg	1.4153	70.453634		49.775	19.895024	56.708085	0.0765716	4.978	22.5	102%	75	125	22%	R
Magnesium	A	mg/kg	154.95	7713.411		2488.75	5119.4107	6023.1675	2.4780484	7.9648	4500	104%	75	125	25%	R
Manganese	A	mg/kg	15.593	776.21954		248.875	557.88388	593.9766	0.0686864	1	45	88%	75	125	27%	R
Molybdenum	A	mg/kg	0.79819	39.7338982		49.775	0.5289945	31.883061	0.1584995	2.9868	225	79%	75	125	22%	R
Nickel	A	mg/kg	1.0683	53.179974		49.775	12.515672	42.366975	0.1152905	2.9868	225	82%	75	125	23%	R
Phosphorus	A	mg/kg	18.168	904.40304		497.75	537.2072	738.4734	0.2741882	19.912	360	74%	75	125	20%	SR
Potassium	A	mg/kg	142.73	7105.0994		2488.75	4396.6448	5585.433	2.4959692	49.78	900	109%	75	125	24%	R

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685570	B18020223-002	6010.20-S	MSD3		2/6/2018 6:41:03	1	118184	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/kg	0.81492	40.5667176		49.775	0	32.872035	1.1379708	29.868	225	82%	75	125	21%	R
Silicon	A	mg/kg	8.2455	410.46099		497.75	1046.8294	276.59688	1.8159744	29.868	450	-128%	75	125	39%	SR
Silver	A	mg/kg	0.41421	20.6193738		24.8875	0	17.276448	0.3298423	4.978	2	83%	75	125	18%	
Sodium	A	mg/kg	78.65	3915.197		2488.75	1430.4591	3142.608	1.8348908	29.868	450	100%	75	125	22%	R
Strontium	A	mg/kg	2.1229	105.677962		49.775	57.972	83.919675	0.0067243	1	18	96%	75	125	23%	R
Tellurium	A	mg/kg	0.93979	46.7827462		49.775	3.3705887	37.725608	0.5716735	19.912	90	87%	75	125	21%	R
Thallium	A	mg/kg	0.80575	40.110235		49.775	0	33.023046	0.8911616	19.912	225	81%	75	125	19%	
Tin	A	mg/kg	0.87206	43.4111468		49.775	1.5154847	34.637778	0.5585316	9.956	225	84%	75	125	22%	R
Titanium	A	mg/kg	18.73	932.3794		49.775	644.26216	724.90215	0.0369567	1.9912	225		75	125	25%	AR
Uranium	A	mg/kg	0.99501	49.5315978		49.775	0	40.304639	2.3316952	49.78	900	100%	75	125		
Vanadium	A	mg/kg	1.6207	80.678446		49.775	32.736305	64.307985	0.2555705	4.978	225	96%	75	125	23%	R
Zinc	A	mg/kg	2.1126	105.165228		49.775	57.112082	84.531615	0.3178951	1.9912	90	97%	75	125	22%	R
Aluminum as Al2O3	C	mg/kg	935.9847	46593.3184		0	36658.406	36163.226	1.1141451	18.81684	100000	0%	0	0	25%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.05244	2.6104632		0	0.2307527	2.1289837	0.0481870	0.9956	0	0%	0	0	20%	
Barium as BaO	C	mg/kg	5.392016	268.414556		0	213.97233	210.53105	0.0381355	1.12	100000	0%	0	0	24%	
Barium, TCLP equivalent (calc)	C	mg/L		11.9820258		0	9.551725	9.398106	0.0017024	0.0499968	0	0%	0	0	24%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.0225235	1.12121983		0	0.0169327	0.9034505	0.0011828	0.05	0	0%	0	0	22%	
Calcium as CaCO3	C	mg/kg		16344.9449		0	10467.004	12997.290	16.851254	74.640132	100000	0%	0	0	23%	
Calcium as CaO	C	mg/kg	183.946	9156.83188		0	5863.8678	7281.3951	9.4404783	41.8152	100000	0%	0	0	23%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.05573	2.7742394		0	0.5024723	2.2108553	0.0047625	0.2489	0	0%	0	0	23%	
Iron as Fe2O3	C	mg/kg	591.9628	29467.9082		0	0	23972.093	3.0780567	14.23708	100000	0%	0	0	21%	
Iron as Fe3O4	C	mg/kg		40724.6491		0	0	33129.433	4.2538744	19.675645	0	0%	0	0	21%	
Lead, TCLP equivalent (calc)	C	mg/L	0.05584	2.7797152		0	0.6293585	2.2758246	0.0425868	0.9956	0	0%	0	0	20%	
Lithium as Li2O	C	mg/kg	6.099943	303.655163		0	85.747554	244.41185	0.3300236	21.45518	10000	0%	0	0	22%	
Magnesium as MgCO3	C	mg/kg		26786.5166		0	17778.28	20916.774	8.6055682	27.659520	100000	0%	0	0	25%	
Magnesium as MgO	C	mg/kg	257.217	12804.2623		0	8498.2218	9998.4581	4.1135603	13.221568	100000	0%	0	0	25%	
Manganese as MnO	C	mg/kg	19.80311	985.798816		0	708.51253	754.35028	0.0872318	1.27	100000	0%	0	0	27%	
Phosphorus as P2O5	C	mg/kg	41.60472	2071.08296		0	1230.2045	1691.1041	0.6278911	45.59848	100000	0%	0	0	20%	
Potassium as K2O	C	mg/kg	171.276	8526.11928		0	5275.9737	6702.5196	2.9951630	59.736	100000	0%	0	0	24%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.040746	2.02833588		0	0	1.6436018	0.0568985	1.4934	0	0%	0	0	21%	
Silica	C	mg/kg	17.6387736	878.05815		1065.185	2239.3774	591.69605	3.8847324	63.893626	100000	-128%	75	125	39%	SR
Silicon as SiO2	C	mg/kg	17.6387736	878.05815		1065.185	2239.3774	591.69605	3.8847324	63.893626	100000	-128%	75	125	39%	SR
Silver, TCLP equivalent (calc)	C	mg/L	0.0207105	1.03096869		0	0	0.8638224	0.0164921	0.2489	0	0%	0	0	18%	
Sodium as Na2O	C	mg/kg	106.1775	5285.51595		0	1931.1198	4242.5208	2.4771026	40.3218	100000	0%	0	0	22%	
Strontium as SrO	C	mg/kg	2.505022	124.699995		0	68.40696	99.025217	0.0079347	1.18	100000	0%	0	0	23%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685570	B18020223-002	6010.20-S	MSD3		2/6/2018 6:41:03	1	118184	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Titanium as TiO2	C	mg/kg	31.2791	1557.0736		0	1075.9178	1210.5866	0.0617176	3.325304	100000	0%	75	0	25%	
Uranium, Activity	C	pCi/g	0.67362177	33.5328917		0	0	27.286240	1.5785577	33.70106	3	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685571	MB-118185	ICP-200.7-W-T	MBLK		2/6/2018 6:45:28	1	118185	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.02723	0		0	0	0	0.046874	0.1	18	0%	0	0	0%	
Antimony	A	mg/L	-0.00481	0		0	0	0	0.0243446	0.1	225	0%	0	0	0%	
Arsenic	A	mg/L	-0.00158	0		0	0	0	0.0152331	0.1	225	0%	0	0	0%	
Barium	A	mg/L	0.00032	0		0	0	0	0.0120570	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00003	0		0	0	0	0.0032233	0.01	22.5	0%	0	0	0%	
Boron	A	mg/L	0.0115	0		0	0	0	0.0115945	0.1	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00045	0		0	0	0	0.0019732	0.01	90	0%	0	0	0%	
Calcium	A	mg/L	0.07132	0		0	0	0	0.2573074	1	180	0%	0	0	0%	
Chromium	A	mg/L	-0.00013	0		0	0	0	0.0016388	0.05	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00117	0		0	0	0	0.0028057	0.05	450	0%	0	0	0%	
Copper	A	mg/L	-0.00031	0		0	0	0	0.0061828	0.01	225	0%	0	0	0%	
Gold	A	mg/L	0.00215	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	
Iron	A	mg/L	0.03476	0.03476		0	0	0	0.003702	0.02	360	0%	0	0	0%	
Lead	A	mg/L	-0.00526	0		0	0	0	0.0219671	0.05	900	0%	0	0	0%	
Lithium	A	mg/L	-0.00039	0		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.01218	0.01218		0	0	0	0.0087454	1	180	0%	0	0	0%	
Manganese	A	mg/L	0.00109	0.00109		0	0	0	0.0007721	0.01	45	0%	0	0	0%	
Molybdenum	A	mg/L	0.00029	0		0	0	0	0.0028813	0.1	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00097	0		0	0	0	0.0011228	0.01	225	0%	0	0	0%	
Phosphorus	A	mg/L	-0.00119	0		0	0	0	0.0185454	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	-0.00039	0		0	0	0	0.0677463	1	900	0%	0	0	0%	
Selenium	A	mg/L	0.01354	0		0	0	0	0.0256471	0.1	225	0%	0	0	0%	
Silicon	A	mg/L	0.03794	0.03794		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Silver	A	mg/L	-0.0002	0		0	0	0	0.1134097	0.1134097	2	0%	0	0	0%	
Sodium	A	mg/L	0.0726	0		0	0	0	0.1801052	1	450	0%	0	0	0%	
Strontium	A	mg/L	0.00028	0		0	0	0	0.0002998	0.1	18	0%	0	0	0%	
Tellurium	A	mg/L	0.01027	0		0	0	0	0.0274363	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00199	0		0	0	0	0.0085795	0.1	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685571	MB-118185	ICP-200.7-W-T	MBLK		2/6/2018 6:45:28	1	118185	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00233	0		0	0	0	0.0090899	0.1	225	0%	0	0	0%	
Titanium	A	mg/L	0.00135	0		0	0	0	0.0026007	0.1	225	0%	0	0	0%	
Uranium	A	mg/L	-0.00464	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00076	0		0	0	0	0.0042111	0.1	225	0%	0	0	0%	
Zinc	A	mg/L	0.00159	0		0	0	0	0.0025454	0.01	90	0%	0	0	0%	
Silica	C	mg/L	0.0811916	0.0811916		0	0	0	0.058823	0.214	210	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0811916	0.0811916		0	0	0	0.058823	0.214	210	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685572	LCS-118185	ICP-200.7-W-T	LCS		2/6/2018 6:49:23	1	118185	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5898	2.5898		2.5	0	0	0.046874	0.1	18	104%	85	115	0%	
Antimony	A	mg/L	0.53154	0.53154		0.5	0	0	0.0243446	0.1	225	106%	85	115	0%	
Arsenic	A	mg/L	0.58265	0.58265		0.5	0	0	0.0152331	0.1	225	117%	85	115	0%	S
Barium	A	mg/L	0.48347	0.48347		0.5	0	0	0.0120570	0.1	18	97%	85	115	0%	
Beryllium	A	mg/L	0.26183	0.26183		0.25	0	0	0.0032233	0.01	22.5	105%	85	115	0%	
Boron	A	mg/L	0.53352	0.53352		0.5	0	0	0.0115945	0.1	450	107%	85	115	0%	
Cadmium	A	mg/L	0.25065	0.25065		0.25	0	0	0.0019732	0.01	90	100%	85	115	0%	
Calcium	A	mg/L	25.882	25.882		25	0	0	0.2573074	1	180	104%	85	115	0%	
Chromium	A	mg/L	0.50726	0.50726		0.5	0	0	0.0016388	0.05	225	101%	85	115	0%	
Cobalt	A	mg/L	0.48861	0.48861		0.5	0	0	0.0028057	0.05	450	98%	85	115	0%	
Copper	A	mg/L	0.49532	0.49532		0.5	0	0	0.0061828	0.01	225	99%	85	115	0%	
Gold	A	mg/L	0.45794	0.45794		0.5	0	0	0.0150401	0.0150401	90	92%	85	115	0%	
Iron	A	mg/L	2.7891	2.7891		2.5	0.03476	0	0.003702	0.02	360	110%	85	115	0%	
Lead	A	mg/L	0.50612	0.50612		0.5	0	0	0.0219671	0.05	900	101%	85	115	0%	
Lithium	A	mg/L	0.52756	0.52756		0.5	0	0	0.0075881	0.1	22.5	106%	85	115	0%	
Magnesium	A	mg/L	25.276	25.276		25	0.01218	0	0.0284359	1	4500	101%	85	115	0%	
Manganese	A	mg/L	2.5346	2.5346		2.5	0.00109	0	0.0007721	0.01	45	101%	85	115	0%	
Molybdenum	A	mg/L	0.52353	0.52353		0.5	0	0	0.0028813	0.1	225	105%	85	115	0%	
Nickel	A	mg/L	0.47724	0.47724		0.5	0	0	0.0011228	0.01	225	95%	85	115	0%	
Phosphorus	A	mg/L	5.3747	5.3747		5	0	0	0.0185454	0.1	360	107%	85	115	0%	
Potassium	A	mg/L	26.177	26.177		25	0	0	0.0677463	1	900	105%	85	115	0%	
Selenium	A	mg/L	0.49717	0.49717		0.5	0	0	0.0256471	0.1	225	99%	85	115	0%	
Silicon	A	mg/L	5.2637	5.2637		5	0.03794	0	0.0274874	0.1	450	105%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685572	LCS-118185	ICP-200.7-W-T	LCS		2/6/2018 6:49:23	1	118185	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	0.03989	0		0.05	0	0	0.1134097	0.1134097	2	0%	85	115	0%	S
Sodium	A	mg/L	25.432	25.432		25	0	0	1.3372894	1.3372894	4500	102%	85	115	0%	
Strontium	A	mg/L	0.48942	0.48942		0.5	0	0	0.0002998	0.1	18	98%	85	115	0%	
Tellurium	A	mg/L	0.51765	0.51765		0.5	0	0	0.0274363	0.1	90	104%	85	115	0%	
Thallium	A	mg/L	0.49122	0.49122		0.5	0	0	0.0085795	0.1	225	98%	85	115	0%	
Tin	A	mg/L	0.53236	0.53236		0.5	0	0	0.0090899	0.1	225	106%	85	115	0%	
Titanium	A	mg/L	0.53038	0.53038		0.5	0	0	0.0026007	0.1	225	106%	85	115	0%	
Uranium	A	mg/L	0.53568	0.53568		0.5	0	0	0.1233518	0.1233518	900	107%	85	115	0%	
Vanadium	A	mg/L	0.5357	0.5357		0.5	0	0	0.0042111	0.1	225	107%	85	115	0%	
Zinc	A	mg/L	0.52169	0.52169		0.5	0	0	0.0025454	0.01	90	104%	85	115	0%	
Silica	C	mg/L	11.264318	11.264318		10.696	0.0811916	0	0.058823	0.214	210	105%	85	115	0%	
Silicon as SiO2	C	mg/L	11.264318	11.264318		10.696	0.0811916	0	0.058823	0.214	210	105%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685573	CCV	ICP-200.7-W-D	CCV		2/6/2018 6:52:58	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5899	2.5899		2.5	0	0	0.0066084	0.1	18	104%	90	110	0%	
Antimony	A	mg/L	2.682	2.682		2.5	0	0	0.0356182	0.05	225	107%	90	110	0%	
Arsenic	A	mg/L	2.6972	2.6972		2.5	0	0	0.0231651	0.1	225	108%	90	110	0%	
Barium	A	mg/L	2.4152	2.4152		2.5	0	0	0.0003929	0.1	18	97%	90	110	0%	
Beryllium	A	mg/L	1.3296	1.3296		1.25	0	0	0.0002318	0.01	22.5	106%	90	110	0%	
Boron	A	mg/L	2.6568	2.6568		2.5	0	0	0.0080048	0.1	450	106%	90	110	0%	
Cadmium	A	mg/L	2.4803	2.4803		2.5	0	0	0.0010328	0.01	90	99%	90	110	0%	
Calcium	A	mg/L	25.685	25.685		25	0	0	0.1071422	1	180	103%	90	110	0%	
Chromium	A	mg/L	2.5487	2.5487		2.5	0	0	0.0010626	0.05	225	102%	90	110	0%	
Cobalt	A	mg/L	2.4463	2.4463		2.5	0	0	0.0033639	0.02	450	98%	90	110	0%	
Copper	A	mg/L	2.4847	2.4847		2.5	0	0	0.0048764	0.01	225	99%	90	110	0%	
Gold	A	mg/L	2.4865	2.4865		2.5	0	0	0.0189485	0.1	90	99%	90	110	0%	
Iron	A	mg/L	2.7915	2.7915		2.5	0	0	0.0250321	0.0250321	360	112%	90	110	0%	S
Lead	A	mg/L	2.5545	2.5545		2.5	0	0	0.0187623	0.05	900	102%	90	110	0%	
Lithium	A	mg/L	1.3153	1.3153		1.25	0	0	0.0059040	0.1	22.5	105%	90	110	0%	
Magnesium	A	mg/L	25.38	25.38		25	0	0	0.0116555	1	180	102%	90	110	0%	
Manganese	A	mg/L	2.5208	2.5208		2.5	0	0	0.0010649	0.01	45	101%	90	110	0%	
Mercury	A	mg/L	1.0079	1.0079		1	0	0	0.0100947	0.02	45	101%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685573	CCV	ICP-200.7-W-D	CCV		2/6/2018 6:52:58	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	A	mg/L	2.6508	2.6508		2.5	0	0	0.0031266	0.1	225	106%	90	110	0%	
Nickel	A	mg/L	2.391	2.391		2.5	0	0	0.0012530	0.05	225	96%	90	110	0%	
Phosphorus	A	mg/L	2.7096	2.7096		2.5	0	0	0.0425464	0.1	360	108%	90	110	0%	
Potassium	A	mg/L	26.033	26.033		25	0	0	0.0854754	1	900	104%	90	110	0%	
Selenium	A	mg/L	2.4475	2.4475		2.5	0	0	0.0234201	0.1	225	98%	90	110	0%	
Silicon	A	mg/L	5.3139	5.3139		5	0	0	0.0487685	0.1	450	106%	90	110	0%	
Silver	A	mg/L	0.98171	0.98171		1	0	0	0.0055813	0.01	2	98%	90	110	0%	
Sodium	A	mg/L	27.19	27.19		25	0	0	0.1131395	1	450	109%	90	110	0%	
Strontium	A	mg/L	2.4448	2.4448		2.5	0	0	0.0002417	0.1	18	98%	90	110	0%	
Tellurium	A	mg/L	2.5033	2.5033		2.5	0	0	0.0301968	0.1	90	100%	90	110	0%	
Thallium	A	mg/L	2.4612	2.4612		2.5	0	0	0.0116401	0.5	225	98%	90	110	0%	
Tin	A	mg/L	2.6554	2.6554		2.5	0	0	0.0081865	0.1	225	106%	90	110	0%	
Titanium	A	mg/L	2.6368	2.6368		2.5	0	0	0.002716	0.01	225	105%	90	110	0%	
Uranium	A	mg/L	2.3913	2.3913		2.5	0	0	0.1154022	0.1154022	900	96%	90	110	0%	
Vanadium	A	mg/L	2.6622	2.6622		2.5	0	0	0.0036660	0.1	225	106%	90	110	0%	
Zinc	A	mg/L	2.5621	2.5621		2.5	0	0	0.0023364	0.01	90	102%	90	110	0%	
Silica	C	mg/L	11.3674949	11.3674949		10.7	0	0	0.1043257	0.21392	100	106%	90	110	0%	
Silicon as SiO2	C	mg/L	11.3674949	11.3674949		10.7	0	0	0.1043257	0.21392	0	106%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685574	CCB	ICP-200.7-W-D	CCB		2/6/2018 6:56:39	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00039	0.00039		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.00385	-0.00385		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	-0.00473	-0.00473		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.0005	0.0005		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00017	0.00017		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00431	0.00431		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00051	0.00051		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00836	0.00836		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00044	0.00044		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00073	0.00073		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00091	0.00091		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.01094	0.01094		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685574	CCB	ICP-200.7-W-D	CCB		2/6/2018 6:56:39	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	mg/L	-0.00051	-0.00051		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00539	-0.00539		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	-0.00047	-0.00047		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00555	0.00555		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00052	0.00052		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	-0.00018	-0.00018		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00085	0.00085		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0	0		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.00163	-0.00163		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.00159	0.00159		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00734	0.00734		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.01251	0.01251		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00105	-0.00105		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0751	0.0751		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00048	0.00048		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01499	0.01499		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.0032	0.0032		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	0.00252	0.00252		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	-0.00025	-0.00025		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.03478	-0.03478		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00086	0.00086		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00054	0.00054		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.02676139	0.02676139		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.02676139	0.02676139		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685575	B18020138-001	200.7.8-W-TR	SAMP		2/6/2018 7:00:34	1	118185	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.06982	0.13964		0	0	0	0.0231889	0.0231889	450	0%	0	0	0%	D
Iron	A	mg/L	0.27189	0.54378		0	0	0	0.2146782	0.2146782	1800	0%	0	0	0%	D
Phosphorus	A	mg/L	3.3848	6.7696		0	0	0	0.0370908	0.1	360	0%	0	0	0%	
Vanadium	A	mg/L	0.00095	0		0	0	0	0.0084221	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.06028	0.12056		0	0	0	0.0050909	0.008	90	0%	0	0	0%	
Aluminum	B	mg/L	0.14484	0.28968		0	0	0	0.093748	0.093748	18	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685575	B18020138-001	200.7.8-W-TR	SAMP		2/6/2018 7:00:34	1	118185	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/L	-0.00289	0		0	0	0	0.0486893	0.0486893	225	0%	0	0	0%	D
Barium	B	mg/L	0.12589	0.25178		0	0	0	0.0241141	0.05	18	0%	0	0	0%	
Beryllium	B	mg/L	-0.00005	0		0	0	0	0.0064467	0.0064467	22.5	0%	0	0	0%	D
Cadmium	B	mg/L	0.00045	0		0	0	0	0.0039465	0.0039465	90	0%	0	0	0%	D
Calcium	B	mg/L	26.467	52.934		0	0	0	0.5146149	1	180	0%	0	0	0%	
Calcium, meq	B	meq/L	1.3207033	2.6414066		0	0	0	0.0256793	0.0499	0	0%	0	0	0%	
Chromium	B	mg/L	0.0009	0		0	0	0	0.0032776	0.0032776	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.00038	0		0	0	0	0.0056113	0.0056113	450	0%	0	0	0%	D
Copper	B	mg/L	0.04086	0.08172		0	0	0	0.0123657	0.0123657	225	0%	0	0	0%	D
Gold	B	mg/L	0.00052	0		0	0	0	0.0300802	0.0300802	90	0%	0	0	0%	D
Lead	B	mg/L	0.00017	0		0	0	0	0.0439342	0.0439342	900	0%	0	0	0%	D
Lithium	B	mg/L	0.00684	0		0	0	0	0.0151762	0.1	22.5	0%	0	0	0%	
Magnesium	B	mg/L	7.9307	15.8614		0	0	0	0.0568718	1	4500	0%	0	0	0%	
Magnesium, meq	B	meq/L	0.65269661	1.30539322		0	0	0	0.0046805	0.0823	0	0%	0	0	0%	
Manganese	B	mg/L	0.01748	0.03496		0	0	0	0.0015443	0.0015443	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.00152	0		0	0	0	0.0057627	0.0057627	225	0%	0	0	0%	D
Nickel	B	mg/L	0.00063	0		0	0	0	0.0022456	0.0022456	225	0%	0	0	0%	D
Potassium	B	mg/L	7.8453	15.6906		0	0	0	0.1354927	1	900	0%	0	0	0%	
Potassium, meq	B	meq/L	0.20068277	0.40136555		0	0	0	0.0034659	0.02558	0	0%	0	0	0%	
Selenium	B	mg/L	0.00289	0		0	0	0	0.0512943	0.0512943	225	0%	0	0	0%	D
Silica	B	mg/L	8.15077984	16.3015597		0	0	0	0.117602	0.21392	1000	0%	0	0	0%	
Silicon	B	mg/L	3.8102	7.6204		0	0	0	0.0549747	0.1	450	0%	0	0	0%	
Silicon as SiO2	B	mg/L	8.15077984	16.3015597		0	0	0	0.117602	0.21392	1000	0%	0	0	0%	
Sodium	B	mg/L	42.048	84.096		0	0	0	2.6745788	2.6745788	4500	0%	0	0	0%	D
Sodium, meq	B	meq/L	1.829088	3.658176		0	0	0	0.1163442	0.1163442	0	0%	0	0	0%	D
Strontium	B	mg/L	0.07704	0.15408		0	0	0	0.0005995	0.01	18	0%	0	0	0%	
Tellurium	B	mg/L	0.01598	0		0	0	0	0.0548726	0.0548726	90	0%	0	0	0%	D
Thallium	B	mg/L	0.0012	0		0	0	0	0.0171589	0.0171589	225	0%	0	0	0%	D
Tin	B	mg/L	-0.00015	0		0	0	0	0.0181797	0.0181797	225	0%	0	0	0%	D
Titanium	B	mg/L	0.00562	0.01124		0	0	0	0.0052014	0.0052014	225	0%	0	0	0%	
Uranium	B	mg/L	-0.02708	0		0	0	0	0.2467035	0.2467035	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/L	-18.33316	0		0	0	0	167.0183	167.0183	0	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685576	B18020138-001	200.7.8-W-TR	SD		2/6/2018 7:04:23	5	118185	2/5/2018 8:0	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.033098	0		0	0	0.28968	0.4687399	0.4687399	18	0%	0	0		
Antimony	A	mg/L	-0.010526	0		0	0	0	0.2434465	0.2434465	225	0%	0	0		
Arsenic	A	mg/L	-0.00315	0		0	0	0	0.1523308	0.1523308	225	0%	0	0		
Barium	A	mg/L	0.025282	0.25282		0	0	0.25178	0.1205703	0.1205703	18	0%	0	0		N
Beryllium	A	mg/L	-0.00005	0		0	0	0	0.0322334	0.0322334	22.5	0%	0	0		
Boron	A	mg/L	0.015152	0.15152		0	0	0.13964	0.1159447	0.1159447	450	0%	0	0		N
Cadmium	A	mg/L	-0.000196	0		0	0	0	0.0197325	0.0197325	90	0%	0	0		
Calcium	A	mg/L	5.4068	54.068		0	0	52.934	2.5730743	2.5730743	180	0%	0	0	2%	
Chromium	A	mg/L	0.008172	0.08172		0	0	0	0.016388	0.016388	225	0%	0	0		N
Cobalt	A	mg/L	0.00045	0		0	0	0	0.0280567	0.0280567	450	0%	0	0		
Copper	A	mg/L	0.009466	0.09466		0	0	0.08172	0.0618283	0.0618283	225	0%	0	0		N
Gold	A	mg/L	0.001338	0		0	0	0	0.1504012	0.1504012	90	0%	0	0		
Iron	A	mg/L	0.042354	0		0	0	0.54378	1.0733912	1.0733912	1800	0%	0	0		
Lead	A	mg/L	-0.003976	0		0	0	0	0.2196711	0.2196711	900	0%	0	0		
Lithium	A	mg/L	0.001192	0		0	0	0	0.0758808	0.1	22.5	0%	0	0		
Magnesium	A	mg/L	1.63238	16.3238		0	0	15.8614	0.2843589	1	4500	0%	0	0	3%	
Manganese	A	mg/L	0.003544	0.03544		0	0	0.03496	0.0077213	0.0077213	45	0%	0	0		N
Molybdenum	A	mg/L	-0.000712	0		0	0	0	0.0288133	0.0288133	225	0%	0	0		
Nickel	A	mg/L	-0.000502	0		0	0	0	0.0112282	0.0112282	225	0%	0	0		
Phosphorus	A	mg/L	0.6783	6.783		0	0	6.7696	0.1854539	0.1854539	360	0%	0	0	0%	
Potassium	A	mg/L	1.52374	15.2374		0	0	15.6906	0.6774634	1	900	0%	0	0	3%	
Selenium	A	mg/L	0.004876	0		0	0	0	0.2564714	0.2564714	225	0%	0	0		
Silicon	A	mg/L	0.77292	7.7292		0	0	7.6204	0.2748737	0.2748737	450	0%	0	0	1%	
Silver	A	mg/L	-0.001904	0		0	0	0	1.1340968	1.1340968	2	0%	0	0		
Sodium	A	mg/L	8.3312	83.312		0	0	84.096	13.372894	13.372894	4500	0%	0	0		N
Strontium	A	mg/L	0.015552	0.15552		0	0	0.15408	0.0029977	0.01	18	0%	0	0	1%	
Tellurium	A	mg/L	0.01838	0		0	0	0	0.2743629	0.2743629	90	0%	0	0		
Thallium	A	mg/L	-0.006834	0		0	0	0	0.0857946	0.0857946	225	0%	0	0		
Tin	A	mg/L	-0.000726	0		0	0	0	0.0908987	0.0908987	225	0%	0	0		
Titanium	A	mg/L	0.000746	0		0	0	0.01124	0.0260070	0.0260070	225	0%	0	0		
Uranium	A	mg/L	-0.042614	0		0	0	0	1.2335177	1.2335177	900	0%	0	0		
Vanadium	A	mg/L	-0.000608	0		0	0	0	0.0421107	0.0421107	225	0%	0	0		
Zinc	A	mg/L	0.014338	0.14338		0	0	0.12056	0.0254544	0.0254544	90	0%	0	0		N
Calcium, meq	C	meq/L	0.26979932	2.6979932		0	0	2.6414066	0.1283964	0.1283964	0	0%	0	0	2%	
Magnesium, meq	C	meq/L	0.13434487	1.34344874		0	0	1.3053932	0.0234027	0.0823	0	0%	0	0	3%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685576	B18020138-001	200.7.8-W-TR	SD		2/6/2018 7:04:23	5	118185	2/5/2018 8:0	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium, meq	C	meq/L	0.03897727	0.38977269		0	0	0.4013655	0.0173295	0.02558	0	0%	0	0	3%	
Silica	C	mg/L	1.65343046	16.5343046		0	0	16.30156	0.5880099	0.5880099	1000	0%	0	0	1%	
Silicon as SiO2	C	mg/L	1.65343046	16.5343046		0	0	16.30156	0.5880099	0.5880099	1000	0%	0	0	1%	
Sodium, meq	C	meq/L	0.3624072	3.624072		0	0	3.658176	0.5817209	0.5817209	0	0%	0	0		N
Uranium, Activity	C	pCi/L	-28.849678	0		0	0	0	835.0915	835.0915	0	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685577	B18020138-001	200.7.8-W-TR	PDS		2/6/2018 7:08:14	1.03	118185	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.85339806	9.998		10.3	0.28968	0	0.0965604	0.0965604	18	94%	70	130	0%	
Antimony	A	mg/L	1.00203883	2.0642		2.06	0	0	0.05015	0.05015	225	100%	70	130	0%	
Arsenic	A	mg/L	1.02009709	2.1014		2.06	0	0	0.0313801	0.0313801	225	102%	70	130	0%	
Barium	A	mg/L	1.03524272	2.1326		2.06	0.25178	0	0.0248375	0.05	18	91%	70	130	0%	
Beryllium	A	mg/L	0.50213592	1.0344		1.03	0	0	0.0066401	0.0066401	22.5	100%	70	130	0%	
Boron	A	mg/L	1.08766990	2.2406		2.06	0.13964	0	0.0238846	0.05	450	102%	70	130	0%	
Cadmium	A	mg/L	0.47114563	0.97056		1.03	0	0	0.0040649	0.0040649	90	94%	70	130	0%	
Calcium	A	mg/L	73.5398058	151.492		103	52.934	0	0.5300533	1	180	96%	70	130	0%	
Chromium	A	mg/L	0.94833981	1.95358		2.06	0	0	0.0033759	0.005	225	95%	70	130	0%	
Cobalt	A	mg/L	0.91000971	1.87462		2.06	0	0	0.0057797	0.0057797	450	91%	70	130	0%	
Copper	A	mg/L	0.98398058	2.027		2.06	0.08172	0	0.0127366	0.0127366	225	94%	70	130	0%	
Gold	A	mg/L	0.89283495	1.83924		2.06	0	0	0.0309826	0.0309826	90	89%	70	130	0%	
Iron	A	mg/L	5.1715534	10.6534		10.3	0.54378	0	0.2211186	0.2211186	1800	98%	70	130	0%	
Lead	A	mg/L	0.95750485	1.97246		2.06	0	0	0.0452523	0.0452523	900	96%	70	130	0%	
Lithium	A	mg/L	1.01339806	2.0876		2.06	0	0	0.0156314	0.1	22.5	101%	70	130	0%	
Magnesium	A	mg/L	55.5611650	114.456		103	15.8614	0	0.0585779	1	4500	96%	70	130	0%	
Manganese	A	mg/L	4.80572816	9.8998		10.3	0.03496	0	0.0015906	0.0015906	45	96%	70	130	0%	
Molybdenum	A	mg/L	0.98766990	2.0346		2.06	0	0	0.0059355	0.0059355	225	99%	70	130	0%	
Nickel	A	mg/L	0.88466019	1.8224		2.06	0	0	0.002313	0.005	225	88%	70	130	0%	
Phosphorus	A	mg/L	13.4427184	27.692		20.6	6.7696	0	0.0382035	0.1	360	102%	70	130	0%	
Potassium	A	mg/L	56.8223301	117.054		103	15.6906	0	0.1395575	1	900	98%	70	130	0%	
Selenium	A	mg/L	0.92147573	1.89824		2.06	0	0	0.0528331	0.0528331	225	92%	70	130	0%	
Silicon	A	mg/L	13.6912621	28.204		20.6	7.6204	0	0.056624	0.1	450	100%	70	130	0%	
Silver	A	mg/L	0.38450485	0.79208		1.03	0	0	0.2336239	0.2336239	2	77%	70	130	0%	
Sodium	A	mg/L	87.3504854	179.942		103	84.096	0	2.7548162	2.7548162	4500	93%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685577	B18020138-001	200.7.8-W-TR	PDS		2/6/2018 7:08:14	1.03	118185	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium	A	mg/L	0.99563107	2.051		2.06	0.15408	0	0.0006175	0.01	18	92%	70	130	0%	
Tellurium	A	mg/L	0.95763107	1.97272		2.06	0	0	0.0565188	0.0565188	90	96%	70	130	0%	
Thallium	A	mg/L	0.91082524	1.8763		2.06	0	0	0.0176737	0.0176737	225	91%	70	130	0%	
Tin	A	mg/L	0.99485437	2.0494		2.06	0	0	0.0187251	0.05	225	99%	70	130	0%	
Titanium	A	mg/L	1.00776699	2.076		2.06	0.01124	0	0.0053574	0.0053574	225	100%	70	130	0%	
Uranium	A	mg/L	0.89626214	1.8463		2.06	0	0	0.2541047	0.2541047	900	90%	70	130	0%	
Vanadium	A	mg/L	1.0215534	2.1044		2.06	0	0	0.0086748	0.01	225	102%	70	130	0%	
Zinc	A	mg/L	1.03126214	2.1244		2.06	0.12056	0	0.0052436	0.01	90	97%	70	130	0%	
Calcium, meq	C	meq/L	3.66963631	7.5594508		0	2.6414066	0	0.0264497	0.0499	0	0%	70	130	0%	
Magnesium, meq	C	meq/L	4.57268388	9.4197288		0	1.3053932	0	0.004821	0.0823	0	0%	70	130	0%	
Potassium, meq	C	meq/L	1.45351520	2.99424132		0	0.4013655	0	0.0035699	0.02558	0	0%	70	130	0%	
Silica	C	mg/L	29.288348	60.3339968		44.084	16.30156	0	0.1211300	0.21392	1000	100%	70	130	0%	
Silicon as SiO2	C	mg/L	29.288348	60.3339968		44.084	16.30156	0	0.1211300	0.21392	1000	100%	70	130	0%	
Sodium, meq	C	meq/L	3.79974612	7.827477		0	3.658176	0	0.1198345	0.1198345	0	0%	70	130	0%	
Uranium, Activity	C	pCi/L	606.769466	1249.9451		0	0	0	172.02885	172.02885	0	0%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685578	B18020138-001	200.7.8-W-TR	MS3		2/6/2018 7:11:49	1	118185	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.7736	5.5472		5	0.28968	0	0.093748	0.093748	18	105%	70	130	0%	
Antimony	A	mg/L	0.51924	1.03848		1	0	0	0.0486893	0.0486893	225	104%	70	130	0%	
Arsenic	A	mg/L	0.59331	1.18662		1	0	0	0.0304662	0.0304662	225	119%	70	130	0%	
Barium	A	mg/L	0.61354	1.22708		1	0.25178	0	0.0241141	0.05	18	98%	70	130	0%	
Beryllium	A	mg/L	0.26651	0.53302		0.5	0	0	0.0064467	0.0064467	22.5	107%	70	130	0%	
Boron	A	mg/L	0.59782	1.19564		1	0.13964	0	0.0231889	0.05	450	106%	70	130	0%	
Cadmium	A	mg/L	0.25314	0.50628		0.5	0	0	0.0039465	0.0039465	90	101%	70	130	0%	
Calcium	A	mg/L	52.029	104.058		50	52.934	0	0.5146149	1	180	102%	70	130	0%	
Chromium	A	mg/L	0.50705	1.0141		1	0	0	0.0032776	0.005	225	101%	70	130	0%	
Cobalt	A	mg/L	0.49259	0.98518		1	0	0	0.0056113	0.0056113	450	99%	70	130	0%	
Copper	A	mg/L	0.54524	1.09048		1	0.08172	0	0.0123657	0.0123657	225	101%	70	130	0%	
Gold	A	mg/L	0.30584	0.61168		1	0	0	0.0300802	0.0300802	90	61%	70	130	0%	S
Iron	A	mg/L	2.8303	5.6606		5	0.54378	0	0.2146782	0.2146782	1800	102%	70	130	0%	
Lead	A	mg/L	0.51833	1.03666		1	0	0	0.0439342	0.0439342	900	104%	70	130	0%	
Lithium	A	mg/L	0.54553	1.09106		1	0	0	0.0151762	0.1	22.5	109%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685578	B18020138-001	200.7.8-W-TR	MS3		2/6/2018 7:11:49	1	118185	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium	A	mg/L	33.712	67.424		50	15.8614	0	0.0568718	1	4500	103%	70	130	0%	
Manganese	A	mg/L	2.5715	5.143		5	0.03496	0	0.0015443	0.0015443	45	102%	70	130	0%	
Molybdenum	A	mg/L	0.51173	1.02346		1	0	0	0.0057627	0.0057627	225	102%	70	130	0%	
Nickel	A	mg/L	0.47855	0.9571		1	0	0	0.0022456	0.005	225	96%	70	130	0%	
Phosphorus	A	mg/L	8.5502	17.1004		10	6.7696	0	0.0370908	0.1	360	103%	70	130	0%	
Potassium	A	mg/L	34.006	68.012		50	15.6906	0	0.1354927	1	900	105%	70	130	0%	
Selenium	A	mg/L	0.49122	0.98244		1	0	0	0.0512943	0.0512943	225	98%	70	130	0%	
Silicon	A	mg/L	9.014	18.028		10	7.6204	0	0.0549747	0.1	450	104%	70	130	0%	
Silver	A	mg/L	0.04217	0		0.1	0	0	0.2268194	0.2268194	2	0%	70	130	0%	S
Sodium	A	mg/L	66.338	132.676		50	84.096	0	2.6745788	2.6745788	4500	97%	70	130	0%	
Strontium	A	mg/L	0.57066	1.14132		1	0.15408	0	0.0005995	0.01	18	99%	70	130	0%	
Tellurium	A	mg/L	0.50479	1.00958		0	0	0	0.0548726	0.0548726	90	0%	70	130	0%	
Thallium	A	mg/L	0.48451	0.96902		1	0	0	0.0171589	0.0171589	225	97%	70	130	0%	
Tin	A	mg/L	0.37814	0.75628		1	0	0	0.0181797	0.05	225	76%	70	130	0%	
Titanium	A	mg/L	0.49893	0.99786		1	0.01124	0	0.0052014	0.0052014	225	99%	70	130	0%	
Uranium	A	mg/L	0.48952	0.97904		1	0	0	0.2467035	0.2467035	900	98%	70	130	0%	
Vanadium	A	mg/L	0.54795	1.0959		1	0	0	0.0084221	0.01	225	110%	70	130	0%	
Zinc	A	mg/L	0.58898	1.17796		1	0.12056	0	0.0050909	0.01	90	106%	70	130	0%	
Calcium, meq	C	meq/L	2.5962471	5.1924942		0	2.6414066	0	0.0256793	0.0499	0	0%	70	130	0%	
Magnesium, meq	C	meq/L	2.7744976	5.5489952		0	1.3053932	0	0.0046805	0.0823	0	0%	70	130	0%	
Potassium, meq	C	meq/L	0.86987348	1.73974696		0	0.4013655	0	0.0034659	0.02558	0	0%	70	130	0%	
Silica	C	mg/L	19.2827488	38.5654976		21.4	16.30156	0	0.117602	0.21392	1000	104%	70	130	0%	
Silicon as SiO2	C	mg/L	19.2827488	38.5654976		21.4	16.30156	0	0.117602	0.21392	1000	104%	70	130	0%	
Sodium, meq	C	meq/L	2.885703	5.771406		0	3.658176	0	0.1163442	0.1163442	0	0%	70	130	0%	
Uranium, Activity	C	pCi/L	331.40504	662.81008		0	0	0	167.0183	167.0183	0	0%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685579	B18020138-001	200.7.8-W-TR	MSD3		2/6/2018 7:15:30	1	118185	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.7161	5.4322		5	0.28968	5.5472	0.093748	0.093748	18	103%	70	130	2%	
Antimony	A	mg/L	0.52312	1.04624		1	0	1.03848	0.0486893	0.0486893	225	105%	70	130	1%	
Arsenic	A	mg/L	0.57349	1.14698		1	0	1.18662	0.0304662	0.0304662	225	115%	70	130	3%	
Barium	A	mg/L	0.59298	1.18596		1	0.25178	1.22708	0.0241141	0.05	18	93%	70	130	3%	
Beryllium	A	mg/L	0.25753	0.51506		0.5	0	0.53302	0.0064467	0.0064467	22.5	103%	70	130	3%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685579	B18020138-001	200.7.8-W-TR	MSD3		2/6/2018 7:15:30	1	118185	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.57836	1.15672		1	0.13964	1.19564	0.0231889	0.05	450	102%	70	130	3%	
Cadmium	A	mg/L	0.24516	0.49032		0.5	0	0.50628	0.0039465	0.0039465	90	98%	70	130	3%	
Calcium	A	mg/L	51.818	103.636		50	52.934	104.058	0.5146149	1	180	101%	70	130	0%	
Chromium	A	mg/L	0.49053	0.98106		1	0	1.0141	0.0032776	0.005	225	98%	70	130	3%	
Cobalt	A	mg/L	0.47668	0.95336		1	0	0.98518	0.0056113	0.0056113	450	95%	70	130	3%	
Copper	A	mg/L	0.52513	1.05026		1	0.08172	1.09048	0.0123657	0.0123657	225	97%	70	130	4%	
Gold	A	mg/L	0.29506	0.59012		1	0	0.61168	0.0300802	0.0300802	90	59%	70	130	4%	S
Iron	A	mg/L	2.7562	5.5124		5	0.54378	5.6606	0.2146782	0.2146782	1800	99%	70	130	3%	
Lead	A	mg/L	0.50306	1.00612		1	0	1.03666	0.0439342	0.0439342	900	101%	70	130	3%	
Lithium	A	mg/L	0.51862	1.03724		1	0	1.09106	0.0151762	0.1	22.5	104%	70	130	5%	
Magnesium	A	mg/L	33.017	66.034		50	15.8614	67.424	0.0568718	1	4500	100%	70	130	2%	
Manganese	A	mg/L	2.4836	4.9672		5	0.03496	5.143	0.0015443	0.0015443	45	99%	70	130	3%	
Molybdenum	A	mg/L	0.51792	1.03584		1	0	1.02346	0.0057627	0.0057627	225	104%	70	130	1%	
Nickel	A	mg/L	0.46393	0.92786		1	0	0.9571	0.0022456	0.005	225	93%	70	130	3%	
Phosphorus	A	mg/L	8.4717	16.9434		10	6.7696	17.1004	0.0370908	0.1	360	102%	70	130	1%	
Potassium	A	mg/L	32.842	65.684		50	15.6906	68.012	0.1354927	1	900	100%	70	130	3%	
Selenium	A	mg/L	0.48246	0.96492		1	0	0.98244	0.0512943	0.0512943	225	96%	70	130	2%	
Silicon	A	mg/L	9.1128	18.2256		10	7.6204	18.028	0.0549747	0.1	450	106%	70	130	1%	
Silver	A	mg/L	0.0398	0		0.1	0	0	0.2268194	0.2268194	2	0%	70	130		S
Sodium	A	mg/L	65.91	131.82		50	84.096	132.676	2.6745788	2.6745788	4500	95%	70	130	1%	
Strontium	A	mg/L	0.55035	1.1007		1	0.15408	1.14132	0.0005995	0.01	18	95%	70	130	4%	
Tellurium	A	mg/L	0.50733	1.01466		1	0	1.00958	0.0548726	0.0548726	90	101%	70	130	1%	
Thallium	A	mg/L	0.47687	0.95374		1	0	0.96902	0.0171589	0.0171589	225	95%	70	130	2%	
Tin	A	mg/L	0.37917	0.75834		1	0	0.75628	0.0181797	0.05	225	76%	70	130	0%	
Titanium	A	mg/L	0.50196	1.00392		1	0.01124	0.99786	0.0052014	0.0052014	225	99%	70	130	1%	
Uranium	A	mg/L	0.4636	0.9272		1	0	0.97904	0.2467035	0.2467035	900	93%	70	130	5%	
Vanadium	A	mg/L	0.52662	1.05324		1	0	1.0959	0.0084221	0.01	225	105%	70	130	4%	
Zinc	A	mg/L	0.5708	1.1416		1	0.12056	1.17796	0.0050909	0.01	90	102%	70	130	3%	
Calcium, meq	C	meq/L	2.5857182	5.1714364		0	2.6414066	5.1924942	0.0256793	0.0499	0	0%	70	130	0%	
Magnesium, meq	C	meq/L	2.7172991	5.4345982		0	1.3053932	5.5489952	0.0046805	0.0823	0	0%	70	130	2%	
Potassium, meq	C	meq/L	0.84009836	1.68019672		0	0.4013655	1.739747	0.0034659	0.02558	0	0%	70	130	3%	
Silica	C	mg/L	19.4941018	38.9882035		21.4	16.30156	38.565498	0.117602	0.21392	1000	106%	70	130	1%	
Silicon as SiO2	C	mg/L	19.4941018	38.9882035		21.4	16.30156	38.565498	0.117602	0.21392	1000	106%	70	130	1%	
Sodium, meq	C	meq/L	2.867085	5.73417		0	3.658176	5.771406	0.1163442	0.1163442	0	0%	70	130	1%	
Uranium, Activity	C	pCi/L	313.8572	627.7144		0	0	662.81008	167.0183	167.0183	0	0%	70	130	5%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685580	B18020138-002	200.7.8-W-TR	SAMP		2/6/2018 7:19:12	1	118185	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.13292	0.13292		0	0	0	0.0115945	0.0115945	450	0%	0	0	0%	DL
Phosphorus	A	mg/L	0.29248	0.29248		0	0	0	0.0185454	0.1	360	0%	0	0	0%	
Vanadium	A	mg/L	0.00085	0		0	0	0	0.0042111	0.01	225	0%	0	0	0%	
Aluminum	B	mg/L	0.02101	0		0	0	0	0.046874	0.046874	18	0%	0	0	0%	DL
Antimony	B	mg/L	-0.00938	0		0	0	0	0.0243446	0.0243446	225	0%	0	0	0%	DL
Barium	B	mg/L	0.19511	0.19511		0	0	0	0.0120570	0.05	18	0%	0	0	0%	
Beryllium	B	mg/L	-0.00005	0		0	0	0	0.0032233	0.0032233	22.5	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00068	0		0	0	0	0.0019732	0.0019732	90	0%	0	0	0%	DL
Calcium	B	mg/L	49.732	49.732		0	0	0	0.2573074	1	180	0%	0	0	0%	
Calcium, meq	B	meq/L	2.4816268	2.4816268		0	0	0	0.0128396	0.0499	0	0%	0	0	0%	
Chromium	B	mg/L	0.00039	0		0	0	0	0.0016388	0.0016388	225	0%	0	0	0%	DL
Cobalt	B	mg/L	0.0002	0		0	0	0	0.0028057	0.0028057	450	0%	0	0	0%	DL
Copper	B	mg/L	0.00728	0.00728		0	0	0	0.0061828	0.0061828	225	0%	0	0	0%	DL
Gold	B	mg/L	0.00424	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	DL
Lead	B	mg/L	-0.00222	0		0	0	0	0.0219671	0.0219671	900	0%	0	0	0%	DL
Lithium	B	mg/L	0.01334	0.01334		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	J
Magnesium	B	mg/L	14.438	14.438		0	0	0	0.0284359	1	4500	0%	0	0	0%	
Magnesium, meq	B	meq/L	1.1882474	1.1882474		0	0	0	0.0023403	0.0823	0	0%	0	0	0%	
Manganese	B	mg/L	0.02619	0.02619		0	0	0	0.0007721	0.001	45	0%	0	0	0%	
Molybdenum	B	mg/L	0.00244	0		0	0	0	0.0028813	0.0028813	225	0%	0	0	0%	DL
Nickel	B	mg/L	0.00034	0		0	0	0	0.0011228	0.0011228	225	0%	0	0	0%	DL
Potassium	B	mg/L	12.197	12.197		0	0	0	0.0677463	1	900	0%	0	0	0%	
Potassium, meq	B	meq/L	0.31199926	0.31199926		0	0	0	0.001733	0.02558	0	0%	0	0	0%	
Selenium	B	mg/L	0.00612	0		0	0	0	0.0256471	0.0256471	225	0%	0	0	0%	DL
Silica	B	mg/L	15.5104835	15.5104835		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Silicon	B	mg/L	7.2506	7.2506		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Silicon as SiO2	B	mg/L	15.5104835	15.5104835		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Sodium	B	mg/L	83.276	83.276		0	0	0	1.3372894	1.3372894	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	3.622506	3.622506		0	0	0	0.0581721	0.0581721	0	0%	0	0	0%	DL
Strontium	B	mg/L	0.1379	0.1379		0	0	0	0.0002998	0.01	18	0%	0	0	0%	
Tellurium	B	mg/L	0.01673	0		0	0	0	0.0274363	0.0274363	90	0%	0	0	0%	DL
Thallium	B	mg/L	0.0001	0		0	0	0	0.0085795	0.0085795	225	0%	0	0	0%	DL
Tin	B	mg/L	0.00041	0		0	0	0	0.0090899	0.0090899	225	0%	0	0	0%	DL
Titanium	B	mg/L	0.00086	0		0	0	0	0.0026007	0.005	225	0%	0	0	0%	
Uranium	B	mg/L	-0.03193	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685580	B18020138-002	200.7.8-W-TR	SAMP		2/6/2018 7:19:12	1	118185	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium, Activity	B	pCi/L	-21.61661	0		0	0	0	83.50915	83.50915	0	0%	0	0	0%	DL
Zinc	B	mg/L	0.05713	0.05713		0	0	0	0.0025454	0.008	90	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685581	B18020155-001	200.7.8-W-TR	SAMP		2/6/2018 7:23:09	1	118185	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.19263	0.19263		0	0	0	0.0120570	0.05	18	0%	0	0	0%	
Boron	A	mg/L	0.02839	0.02839		0	0	0	0.0115945	0.05	450	0%	0	0	0%	J
Calcium	A	mg/L	49.632	49.632		0	0	0	0.2573074	1	180	0%	0	0	0%	
Chromium	A	mg/L	-0.00215	0		0	0	0	0.0016388	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00046	0		0	0	0	0.0028057	0.005	450	0%	0	0	0%	
Iron	A	mg/L	11.826	11.826		0	0	0	0.1073391	0.1073391	1800	0%	0	0	0%	L
Lithium	A	mg/L	0.00226	0		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	9.7218	9.7218		0	0	0	0.0284359	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.93388	0.93388		0	0	0	0.0007721	0.001	45	0%	0	0	0%	
Nickel	A	mg/L	-0.00117	0		0	0	0	0.0011228	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.09466	0.09466		0	0	0	0.0185454	0.1	360	0%	0	0	0%	J
Potassium	A	mg/L	5.7406	5.7406		0	0	0	0.0677463	1	900	0%	0	0	0%	
Silicon	A	mg/L	6.9865	6.9865		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Strontium	A	mg/L	0.10477	0.10477		0	0	0	0.0002998	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00322	0		0	0	0	0.0090899	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00046	0		0	0	0	0.0026007	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.00143	0		0	0	0	0.0042111	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00331	0.00331		0	0	0	0.0025454	0.01	90	0%	0	0	0%	J
Aluminum	B	mg/L	0.00526	0		0	0	0	0.046874	0.046874	18	0%	0	0	0%	DL
Antimony	B	mg/L	-0.00542	0		0	0	0	0.0243446	0.0243446	225	0%	0	0	0%	DL
Beryllium	B	mg/L	-0.00001	0		0	0	0	0.0032233	0.0032233	22.5	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00051	0		0	0	0	0.0019732	0.0019732	90	0%	0	0	0%	DL
Copper	B	mg/L	0.00189	0		0	0	0	0.0061828	0.0061828	225	0%	0	0	0%	DL
Gold	B	mg/L	-0.00983	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	DL
Lead	B	mg/L	-0.00346	0		0	0	0	0.0219671	0.0219671	900	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00039	0		0	0	0	0.0028813	0.0028813	225	0%	0	0	0%	DL
Selenium	B	mg/L	0.00446	0		0	0	0	0.0256471	0.0256471	225	0%	0	0	0%	DL
Sodium	B	mg/L	7.2677	7.2677		0	0	0	1.3372894	1.3372894	4500	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685581	B18020155-001	200.7.8-W-TR	SAMP		2/6/2018 7:23:09	1	118185	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Sodium, meq	B	meq/L	0.31614495	0.31614495		0	0	0	0.0581721	0.0581721	0	0%	0	0	0%	DL
Tellurium	B	mg/L	0.01822	0		0	0	0	0.0274363	0.0274363	90	0%	0	0	0%	DL
Thallium	B	mg/L	0.00078	0		0	0	0	0.0085795	0.0085795	225	0%	0	0	0%	DL
Uranium	B	mg/L	-0.04057	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	-27.46589	0		0	0	0	83.50915	83.50915	0	0%	0	0	0%	DL
Calcium, meq	C	meq/L	2.4766368	2.4766368		0	0	0	0.0128396	0.0499	0	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.80010414	0.80010414		0	0	0	0.0023403	0.0823	0	0%	0	0	0%	
Potassium, meq	C	meq/L	0.14684455	0.14684455		0	0	0	0.001733	0.02558	0	0%	0	0	0%	
Silica	C	mg/L	14.9455208	14.9455208		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	14.9455208	14.9455208		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685582	MB-118186	ICP-200.7-W-T	MBLK		2/6/2018 7:26:56	1	118186	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00385	0		0	0	0	0.046874	0.1	18	0%	0	0	0%	
Antimony	A	mg/L	-0.00615	0		0	0	0	0.0243446	0.1	225	0%	0	0	0%	
Arsenic	A	mg/L	-0.00113	0		0	0	0	0.0152331	0.1	225	0%	0	0	0%	
Barium	A	mg/L	0.00004	0		0	0	0	0.0120570	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00008	0		0	0	0	0.0032233	0.01	22.5	0%	0	0	0%	
Boron	A	mg/L	0.00851	0		0	0	0	0.0115945	0.1	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00025	0		0	0	0	0.0019732	0.01	90	0%	0	0	0%	
Calcium	A	mg/L	0.04153	0		0	0	0	0.2573074	1	180	0%	0	0	0%	
Chromium	A	mg/L	-0.00013	0		0	0	0	0.0016388	0.05	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00083	0		0	0	0	0.0028057	0.05	450	0%	0	0	0%	
Copper	A	mg/L	0.0011	0		0	0	0	0.0061828	0.01	225	0%	0	0	0%	
Gold	A	mg/L	0.00135	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	
Iron	A	mg/L	0.00567	0.00567		0	0	0	0.003702	0.02	360	0%	0	0	0%	
Lead	A	mg/L	0.00157	0		0	0	0	0.0219671	0.05	900	0%	0	0	0%	
Lithium	A	mg/L	-0.00055	0		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.00778	0		0	0	0	0.0087454	1	180	0%	0	0	0%	
Manganese	A	mg/L	0.00026	0		0	0	0	0.0007721	0.01	45	0%	0	0	0%	
Molybdenum	A	mg/L	-0.00085	0		0	0	0	0.0028813	0.1	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00029	0		0	0	0	0.0011228	0.01	225	0%	0	0	0%	
Phosphorus	A	mg/L	-0.00084	0		0	0	0	0.0185454	0.1	360	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685582	MB-118186	ICP-200.7-W-T	MBLK		2/6/2018 7:26:56	1	118186	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium	A	mg/L	-0.01418	0		0	0	0	0.0677463	1	900	0%	0	0	0%	
Selenium	A	mg/L	0.00315	0		0	0	0	0.0256471	0.1	225	0%	0	0	0%	
Silicon	A	mg/L	0.01358	0		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Silver	A	mg/L	-0.00064	0		0	0	0	0.1134097	0.1134097	2	0%	0	0	0%	
Sodium	A	mg/L	0.0602	0		0	0	0	0.1801052	1	450	0%	0	0	0%	
Strontium	A	mg/L	0.00011	0		0	0	0	0.0002998	0.1	18	0%	0	0	0%	
Tellurium	A	mg/L	0.01193	0		0	0	0	0.0274363	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00177	0		0	0	0	0.0085795	0.1	225	0%	0	0	0%	
Tin	A	mg/L	-0.00094	0		0	0	0	0.0090899	0.1	225	0%	0	0	0%	
Titanium	A	mg/L	-0.0004	0		0	0	0	0.0026007	0.1	225	0%	0	0	0%	
Uranium	A	mg/L	-0.03574	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00055	0		0	0	0	0.0042111	0.1	225	0%	0	0	0%	
Zinc	A	mg/L	0.00028	0		0	0	0	0.0025454	0.01	90	0%	0	0	0%	
Silica	C	mg/L	0.0290612	0		0	0	0	0.058823	0.214	210	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0290612	0		0	0	0	0.058823	0.214	210	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685583	LCS-118186	ICP-200.7-W-T	LCS		2/6/2018 7:30:51	1	118186	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5528	2.5528		2.5	0	0	0.046874	0.1	18	102%	85	115	0%	
Antimony	A	mg/L	0.51662	0.51662		0.5	0	0	0.0243446	0.1	225	103%	85	115	0%	
Arsenic	A	mg/L	0.56629	0.56629		0.5	0	0	0.0152331	0.1	225	113%	85	115	0%	
Barium	A	mg/L	0.45805	0.45805		0.5	0	0	0.0120570	0.1	18	92%	85	115	0%	
Beryllium	A	mg/L	0.25568	0.25568		0.25	0	0	0.0032233	0.01	22.5	102%	85	115	0%	
Boron	A	mg/L	0.5188	0.5188		0.5	0	0	0.0115945	0.1	450	104%	85	115	0%	
Cadmium	A	mg/L	0.24362	0.24362		0.25	0	0	0.0019732	0.01	90	97%	85	115	0%	
Calcium	A	mg/L	25.263	25.263		25	0	0	0.2573074	1	180	101%	85	115	0%	
Chromium	A	mg/L	0.49296	0.49296		0.5	0	0	0.0016388	0.05	225	99%	85	115	0%	
Cobalt	A	mg/L	0.47568	0.47568		0.5	0	0	0.0028057	0.05	450	95%	85	115	0%	
Copper	A	mg/L	0.475	0.475		0.5	0	0	0.0061828	0.01	225	95%	85	115	0%	
Gold	A	mg/L	0.44023	0.44023		0.5	0	0	0.0150401	0.0150401	90	88%	85	115	0%	
Iron	A	mg/L	2.737	2.737		2.5	0.00567	0	0.003702	0.02	360	109%	85	115	0%	
Lead	A	mg/L	0.50508	0.50508		0.5	0	0	0.0219671	0.05	900	101%	85	115	0%	
Lithium	A	mg/L	0.49764	0.49764		0.5	0	0	0.0075881	0.1	22.5	100%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685583	LCS-118186	ICP-200.7-W-T	LCS		2/6/2018 7:30:51	1	118186	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium	A	mg/L	24.622	24.622		25	0	0	0.0284359	1	4500	98%	85	115	0%	
Manganese	A	mg/L	2.4685	2.4685		2.5	0	0	0.0007721	0.01	45	99%	85	115	0%	
Molybdenum	A	mg/L	0.51592	0.51592		0.5	0	0	0.0028813	0.1	225	103%	85	115	0%	
Nickel	A	mg/L	0.46163	0.46163		0.5	0	0	0.0011228	0.01	225	92%	85	115	0%	
Phosphorus	A	mg/L	5.2628	5.2628		5	0	0	0.0185454	0.1	360	105%	85	115	0%	
Potassium	A	mg/L	24.745	24.745		25	0	0	0.0677463	1	900	99%	85	115	0%	
Selenium	A	mg/L	0.47893	0.47893		0.5	0	0	0.0256471	0.1	225	96%	85	115	0%	
Silicon	A	mg/L	5.165	5.165		5	0	0	0.0274874	0.1	450	103%	85	115	0%	
Silver	A	mg/L	0.03544	0		0.05	0	0	0.1134097	0.1134097	2	0%	85	115	0%	S
Sodium	A	mg/L	24.113	24.113		25	0	0	1.3372894	1.3372894	4500	96%	85	115	0%	
Strontium	A	mg/L	0.46602	0.46602		0.5	0	0	0.0002998	0.1	18	93%	85	115	0%	
Tellurium	A	mg/L	0.5018	0.5018		0.5	0	0	0.0274363	0.1	90	100%	85	115	0%	
Thallium	A	mg/L	0.48251	0.48251		0.5	0	0	0.0085795	0.1	225	97%	85	115	0%	
Tin	A	mg/L	0.52972	0.52972		0.5	0	0	0.0090899	0.1	225	106%	85	115	0%	
Titanium	A	mg/L	0.52021	0.52021		0.5	0	0	0.0026007	0.1	225	104%	85	115	0%	
Uranium	A	mg/L	0.49031	0.49031		0.5	0	0	0.1233518	0.1233518	900	98%	85	115	0%	
Vanadium	A	mg/L	0.52151	0.52151		0.5	0	0	0.0042111	0.1	225	104%	85	115	0%	
Zinc	A	mg/L	0.5063	0.5063		0.5	0	0	0.0025454	0.01	90	101%	85	115	0%	
Silica	C	mg/L	11.0531	11.0531		10.696	0	0	0.058823	0.214	210	103%	85	115	0%	
Silicon as SiO2	C	mg/L	11.0531	11.0531		10.696	0	0	0.058823	0.214	210	103%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685584	B18020177-001	200.7.8-W-T	SAMP		2/6/2018 7:34:25	1	118186	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.04148	0.04148		0	0	0	0.0115945	0.05	450	0%	0	0	0%	J
Calcium	A	mg/L	53.823	53.823		0	0	0	0.2573074	1	180	0%	0	0	0%	
Lithium	A	mg/L	0.0085	0.0085		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	16.487	16.487		0	0	0	0.0284359	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.02541	0.02541		0	0	0	0.0007721	0.001	45	0%	0	0	0%	
Phosphorus	A	mg/L	0.00872	0		0	0	0	0.0185454	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	1.4631	1.4631		0	0	0	0.0677463	1	900	0%	0	0	0%	
Silicon	A	mg/L	3.1166	3.1166		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Aluminum	B	mg/L	0.07625	0.07625		0	0	0	0.046874	0.046874	18	0%	0	0	0%	DL
Antimony	B	mg/L	-0.00499	0		0	0	0	0.0243446	0.0243446	225	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685584	B18020177-001	200.7.8-W-T	SAMP		2/6/2018 7:34:25	1	118186	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	B	mg/L	0.0005	0		0	0	0	0.0152331	0.0152331	225	0%	0	0	0%	DL
Barium	B	mg/L	0.05694	0.05694		0	0	0	0.0120570	0.05	18	0%	0	0	0%	
Beryllium	B	mg/L	-0.00002	0		0	0	0	0.0032233	0.0032233	22.5	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00033	0		0	0	0	0.0019732	0.0019732	90	0%	0	0	0%	DL
Chromium	B	mg/L	-0.00005	0		0	0	0	0.0016388	0.005	225	0%	0	0	0%	
Cobalt	B	mg/L	0.0003	0		0	0	0	0.0028057	0.005	450	0%	0	0	0%	
Copper	B	mg/L	0.00181	0		0	0	0	0.0061828	0.0061828	225	0%	0	0	0%	DL
Gold	B	mg/L	0.00186	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	DL
Lead	B	mg/L	0.00401	0		0	0	0	0.0219671	0.0219671	900	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00153	0		0	0	0	0.0028813	0.0028813	225	0%	0	0	0%	DL
Molybdenum as MoO3	B	mg/L	0.002295	0		0	0	0	0.004322	0.004322	2	0%	0	0	0%	DL
Nickel	B	mg/L	-0.0003	0		0	0	0	0.0011228	0.005	225	0%	0	0	0%	
Selenium	B	mg/L	0.00649	0		0	0	0	0.0256471	0.0256471	225	0%	0	0	0%	DL
Sodium	B	mg/L	25.486	25.486		0	0	0	1.3372894	1.3372894	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	1.108641	1.108641		0	0	0	0.0581721	0.0581721	0	0%	0	0	0%	DL
Strontium	B	mg/L	0.37215	0.37215		0	0	0	0.0002998	0.01	18	0%	0	0	0%	
Tellurium	B	mg/L	0.01272	0		0	0	0	0.0274363	0.0274363	90	0%	0	0	0%	DL
Thallium	B	mg/L	0.0022	0		0	0	0	0.0085795	0.0085795	225	0%	0	0	0%	DL
Tin	B	mg/L	-0.00022	0		0	0	0	0.0090899	0.05	225	0%	0	0	0%	
Titanium	B	mg/L	0.003	0.003		0	0	0	0.0026007	0.005	225	0%	0	0	0%	J
Uranium	B	mg/L	-0.01665	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	-11.27205	0		0	0	0	83.50915	83.50915	0	0%	0	0	0%	DL
Vanadium	B	mg/L	0.00114	0		0	0	0	0.0042111	0.01	225	0%	0	0	0%	
Zinc	B	mg/L	0.00241	0		0	0	0	0.0025454	0.01	90	0%	0	0	0%	
Calcium as CaCO3	C	mg/L	2.69115	2.69115		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		2.69115		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Magnesium, meq	C	meq/L	1.3568801	1.3568801		0	0	0	0.0023403	0.0823	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	0.0267704	0		0	0	0	0.0569344	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	0.0374261	0.0374261		0	0	0	0.001733	0.02558	5	0%	0	0	0%	
Silica	C	mg/L	6.66703072	6.66703072		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	6.66703072	6.66703072		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685585	CCV	ICP-200.7-W-D	CCV		2/6/2018 7:38:15	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5969	2.5969		2.5	0	0	0.0066084	0.1	18	104%	90	110	0%	
Antimony	A	mg/L	2.6212	2.6212		2.5	0	0	0.0356182	0.05	225	105%	90	110	0%	
Arsenic	A	mg/L	2.6601	2.6601		2.5	0	0	0.0231651	0.1	225	106%	90	110	0%	
Barium	A	mg/L	2.2934	2.2934		2.5	0	0	0.0003929	0.1	18	92%	90	110	0%	
Beryllium	A	mg/L	1.3083	1.3083		1.25	0	0	0.0002318	0.01	22.5	105%	90	110	0%	
Boron	A	mg/L	2.5905	2.5905		2.5	0	0	0.0080048	0.1	450	104%	90	110	0%	
Cadmium	A	mg/L	2.4366	2.4366		2.5	0	0	0.0010328	0.01	90	97%	90	110	0%	
Calcium	A	mg/L	25.4	25.4		25	0	0	0.1071422	1	180	102%	90	110	0%	
Chromium	A	mg/L	2.5028	2.5028		2.5	0	0	0.0010626	0.05	225	100%	90	110	0%	
Cobalt	A	mg/L	2.3991	2.3991		2.5	0	0	0.0033639	0.02	450	96%	90	110	0%	
Copper	A	mg/L	2.3965	2.3965		2.5	0	0	0.0048764	0.01	225	96%	90	110	0%	
Gold	A	mg/L	2.4128	2.4128		2.5	0	0	0.0189485	0.1	90	97%	90	110	0%	
Iron	A	mg/L	2.7505	2.7505		2.5	0	0	0.0250321	0.0250321	360	110%	90	110	0%	
Lead	A	mg/L	2.5492	2.5492		2.5	0	0	0.0187623	0.05	900	102%	90	110	0%	
Lithium	A	mg/L	1.2453	1.2453		1.25	0	0	0.0059040	0.1	22.5	100%	90	110	0%	
Magnesium	A	mg/L	24.538	24.538		25	0	0	0.0116555	1	180	98%	90	110	0%	
Manganese	A	mg/L	2.4705	2.4705		2.5	0	0	0.0010649	0.01	45	99%	90	110	0%	
Mercury	A	mg/L	1.0023	1.0023		1	0	0	0.0100947	0.02	45	100%	90	110	0%	
Molybdenum	A	mg/L	2.6098	2.6098		2.5	0	0	0.0031266	0.1	225	104%	90	110	0%	
Nickel	A	mg/L	2.3526	2.3526		2.5	0	0	0.0012530	0.05	225	94%	90	110	0%	
Phosphorus	A	mg/L	2.674	2.674		2.5	0	0	0.0425464	0.1	360	107%	90	110	0%	
Potassium	A	mg/L	24.851	24.851		25	0	0	0.0854754	1	900	99%	90	110	0%	
Selenium	A	mg/L	2.3861	2.3861		2.5	0	0	0.0234201	0.1	225	95%	90	110	0%	
Silicon	A	mg/L	5.1701	5.1701		5	0	0	0.0487685	0.1	450	103%	90	110	0%	
Silver	A	mg/L	0.9491	0.9491		1	0	0	0.0055813	0.01	2	95%	90	110	0%	
Sodium	A	mg/L	25.95	25.95		25	0	0	0.1131395	1	450	104%	90	110	0%	
Strontium	A	mg/L	2.3202	2.3202		2.5	0	0	0.0002417	0.1	18	93%	90	110	0%	
Tellurium	A	mg/L	2.4574	2.4574		2.5	0	0	0.0301968	0.1	90	98%	90	110	0%	
Thallium	A	mg/L	2.4341	2.4341		2.5	0	0	0.0116401	0.5	225	97%	90	110	0%	
Tin	A	mg/L	2.649	2.649		2.5	0	0	0.0081865	0.1	225	106%	90	110	0%	
Titanium	A	mg/L	2.5802	2.5802		2.5	0	0	0.002716	0.01	225	103%	90	110	0%	
Uranium	A	mg/L	2.2843	2.2843		2.5	0	0	0.1154022	0.1154022	900	91%	90	110	0%	
Vanadium	A	mg/L	2.617	2.617		2.5	0	0	0.0036660	0.1	225	105%	90	110	0%	
Zinc	A	mg/L	2.5239	2.5239		2.5	0	0	0.0023364	0.01	90	101%	90	110	0%	
Silica	C	mg/L	11.0598779	11.0598779		10.7	0	0	0.1043257	0.21392	100	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685585	CCV	ICP-200.7-W-D	CCV		2/6/2018 7:38:15	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	11.0598779	11.0598779		10.7	0	0	0.1043257	0.21392	0	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685586	CCB	ICP-200.7-W-D	CCB		2/6/2018 7:41:57	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00082	0.00082		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.0082	-0.0082		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	-0.00337	-0.00337		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00068	0.00068		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00033	0.00033		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.004	0.004		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00075	0.00075		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.01121	0.01121		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00027	0.00027		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00126	0.00126		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00059	0.00059		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00644	0.00644		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.00048	0.00048		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00371	-0.00371		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	-0.00016	-0.00016		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00798	0.00798		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00079	0.00079		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	-0.00011	-0.00011		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00151	0.00151		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00024	-0.00024		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.00119	-0.00119		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.00693	0.00693		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.01687	0.01687		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.00707	0.00707		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00099	-0.00099		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0781	0.0781		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00073	0.00073		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01534	0.01534		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00207	0.00207		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685586	CCB	ICP-200.7-W-D	CCB		2/6/2018 7:41:57	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00161	0.00161		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00015	0.00015		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-0.02517	-0.02517		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00006	-0.00006		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.0003	0.0003		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.01512414	0.01512414		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.01512414	0.01512414		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685587	Blank	ICP-200.7-W-D	ICAL		2/6/2018 7:45:50	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	Cts/S	0.36442	0.36442		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Antimony	A	Cts/S	1.971	1.971		0	0	0	0.0356182	0.05	225	0%	0	0	0%	
Arsenic	A	Cts/S	-0.17332	-0.17332		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	Cts/S	26.7	26.7		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	Cts/S	14.533	14.533		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	Cts/S	7.3833	7.3833		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	Cts/S	2.6354	2.6354		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	Cts/S	5.901	5.901		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	Cts/S	-0.30887	-0.30887		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	Cts/S	-2.6732	-2.6732		0	0	0	0.0033639	0.02	450	0%	0	0	0%	
Copper	A	Cts/S	10.856	10.856		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	Cts/S	3.8833	3.8833		0	0	0	0.0189485	0.1	90	0%	0	0	0%	
Iron	A	Cts/S	-2.45	-2.45		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lead	A	Cts/S	3.0584	3.0584		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Lithium	A	Cts/S	61.093	61.093		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	Cts/S	16.483	16.483		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	Cts/S	-0.41667	-0.41667		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Mercury	A	Cts/S	0.93105	0.93105		0	0	0	0.0100947	0.02	45	0%	0	0	0%	
Molybdenum	A	Cts/S	1.7799	1.7799		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Nickel	A	Cts/S	0.36886	0.36886		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	Cts/S	0.17999	0.17999		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	Cts/S	51.796	51.796		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	Cts/S	1.3955	1.3955		0	0	0	0.0234201	0.1	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685587	Blank	ICP-200.7-W-D	ICAL		2/6/2018 7:45:50	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	Cts/S	19.9	19.9		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silver	A	Cts/S	-2.65	-2.65		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	Cts/S	118.5	118.5		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	Cts/S	36.367	36.367		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tellurium	A	Cts/S	-5.964	-5.964		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	Cts/S	-0.55107	-0.55107		0	0	0	0.0116401	0.5	225	0%	0	0	0%	
Tin	A	Cts/S	-0.36442	-0.36442		0	0	0	0.0081865	0.1	225	0%	0	0	0%	
Titanium	A	Cts/S	149.42	149.42		0	0	0	0.002716	0.01	225	0%	0	0	0%	
Uranium	A	Cts/S	21.933	21.933		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	Cts/S	7.2333	7.2333		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	Cts/S	9.8393	9.8393		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	42.57008	42.57008		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685588	CalibStd-1	ICP-200.7-W-D	ICAL		2/6/2018 7:49:43	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	Cts/S	95032	95032		0	0	0	0.1071422	1	180	0%	0	0	0%	
Iron	A	Cts/S	9238.9	9238.9		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lithium	A	Cts/S	47785	47785		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	Cts/S	229290	229290		0	0	0	0.0116555	1	180	0%	0	0	0%	
Phosphorus	A	Cts/S	630.3	630.3		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	Cts/S	33402	33402		0	0	0	0.0854754	1	900	0%	0	0	0%	
Sodium	A	Cts/S	148500	148500		0	0	0	0.1131395	1	450	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685589	CalibStd-2	ICP-200.7-W-D	ICAL		2/6/2018 7:53:31	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	Cts/S	1151.9	1151.9		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Barium	A	Cts/S	618780	618780		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Chromium	A	Cts/S	6998	6998		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Copper	A	Cts/S	12484	12484		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	Cts/S	2874.8	2874.8		0	0	0	0.0189485	0.1	90	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685589	CalibStd-2	ICP-200.7-W-D	ICAL		2/6/2018 7:53:31	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Mercury	A	Cts/S	82.506	82.506		0	0	0	0.0100947	0.02	45	0%	0	0	0%	
Nickel	A	Cts/S	7030.8	7030.8		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Silver	A	Cts/S	535.24	535.24		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Tellurium	A	Cts/S	616.69	616.69		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	Cts/S	539.74	539.74		0	0	0	0.0116401	0.5	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685590	CalibStd-3	ICP-200.7-W-D	ICAL		2/6/2018 7:57:21	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	Cts/S	578.24	578.24		0	0	0	0.0356182	0.05	225	0%	0	0	0%	
Arsenic	A	Cts/S	520.92	520.92		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Beryllium	A	Cts/S	295690	295690		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	Cts/S	11237	11237		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	Cts/S	10183	10183		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Cobalt	A	Cts/S	6016.2	6016.2		0	0	0	0.0033639	0.02	450	0%	0	0	0%	
Lead	A	Cts/S	1096.8	1096.8		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Manganese	A	Cts/S	55810	55810		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	Cts/S	3393.4	3393.4		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Selenium	A	Cts/S	342.66	342.66		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	Cts/S	4657.5	4657.5		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Strontium	A	Cts/S	1030300	1030300		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tin	A	Cts/S	953.81	953.81		0	0	0	0.0081865	0.1	225	0%	0	0	0%	
Titanium	A	Cts/S	53352	53352		0	0	0	0.002716	0.01	225	0%	0	0	0%	
Vanadium	A	Cts/S	14885	14885		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	Cts/S	12348	12348		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	9963.324	9963.324		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685591	CalibStd-4	ICP-200.7-W-D	ICAL		2/6/2018 8:01:12	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	Cts/S	1067.1	1067.1		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685592	CCV	ICP-200.7-W-D	CCV		2/6/2018 8:05:05	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.513	2.513		2.5	0	0	0.0066084	0.1	18	101%	90	110	0%	
Antimony	A	mg/L	2.5448	2.5448		2.5	0	0	0.0356182	0.05	225	102%	90	110	0%	
Arsenic	A	mg/L	2.5471	2.5471		2.5	0	0	0.0231651	0.1	225	102%	90	110	0%	
Barium	A	mg/L	2.5545	2.5545		2.5	0	0	0.0003929	0.1	18	102%	90	110	0%	
Beryllium	A	mg/L	1.2723	1.2723		1.25	0	0	0.0002318	0.01	22.5	102%	90	110	0%	
Boron	A	mg/L	2.5366	2.5366		2.5	0	0	0.0080048	0.1	450	101%	90	110	0%	
Cadmium	A	mg/L	2.485	2.485		2.5	0	0	0.0010328	0.01	90	99%	90	110	0%	
Calcium	A	mg/L	26.194	26.194		25	0	0	0.1071422	1	180	105%	90	110	0%	
Chromium	A	mg/L	2.5295	2.5295		2.5	0	0	0.0010626	0.05	225	101%	90	110	0%	
Cobalt	A	mg/L	2.4714	2.4714		2.5	0	0	0.0033639	0.02	450	99%	90	110	0%	
Copper	A	mg/L	2.5153	2.5153		2.5	0	0	0.0048764	0.01	225	101%	90	110	0%	
Gold	A	mg/L	2.4772	2.4772		2.5	0	0	0.0189485	0.1	90	99%	90	110	0%	
Iron	A	mg/L	2.602	2.602		2.5	0	0	0.0250321	0.0250321	360	104%	90	110	0%	
Lead	A	mg/L	2.4665	2.4665		2.5	0	0	0.0187623	0.05	900	99%	90	110	0%	
Lithium	A	mg/L	1.3019	1.3019		1.25	0	0	0.0059040	0.1	22.5	104%	90	110	0%	
Magnesium	A	mg/L	26.152	26.152		25	0	0	0.0116555	1	180	105%	90	110	0%	
Manganese	A	mg/L	2.4961	2.4961		2.5	0	0	0.0010649	0.01	45	100%	90	110	0%	
Mercury	A	mg/L	1.0209	1.0209		1	0	0	0.0100947	0.02	45	102%	90	110	0%	
Molybdenum	A	mg/L	2.5308	2.5308		2.5	0	0	0.0031266	0.1	225	101%	90	110	0%	
Nickel	A	mg/L	2.4908	2.4908		2.5	0	0	0.0012530	0.05	225	100%	90	110	0%	
Phosphorus	A	mg/L	2.5497	2.5497		2.5	0	0	0.0425464	0.1	360	102%	90	110	0%	
Potassium	A	mg/L	25.989	25.989		25	0	0	0.0854754	1	900	104%	90	110	0%	
Selenium	A	mg/L	2.5113	2.5113		2.5	0	0	0.0234201	0.1	225	100%	90	110	0%	
Silicon	A	mg/L	5.139	5.139		5	0	0	0.0487685	0.1	450	103%	90	110	0%	
Silver	A	mg/L	1.0174	1.0174		1	0	0	0.0055813	0.01	2	102%	90	110	0%	
Sodium	A	mg/L	25.9	25.9		25	0	0	0.1131395	1	450	104%	90	110	0%	
Strontium	A	mg/L	2.5307	2.5307		2.5	0	0	0.0002417	0.1	18	101%	90	110	0%	
Tellurium	A	mg/L	2.5277	2.5277		2.5	0	0	0.0301968	0.1	90	101%	90	110	0%	
Thallium	A	mg/L	2.4918	2.4918		2.5	0	0	0.0116401	0.5	225	100%	90	110	0%	
Tin	A	mg/L	2.478	2.478		2.5	0	0	0.0081865	0.1	225	99%	90	110	0%	
Titanium	A	mg/L	2.5357	2.5357		2.5	0	0	0.002716	0.01	225	101%	90	110	0%	
Uranium	A	mg/L	2.5252	2.5252		2.5	0	0	0.1154022	0.1154022	900	101%	90	110	0%	
Vanadium	A	mg/L	2.5595	2.5595		2.5	0	0	0.0036660	0.1	225	102%	90	110	0%	
Zinc	A	mg/L	2.4961	2.4961		2.5	0	0	0.0023364	0.01	90	100%	90	110	0%	
Silica	C	mg/L	10.9933488	10.9933488		10.7	0	0	0.1043257	0.21392	100	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685592	CCV	ICP-200.7-W-D	CCV		2/6/2018 8:05:05	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	10.9933488	10.9933488		10.7	0	0	0.1043257	0.21392	0	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685593	CCB	ICP-200.7-W-D	CCB		2/6/2018 8:08:48	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00174	0.00174		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.00555	-0.00555		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.0001	0.0001		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00059	0.00059		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00028	0.00028		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00255	0.00255		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00075	0.00075		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00606	0.00606		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00066	0.00066		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00101	0.00101		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	-0.00181	-0.00181		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00661	0.00661		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.00234	0.00234		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00502	-0.00502		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00017	0.00017		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00551	0.00551		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00041	0.00041		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00076	0.00076		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00191	0.00191		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0.00057	0.00057		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.00142	-0.00142		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	-0.00089	-0.00089		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	-0.00407	-0.00407		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.0065	0.0065		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00213	-0.00213		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0769	0.0769		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.0005	0.0005		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01024	0.01024		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00279	0.00279		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685593	CCB	ICP-200.7-W-D	CCB		2/6/2018 8:08:48	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00296	0.00296		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00073	0.00073		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	0.00976	0.00976		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00057	-0.00057		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00069	0.00069		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.0139048	0.0139048		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.0139048	0.0139048		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685594	B18020177-001	200.7.8-W-T	SD		2/6/2018 8:12:43	5	118186	2/5/2018 8:0	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0171	0		0	0	0.07625	0.23437	0.23437	18	0%	0	0		
Antimony	A	mg/L	0.002398	0		0	0	0	0.1217232	0.1217232	225	0%	0	0		
Arsenic	A	mg/L	-0.000526	0		0	0	0	0.0761654	0.0761654	225	0%	0	0		
Barium	A	mg/L	0.01333	0.06665		0	0	0.05694	0.0602852	0.0602852	18	0%	0	0		N
Beryllium	A	mg/L	0.000008	0		0	0	0	0.0161167	0.0161167	22.5	0%	0	0		
Boron	A	mg/L	0.00851	0		0	0	0.04148	0.0579724	0.0579724	450	0%	0	0		
Cadmium	A	mg/L	0.000704	0		0	0	0	0.0098662	0.0098662	90	0%	0	0		
Calcium	A	mg/L	11.3982	56.991		0	0	53.823	1.2865372	1.2865372	180	0%	0	0	6%	
Chromium	A	mg/L	0.008096	0.04048		0	0	0	0.008194	0.008194	225	0%	0	0		N
Cobalt	A	mg/L	0.000046	0		0	0	0	0.0140284	0.0140284	450	0%	0	0		
Copper	A	mg/L	0.00058	0		0	0	0	0.0309141	0.0309141	225	0%	0	0		
Gold	A	mg/L	-0.002432	0		0	0	0	0.0752006	0.0752006	90	0%	0	0		
Iron	A	mg/L	0.021972	0.10986		0	0	0.08907	0.0185099	0.02	360	0%	0	0		N
Lead	A	mg/L	-0.004428	0		0	0	0	0.1098356	0.1098356	900	0%	0	0		
Lithium	A	mg/L	0.002076	0		0	0	0.0085	0.0379404	0.1	22.5	0%	0	0		
Magnesium	A	mg/L	3.5182	17.591		0	0	16.487	0.1421794	1	4500	0%	0	0	6%	
Manganese	A	mg/L	0.00552	0.0276		0	0	0.02541	0.0038606	0.0038606	45	0%	0	0		N
Molybdenum	A	mg/L	-0.000272	0		0	0	0	0.0144067	0.0144067	225	0%	0	0		
Nickel	A	mg/L	-0.000104	0		0	0	0	0.0056141	0.0056141	225	0%	0	0		
Phosphorus	A	mg/L	-0.000498	0		0	0	0	0.092727	0.1	360	0%	0	0		
Potassium	A	mg/L	0.32012	1.6006		0	0	1.4631	0.3387317	1	900	0%	0	0		N
Selenium	A	mg/L	-0.00187	0		0	0	0	0.1282357	0.1282357	225	0%	0	0		
Silicon	A	mg/L	0.66008	3.3004		0	0	3.1166	0.1374369	0.1374369	450	0%	0	0	6%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685594	B18020177-001	200.7.8-W-T	SD		2/6/2018 8:12:43	5	118186	2/5/2018 8:0	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	-0.00004	0		0	0	0	0.5670484	0.5670484	2	0%	0	0		
Sodium	A	mg/L	5.6334	28.167		0	0	25.486	6.6864470	6.6864470	4500	0%	0	0		N
Strontium	A	mg/L	0.08329	0.41645		0	0	0.37215	0.0014989	0.01	18	0%	0	0	11%	R
Tellurium	A	mg/L	0.019812	0		0	0	0	0.1371814	0.1371814	90	0%	0	0		
Thallium	A	mg/L	-0.00138	0		0	0	0	0.0428973	0.0428973	225	0%	0	0		
Tin	A	mg/L	-0.000562	0		0	0	0	0.0454493	0.05	225	0%	0	0		
Titanium	A	mg/L	0.000462	0		0	0	0.003	0.0130035	0.0130035	225	0%	0	0		
Uranium	A	mg/L	0.02103	0		0	0	0	0.6167589	0.6167589	900	0%	0	0		
Vanadium	A	mg/L	-0.001032	0		0	0	0	0.0210553	0.0210553	225	0%	0	0		
Zinc	A	mg/L	0.000736	0		0	0	0	0.0127272	0.0127272	90	0%	0	0		
Calcium as CaCO3	C	mg/L	0.56991	2.84955		0	0	2.69115	0.0643269	0.0643269	5	0%	0	0	6%	
Calcium, meq	C	meq/L		2.84955		0	0	2.69115	0.0643269	0.0643269	5	0%	0	0	6%	
Magnesium, meq	C	meq/L	0.28954786	1.4477393		0	0	1.3568801	0.0117014	0.0823	5	0%	0	0	6%	
Molybdenum as MoO3	C	mg/L	-0.000408	0		0	0	0	0.02161	0.02161	2	0%	0	0		
Phosphorus as PO4	C	mg/L	-0.0015289	0		0	0	0	0.2846718	0.307	5	0%	0	0		
Potassium, meq	C	meq/L	0.00818867	0.04094335		0	0	0.0374261	0.0086648	0.02558	5	0%	0	0		N
Silica	C	mg/L	1.41204314	7.06021568		0	0	6.6670307	0.294005	0.294005	1000	0%	0	0	6%	
Silicon as SiO2	C	mg/L	1.41204314	7.06021568		0	0	6.6670307	0.294005	0.294005	1000	0%	0	0	6%	
Sodium, meq	C	meq/L	0.2450529	1.2252645		0	0	1.108641	0.2908604	0.2908604	0	0%	0	0		N
Uranium, Activity	C	pCi/L	14.23731	0		0	0	0	417.54575	417.54575	0	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685595	B18020177-001	200.7.8-W-T	PDS		2/6/2018 8:16:34	1.03	118186	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.58592233	4.7235		5.15	0.07625	0	0.0482802	0.0482802	18	90%	70	130	0%	
Antimony	A	mg/L	0.96220388	0.99107		1.03	0	0	0.025075	0.025075	225	96%	70	130	0%	
Arsenic	A	mg/L	0.97213592	1.0013		1.03	0	0	0.0156901	0.0156901	225	97%	70	130	0%	
Barium	A	mg/L	1.02864078	1.0595		1.03	0.05694	0	0.0124187	0.05	18	97%	70	130	0%	
Beryllium	A	mg/L	0.47417476	0.4884		0.515	0	0	0.0033200	0.0033200	22.5	95%	70	130	0%	
Boron	A	mg/L	1.0115534	1.0419		1.03	0.04148	0	0.0119423	0.05	450	97%	70	130	0%	
Cadmium	A	mg/L	0.47024272	0.48435		0.515	0	0	0.0020324	0.0020324	90	94%	70	130	0%	
Calcium	A	mg/L	101.330097	104.37		51.5	53.823	0	0.2650267	1	180	98%	70	130	0%	
Chromium	A	mg/L	0.93338835	0.96139		1.03	0	0	0.001688	0.005	225	93%	70	130	0%	
Cobalt	A	mg/L	0.90366990	0.93078		1.03	0	0	0.0028898	0.005	450	90%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685595	B18020177-001	200.7.8-W-T	PDS		2/6/2018 8:16:34	1.03	118186	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	A	mg/L	0.94296117	0.97125		1.03	0	0	0.0063683	0.0063683	225	94%	70	130	0%	
Gold	A	mg/L	0.90525243	0.93241		1.03	0	0	0.0154913	0.0154913	90	91%	70	130	0%	
Iron	A	mg/L	4.97601942	5.1253		5.15	0.08907	0	0.0038130	0.02	360	98%	70	130	0%	
Lead	A	mg/L	0.91425243	0.94168		1.03	0	0	0.0226261	0.0226261	900	91%	70	130	0%	
Lithium	A	mg/L	1.00242718	1.0325		1.03	0.0085	0	0.0078157	0.1	22.5	99%	70	130	0%	
Magnesium	A	mg/L	65.6456311	67.615		51.5	16.487	0	0.029289	1	4500	99%	70	130	0%	
Manganese	A	mg/L	4.71873786	4.8603		5.15	0.02541	0	0.0007953	0.001	45	94%	70	130	0%	
Molybdenum	A	mg/L	0.94483495	0.97318		1.03	0	0	0.0029678	0.0029678	225	94%	70	130	0%	
Nickel	A	mg/L	0.90112621	0.92816		1.03	0	0	0.0011565	0.005	225	90%	70	130	0%	
Phosphorus	A	mg/L	9.66213592	9.952		10.3	0	0	0.0191018	0.1	360	97%	70	130	0%	
Potassium	A	mg/L	51.0165049	52.547		51.5	1.4631	0	0.0697787	1	900	99%	70	130	0%	
Selenium	A	mg/L	0.92937864	0.95726		1.03	0	0	0.0264166	0.0264166	225	93%	70	130	0%	
Silicon	A	mg/L	12.8165049	13.201		10.3	3.1166	0	0.028312	0.1	450	98%	70	130	0%	
Silver	A	mg/L	0.38248544	0.39396		0.515	0	0	0.116812	0.116812	2	76%	70	130	0%	
Sodium	A	mg/L	75.415534	77.678		51.5	25.486	0	1.3774081	1.3774081	4500	101%	70	130	0%	
Strontium	A	mg/L	1.34456311	1.3849		1.03	0.37215	0	0.0003088	0.01	18	98%	70	130	0%	
Tellurium	A	mg/L	0.9628835	0.99177		1.03	0	0	0.0282594	0.0282594	90	96%	70	130	0%	
Thallium	A	mg/L	0.90660194	0.9338		1.03	0	0	0.0088368	0.0088368	225	91%	70	130	0%	
Tin	A	mg/L	0.92780583	0.95564		1.03	0	0	0.0093626	0.05	225	93%	70	130	0%	
Titanium	A	mg/L	0.98291262	1.0124		1.03	0.003	0	0.0026787	0.005	225	98%	70	130	0%	
Uranium	A	mg/L	0.95854369	0.9873		0	0	0	0.1270523	0.1270523	900	0%	70	130	0%	
Vanadium	A	mg/L	0.97330097	1.0025		1.03	0	0	0.0043374	0.01	225	97%	70	130	0%	
Zinc	A	mg/L	0.94560194	0.97397		1.03	0	0	0.0026218	0.01	90	95%	70	130	0%	
Calcium as CaCO3	C	mg/L	5.06650485	5.2185		0	2.69115	0	0.0132513	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		5.2185		0	2.69115	0	0.0132513	0.05	5	0%	0	0	0%	
Magnesium, meq	C	meq/L	5.40263544	5.5647145		0	1.3568801	0	0.0024105	0.0823	5	0%	0	0	0%	
Molybdenum as MoO3	C	mg/L	1.41725243	1.45977		0	0	0	0.0044517	0.0044517	2	0%	0	0	0%	
Molybdenum as MoO4	C	mg/L		1.6203447		0	0	0	0.0049413	0.0049413	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	29.6627573	30.55264		0	0	0	0.0586424	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	1.30500219	1.34415226		0	0.0374261	0	0.0017849	0.02558	5	0%	0	0	0%	
Silica	C	mg/L	27.4170672	28.2395792		22.042	6.6670307	0	0.0605650	0.21392	1000	98%	70	130	0%	
Silicon as SiO2	C	mg/L	27.4170672	28.2395792		22.042	6.6670307	0	0.0605650	0.21392	1000	98%	70	130	0%	
Sodium, meq	C	meq/L	3.28057573	3.378993		0	1.108641	0	0.0599173	0.0599173	0	0%	0	0	0%	
Uranium, Activity	C	pCi/L	648.934078	668.4021		0	0	0	86.014424	86.014424	0	0%	0	0	0%	
Uranium, U3O8	C	mg/L		1.16402694		0	0	0	0.1497947	0.1497947	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685596	B18020177-001	200.7.8-W-T	MS3		2/6/2018 8:20:26	1	118186	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5171	2.5171		2.5	0.07625	0	0.046874	0.046874	18	98%	70	130	0%	
Antimony	A	mg/L	0.49573	0.49573		0.5	0	0	0.0243446	0.0243446	225	99%	70	130	0%	
Arsenic	A	mg/L	0.53671	0.53671		0.5	0	0	0.0152331	0.0152331	225	107%	70	130	0%	
Barium	A	mg/L	0.54939	0.54939		0.5	0.05694	0	0.0120570	0.05	18	98%	70	130	0%	
Beryllium	A	mg/L	0.24007	0.24007		0.25	0	0	0.0032233	0.0032233	22.5	96%	70	130	0%	
Boron	A	mg/L	0.52347	0.52347		0.5	0.04148	0	0.0115945	0.05	450	96%	70	130	0%	
Cadmium	A	mg/L	0.24135	0.24135		0.25	0	0	0.0019732	0.0019732	90	97%	70	130	0%	
Calcium	A	mg/L	80.277	80.277		25	53.823	0	0.2573074	1	180	106%	70	130	0%	
Chromium	A	mg/L	0.48121	0.48121		0.5	0	0	0.0016388	0.005	225	96%	70	130	0%	
Cobalt	A	mg/L	0.46719	0.46719		0.5	0	0	0.0028057	0.005	450	93%	70	130	0%	
Copper	A	mg/L	0.47807	0.47807		0.5	0	0	0.0061828	0.0061828	225	96%	70	130	0%	
Gold	A	mg/L	0.41746	0.41746		0.5	0	0	0.0150401	0.0150401	90	83%	70	130	0%	
Iron	A	mg/L	2.5892	2.5892		2.5	0.08907	0	0.003702	0.02	360	100%	70	130	0%	
Lead	A	mg/L	0.48047	0.48047		0.5	0	0	0.0219671	0.0219671	900	96%	70	130	0%	
Lithium	A	mg/L	0.50675	0.50675		0.5	0.0085	0	0.0075881	0.1	22.5	100%	70	130	0%	
Magnesium	A	mg/L	42.692	42.692		25	16.487	0	0.0284359	1	4500	105%	70	130	0%	
Manganese	A	mg/L	2.4199	2.4199		2.5	0.02541	0	0.0007721	0.001	45	96%	70	130	0%	
Molybdenum	A	mg/L	0.48169	0.48169		0.5	0	0	0.0028813	0.0028813	225	96%	70	130	0%	
Nickel	A	mg/L	0.4686	0.4686		0.5	0	0	0.0011228	0.005	225	94%	70	130	0%	
Phosphorus	A	mg/L	4.9311	4.9311		5	0	0	0.0185454	0.1	360	99%	70	130	0%	
Potassium	A	mg/L	26.506	26.506		25	1.4631	0	0.0677463	1	900	100%	70	130	0%	
Selenium	A	mg/L	0.47659	0.47659		0.5	0	0	0.0256471	0.0256471	225	95%	70	130	0%	
Silicon	A	mg/L	8.1432	8.1432		5	3.1166	0	0.0274874	0.1	450	101%	70	130	0%	
Silver	A	mg/L	0.0399	0		0.05	0	0	0.1134097	0.1134097	2	0%	70	130	0%	S
Sodium	A	mg/L	51.726	51.726		25	25.486	0	1.3372894	1.3372894	4500	105%	70	130	0%	
Strontium	A	mg/L	0.88184	0.88184		0.5	0.37215	0	0.0002998	0.01	18	102%	70	130	0%	
Tellurium	A	mg/L	0.49957	0.49957		0.5	0	0	0.0274363	0.0274363	90	100%	70	130	0%	
Thallium	A	mg/L	0.46474	0.46474		0.5	0	0	0.0085795	0.0085795	225	93%	70	130	0%	
Tin	A	mg/L	0.47826	0.47826		0.5	0	0	0.0090899	0.05	225	96%	70	130	0%	
Titanium	A	mg/L	0.4943	0.4943		0.5	0.003	0	0.0026007	0.005	225	98%	70	130	0%	
Uranium	A	mg/L	0.57241	0.57241		0.5	0	0	0.1233518	0.1233518	900	114%	70	130	0%	
Vanadium	A	mg/L	0.494	0.494		0.5	0	0	0.0042111	0.01	225	99%	70	130	0%	
Zinc	A	mg/L	0.48599	0.48599		0.5	0	0	0.0025454	0.01	90	97%	70	130	0%	
Calcium as CaCO3	C	mg/L	4.01385	4.01385		0	2.69115	0	0.0128654	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		4.01385		0	2.69115	0	0.0128654	0.05	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685596	B18020177-001	200.7.8-W-T	MS3		2/6/2018 8:20:26	1	118186	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium, meq	C	meq/L	3.5135516	3.5135516		0	1.3568801	0	0.0023403	0.0823	5	0%	0	0	0%	
Molybdenum as MoO3	C	mg/L	0.722535	0.722535		0	0	0	0.004322	0.004322	2	0%	0	0	0%	
Molybdenum as MoO4	C	mg/L		0.80201385		0	0	0	0.0047974	0.0047974	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	15.138477	15.138477		0	0	0	0.0569344	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	0.67802348	0.67802348		0	0.0374261	0	0.001733	0.02558	5	0%	0	0	0%	
Silica	C	mg/L	17.4199334	17.4199334		10.696	6.6670307	0	0.058801	0.21392	1000	101%	70	130	0%	
Silicon as SiO2	C	mg/L	17.4199334	17.4199334		10.696	6.6670307	0	0.058801	0.21392	1000	101%	70	130	0%	
Sodium, meq	C	meq/L	2.250081	2.250081		0	1.108641	0	0.0581721	0.0581721	0	0%	0	0	0%	
Uranium, Activity	C	pCi/L	387.52157	387.52157		0	0	0	83.50915	83.50915	0	0%	0	0	0%	
Uranium, U3O8	C	mg/L		0.67487153		0	0	0	0.1454318	0.1454318	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685597	B18020177-001	200.7.8-W-T	MSD3		2/6/2018 8:24:01	1	118186	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.4875	2.4875		2.5	0.07625	2.5171	0.046874	0.046874	18	96%	70	130	1%	
Antimony	A	mg/L	0.49443	0.49443		0.5	0	0.49573	0.0243446	0.0243446	225	99%	70	130	0%	
Arsenic	A	mg/L	0.53318	0.53318		0.5	0	0.53671	0.0152331	0.0152331	225	107%	70	130	1%	
Barium	A	mg/L	0.54506	0.54506		0.5	0.05694	0.54939	0.0120570	0.05	18	98%	70	130	1%	
Beryllium	A	mg/L	0.23714	0.23714		0.25	0	0.24007	0.0032233	0.0032233	22.5	95%	70	130	1%	
Boron	A	mg/L	0.51713	0.51713		0.5	0.04148	0.52347	0.0115945	0.05	450	95%	70	130	1%	
Cadmium	A	mg/L	0.24002	0.24002		0.25	0	0.24135	0.0019732	0.0019732	90	96%	70	130	1%	
Calcium	A	mg/L	78.977	78.977		25	53.823	80.277	0.2573074	1	180	101%	70	130	2%	
Chromium	A	mg/L	0.47724	0.47724		0.5	0	0.48121	0.0016388	0.005	225	95%	70	130	1%	
Cobalt	A	mg/L	0.46463	0.46463		0.5	0	0.46719	0.0028057	0.005	450	93%	70	130	1%	
Copper	A	mg/L	0.47415	0.47415		0.5	0	0.47807	0.0061828	0.0061828	225	95%	70	130	1%	
Gold	A	mg/L	0.40489	0.40489		0.5	0	0.41746	0.0150401	0.0150401	90	81%	70	130	3%	
Iron	A	mg/L	2.5514	2.5514		2.5	0.08907	2.5892	0.003702	0.02	360	98%	70	130	1%	
Lead	A	mg/L	0.46268	0.46268		0.5	0	0.48047	0.0219671	0.0219671	900	93%	70	130	4%	
Lithium	A	mg/L	0.49914	0.49914		0.5	0.0085	0.50675	0.0075881	0.1	22.5	98%	70	130	2%	
Magnesium	A	mg/L	42.251	42.251		25	16.487	42.692	0.0284359	1	4500	103%	70	130	1%	
Manganese	A	mg/L	2.3995	2.3995		2.5	0.02541	2.4199	0.0007721	0.001	45	95%	70	130	1%	
Molybdenum	A	mg/L	0.48607	0.48607		0.5	0	0.48169	0.0028813	0.0028813	225	97%	70	130	1%	
Nickel	A	mg/L	0.46708	0.46708		0.5	0	0.4686	0.0011228	0.005	225	93%	70	130	0%	
Phosphorus	A	mg/L	4.8843	4.8843		5	0	4.9311	0.0185454	0.1	360	98%	70	130	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685597	B18020177-001	200.7.8-W-T	MSD3		2/6/2018 8:24:01	1	118186	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium	A	mg/L	26.194	26.194		25	1.4631	26.506	0.0677463	1	900	99%	70	130	1%	
Selenium	A	mg/L	0.47194	0.47194		0.5	0	0.47659	0.0256471	0.0256471	225	94%	70	130	1%	
Silicon	A	mg/L	8.1292	8.1292		5	3.1166	8.1432	0.0274874	0.1	450	100%	70	130	0%	
Silver	A	mg/L	0.0379	0		0.05	0	0	0.1134097	0.1134097	2	0%	70	130		S
Sodium	A	mg/L	50.908	50.908		25	25.486	51.726	1.3372894	1.3372894	4500	102%	70	130	2%	
Strontium	A	mg/L	0.87035	0.87035		0.5	0.37215	0.88184	0.0002998	0.01	18	100%	70	130	1%	
Tellurium	A	mg/L	0.49843	0.49843		0.5	0	0.49957	0.0274363	0.0274363	90	100%	70	130	0%	
Thallium	A	mg/L	0.46618	0.46618		0.5	0	0.46474	0.0085795	0.0085795	225	93%	70	130	0%	
Tin	A	mg/L	0.48486	0.48486		0.5	0	0.47826	0.0090899	0.05	225	97%	70	130	1%	
Titanium	A	mg/L	0.4961	0.4961		0.5	0.003	0.4943	0.0026007	0.005	225	99%	70	130	0%	
Uranium	A	mg/L	0.59024	0.59024		0.5	0	0.57241	0.1233518	0.1233518	900	118%	70	130	3%	
Vanadium	A	mg/L	0.48956	0.48956		0.5	0	0.494	0.0042111	0.01	225	98%	70	130	1%	
Zinc	A	mg/L	0.4808	0.4808		0.5	0	0.48599	0.0025454	0.01	90	96%	70	130	1%	
Calcium as CaCO3	C	mg/L	3.94885	3.94885		0	2.69115	4.01385	0.0128654	0.05	5	0%	0	0	2%	
Calcium, meq	C	meq/L		3.94885		0	2.69115	4.01385	0.0128654	0.05	5	0%	0	0	2%	
Magnesium, meq	C	meq/L	3.4772573	3.4772573		0	1.3568801	3.5135516	0.0023403	0.0823	5	0%	0	0	1%	
Molybdenum as MoO3	C	mg/L	0.729105	0.729105		0	0	0.722535	0.004322	0.004322	2	0%	0	0	1%	
Molybdenum as MoO4	C	mg/L		0.80930655		0	0	0.8020139	0.0047974	0.0047974	5	0%	0	0	1%	
Phosphorus as PO4	C	mg/L	14.994801	14.994801		0	0	15.138477	0.0569344	0.307	5	0%	0	0	1%	
Potassium, meq	C	meq/L	0.67004252	0.67004252		0	0.0374261	0.6780235	0.001733	0.02558	5	0%	0	0	1%	
Silica	C	mg/L	17.3899846	17.3899846		10.696	6.6670307	17.419933	0.058801	0.21392	1000	100%	70	130	0%	
Silicon as SiO2	C	mg/L	17.3899846	17.3899846		10.696	6.6670307	17.419933	0.058801	0.21392	1000	100%	70	130	0%	
Sodium, meq	C	meq/L	2.214498	2.214498		0	1.108641	2.250081	0.0581721	0.0581721	0	0%	0	0	2%	
Uranium, Activity	C	pCi/L	399.59248	399.59248		0	0	387.52157	83.50915	83.50915	0	0%	0	0	3%	
Uranium, U3O8	C	mg/L		0.69589310		0	0	0.6748715	0.1454318	0.1454318	0	0%	0	0	3%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685598	B18020177-002	200.7.8-W-T	SAMP		2/6/2018 8:27:35	1	118186	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.06349	0.06349		0	0	0	0.0120570	0.05	18	0%	0	0	0%	
Boron	A	mg/L	0.04106	0.04106		0	0	0	0.0115945	0.05	450	0%	0	0	0%	J
Calcium	A	mg/L	55.708	55.708		0	0	0	0.2573074	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00013	0		0	0	0	0.0016388	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.0008	0		0	0	0	0.0028057	0.005	450	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685598	B18020177-002	200.7.8-W-T	SAMP		2/6/2018 8:27:35	1	118186	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	mg/L	0.09771	0.09771		0	0	0	0.003702	0.02	360	0%	0	0	0%	
Lithium	A	mg/L	0.00904	0.00904		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	17.066	17.066		0	0	0	0.0284359	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.02616	0.02616		0	0	0	0.0007721	0.001	45	0%	0	0	0%	
Nickel	A	mg/L	0.00018	0		0	0	0	0.0011228	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.01201	0		0	0	0	0.0185454	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	1.507	1.507		0	0	0	0.0677463	1	900	0%	0	0	0%	
Silicon	A	mg/L	3.1124	3.1124		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Strontium	A	mg/L	0.40223	0.40223		0	0	0	0.0002998	0.01	18	0%	0	0	0%	
Tin	A	mg/L	-0.00042	0		0	0	0	0.0090899	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00377	0.00377		0	0	0	0.0026007	0.005	225	0%	0	0	0%	J
Vanadium	A	mg/L	0.00027	0		0	0	0	0.0042111	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00072	0		0	0	0	0.0025454	0.01	90	0%	0	0	0%	
Aluminum	B	mg/L	0.0895	0.0895		0	0	0	0.046874	0.046874	18	0%	0	0	0%	DL
Antimony	B	mg/L	0.00372	0		0	0	0	0.0243446	0.0243446	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00112	0		0	0	0	0.0152331	0.0152331	225	0%	0	0	0%	DL
Beryllium	B	mg/L	0.00009	0		0	0	0	0.0032233	0.0032233	22.5	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00086	0		0	0	0	0.0019732	0.0019732	90	0%	0	0	0%	DL
Copper	B	mg/L	0.00043	0		0	0	0	0.0061828	0.0061828	225	0%	0	0	0%	DL
Gold	B	mg/L	-0.0056	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	DL
Lead	B	mg/L	0.00067	0		0	0	0	0.0219671	0.0219671	900	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00148	0		0	0	0	0.0028813	0.0028813	225	0%	0	0	0%	DL
Molybdenum as MoO3	B	mg/L	0.00222	0		0	0	0	0.004322	0.004322	2	0%	0	0	0%	DL
Selenium	B	mg/L	-0.01494	0		0	0	0	0.0256471	0.0256471	225	0%	0	0	0%	DL
Sodium	B	mg/L	25.624	25.624		0	0	0	1.3372894	1.3372894	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	1.114644	1.114644		0	0	0	0.0581721	0.0581721	0	0%	0	0	0%	DL
Tellurium	B	mg/L	0.00595	0		0	0	0	0.0274363	0.0274363	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00486	0		0	0	0	0.0085795	0.0085795	225	0%	0	0	0%	DL
Uranium	B	mg/L	-0.021	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	-14.217	0		0	0	0	83.50915	83.50915	0	0%	0	0	0%	DL
Calcium as CaCO3	C	mg/L	2.7854	2.7854		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		2.7854		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Magnesium, meq	C	meq/L	1.4045318	1.4045318		0	0	0	0.0023403	0.0823	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	0.0368707	0		0	0	0	0.0569344	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	0.03854906	0.03854906		0	0	0	0.001733	0.02558	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685598	B18020177-002	200.7.8-W-T	SAMP		2/6/2018 8:27:35	1	118186	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silica	C	mg/L	6.65804608	6.65804608		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	6.65804608	6.65804608		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685599	B18020219-001	200.7.8-W-T	SAMP		2/6/2018 8:31:25	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.00025	0		0	0	0	0.0120570	0.05	18	0%	0	0	0%	
Boron	A	mg/L	0.41459	0.41459		0	0	0	0.0115945	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	0.4965	0.4965		0	0	0	0.2573074	1	180	0%	0	0	0%	J
Chromium	A	mg/L	0.0005	0		0	0	0	0.0016388	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00027	0		0	0	0	0.0028057	0.005	450	0%	0	0	0%	
Lithium	A	mg/L	0.00116	0		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.03559	0.03559		0	0	0	0.0087454	1	180	0%	0	0	0%	J
Manganese	A	mg/L	0.00463	0.00463		0	0	0	0.0007721	0.001	45	0%	0	0	0%	
Nickel	A	mg/L	0.00019	0		0	0	0	0.0011228	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.00469	0		0	0	0	0.0185454	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.1365	0.1365		0	0	0	0.0677463	1	900	0%	0	0	0%	J
Silicon	A	mg/L	4.7129	4.7129		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Strontium	A	mg/L	0.00094	0.00094		0	0	0	0.0002998	0.01	18	0%	0	0	0%	J
Tin	A	mg/L	0.00263	0		0	0	0	0.0090899	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.0004	0		0	0	0	0.0026007	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.00061	0		0	0	0	0.0042111	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00142	0		0	0	0	0.0025454	0.01	90	0%	0	0	0%	
Aluminum	B	mg/L	0.00708	0		0	0	0	0.046874	0.046874	18	0%	0	0	0%	DL
Antimony	B	mg/L	-0.00009	0		0	0	0	0.0243446	0.0243446	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.0053	0		0	0	0	0.0152331	0.0152331	225	0%	0	0	0%	DL
Beryllium	B	mg/L	0.00001	0		0	0	0	0.0032233	0.0032233	22.5	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00007	0		0	0	0	0.0019732	0.0019732	90	0%	0	0	0%	DL
Copper	B	mg/L	0.00699	0.00699		0	0	0	0.0061828	0.0061828	225	0%	0	0	0%	DL
Gold	B	mg/L	-0.0018	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	DL
Lead	B	mg/L	0.00043	0		0	0	0	0.0219671	0.0219671	900	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00439	0.00439		0	0	0	0.0028813	0.0028813	225	0%	0	0	0%	DL
Molybdenum as MoO3	B	mg/L	0.006585	0.006585		0	0	0	0.004322	0.004322	2	0%	0	0	0%	DL
Selenium	B	mg/L	-0.00887	0		0	0	0	0.0256471	0.0256471	225	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685599	B18020219-001	200.7.8-W-T	SAMP		2/6/2018 8:31:25	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Sodium	B	mg/L	154.88	154.88		0	0	0	1.3372894	1.3372894	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	6.73728	6.73728		0	0	0	0.0581721	0.0581721	0	0%	0	0	0%	DL
Tellurium	B	mg/L	0.0081	0		0	0	0	0.0274363	0.0274363	90	0%	0	0	0%	DL
Thallium	B	mg/L	0.00048	0		0	0	0	0.0085795	0.0085795	225	0%	0	0	0%	DL
Uranium	B	mg/L	0.07137	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	48.31749	0		0	0	0	83.50915	83.50915	0	0%	0	0	0%	DL
Calcium as CaCO3	C	mg/L	0.024825	0.024825		0	0	0	0.0128654	0.05	5	0%	0	0	0%	J
Calcium, meq	C	meq/L		0.024825		0	0	0	0.0128654	0.05	5	0%	0	0	0%	J
Magnesium, meq	C	meq/L	0.00292906	0.00292906		0	0	0	0.0007198	0.0823	5	0%	0	0	0%	J
Molybdenum as MoO4	C	mg/L		0.00730935		0	0	0	0.0047974	0.0047974	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	0.0143983	0		0	0	0	0.0569344	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00349167	0.00349167		0	0	0	0.001733	0.02558	5	0%	0	0	0%	J
Silica	C	mg/L	10.0818357	10.0818357		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	10.0818357	10.0818357		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685600	B18020219-002	200.7.8-W-T	SAMP		2/6/2018 8:35:27	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.03085	0.03085		0	0	0	0.0120570	0.05	18	0%	0	0	0%	J
Boron	A	mg/L	0.4236	0.4236		0	0	0	0.0115945	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	19.978	19.978		0	0	0	0.2573074	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00002	0		0	0	0	0.0016388	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00017	0		0	0	0	0.0028057	0.005	450	0%	0	0	0%	
Iron	A	mg/L	0.01474	0.01474		0	0	0	0.003702	0.02	360	0%	0	0	0%	J
Lithium	A	mg/L	0.03061	0.03061		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	17.266	17.266		0	0	0	0.0284359	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.00123	0.00123		0	0	0	0.0007721	0.001	45	0%	0	0	0%	
Nickel	A	mg/L	0.00288	0.00288		0	0	0	0.0011228	0.005	225	0%	0	0	0%	J
Phosphorus	A	mg/L	0.0064	0		0	0	0	0.0185454	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	2.0364	2.0364		0	0	0	0.0677463	1	900	0%	0	0	0%	
Silicon	A	mg/L	4.4791	4.4791		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Strontium	A	mg/L	0.3103	0.3103		0	0	0	0.0002998	0.01	18	0%	0	0	0%	
Tin	A	mg/L	-0.00172	0		0	0	0	0.0090899	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00045	0		0	0	0	0.0026007	0.005	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685600	B18020219-002	200.7.8-W-T	SAMP		2/6/2018 8:35:27	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	0.00074	0		0	0	0	0.0042111	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.03575	0.03575		0	0	0	0.0025454	0.01	90	0%	0	0	0%	
Aluminum	B	mg/L	0.00584	0		0	0	0	0.046874	0.046874	18	0%	0	0	0%	DL
Antimony	B	mg/L	-0.00456	0		0	0	0	0.0243446	0.0243446	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00386	0		0	0	0	0.0152331	0.0152331	225	0%	0	0	0%	DL
Beryllium	B	mg/L	0	0		0	0	0	0.0032233	0.0032233	22.5	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00112	0		0	0	0	0.0019732	0.0019732	90	0%	0	0	0%	DL
Copper	B	mg/L	0.07635	0.07635		0	0	0	0.0061828	0.0061828	225	0%	0	0	0%	DL
Gold	B	mg/L	-0.0006	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	DL
Lead	B	mg/L	-0.00525	0		0	0	0	0.0219671	0.0219671	900	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00478	0.00478		0	0	0	0.0028813	0.0028813	225	0%	0	0	0%	DL
Molybdenum as MoO3	B	mg/L	0.00717	0.00717		0	0	0	0.004322	0.004322	2	0%	0	0	0%	DL
Selenium	B	mg/L	-0.00591	0		0	0	0	0.0256471	0.0256471	225	0%	0	0	0%	DL
Sodium	B	mg/L	99.329	99.329		0	0	0	1.3372894	1.3372894	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	4.3208115	4.3208115		0	0	0	0.0581721	0.0581721	0	0%	0	0	0%	DL
Tellurium	B	mg/L	0.00678	0		0	0	0	0.0274363	0.0274363	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.0026	0		0	0	0	0.0085795	0.0085795	225	0%	0	0	0%	DL
Uranium	B	mg/L	0.04015	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	27.18155	0		0	0	0	83.50915	83.50915	0	0%	0	0	0%	DL
Calcium as CaCO3	C	mg/L	0.9989	0.9989		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		0.9989		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Magnesium, meq	C	meq/L	1.4209918	1.4209918		0	0	0	0.0023403	0.0823	5	0%	0	0	0%	
Molybdenum as MoO4	C	mg/L		0.0079587		0	0	0	0.0047974	0.0047974	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	0.019648	0		0	0	0	0.0569344	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	0.05209111	0.05209111		0	0	0	0.001733	0.02558	5	0%	0	0	0%	
Silica	C	mg/L	9.58169072	9.58169072		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	9.58169072	9.58169072		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685601	B18020224-001	200.7.8-W-T	SAMP		2/6/2018 8:39:24	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.03423	0.03423		0	0	0	0.0120570	0.05	18	0%	0	0	0%	J
Boron	A	mg/L	0.06309	0.06309		0	0	0	0.0115945	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	74.017	74.017		0	0	0	0.2573074	1	180	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685601	B18020224-001	200.7.8-W-T	SAMP		2/6/2018 8:39:24	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.00061	0		0	0	0	0.0016388	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	-0.00081	0		0	0	0	0.0028057	0.005	450	0%	0	0	0%	
Iron	A	mg/L	0.0334	0.0334		0	0	0	0.003702	0.02	360	0%	0	0	0%	
Lithium	A	mg/L	0.00932	0.00932		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	30.041	30.041		0	0	0	0.0284359	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.00027	0		0	0	0	0.0007721	0.001	45	0%	0	0	0%	
Nickel	A	mg/L	-0.00075	0		0	0	0	0.0011228	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.02268	0.02268		0	0	0	0.0185454	0.1	360	0%	0	0	0%	J
Potassium	A	mg/L	2.4962	2.4962		0	0	0	0.0677463	1	900	0%	0	0	0%	
Silicon	A	mg/L	9.394	9.394		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Strontium	A	mg/L	0.22893	0.22893		0	0	0	0.0002998	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00186	0		0	0	0	0.0090899	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00159	0		0	0	0	0.0026007	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.00407	0		0	0	0	0.0042111	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.02925	0.02925		0	0	0	0.0025454	0.01	90	0%	0	0	0%	
Aluminum	B	mg/L	0.00804	0		0	0	0	0.046874	0.046874	18	0%	0	0	0%	DL
Antimony	B	mg/L	-0.00094	0		0	0	0	0.0243446	0.0243446	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00449	0		0	0	0	0.0152331	0.0152331	225	0%	0	0	0%	DL
Beryllium	B	mg/L	0.00001	0		0	0	0	0.0032233	0.0032233	22.5	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00068	0		0	0	0	0.0019732	0.0019732	90	0%	0	0	0%	DL
Copper	B	mg/L	0.0352	0.0352		0	0	0	0.0061828	0.0061828	225	0%	0	0	0%	DL
Gold	B	mg/L	-0.00298	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	DL
Lead	B	mg/L	-0.0059	0		0	0	0	0.0219671	0.0219671	900	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00064	0		0	0	0	0.0028813	0.0028813	225	0%	0	0	0%	DL
Molybdenum as MoO3	B	mg/L	0.00096	0		0	0	0	0.004322	0.004322	2	0%	0	0	0%	DL
Selenium	B	mg/L	-0.00954	0		0	0	0	0.0256471	0.0256471	225	0%	0	0	0%	DL
Sodium	B	mg/L	32.595	32.595		0	0	0	1.3372894	1.3372894	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	1.4178825	1.4178825		0	0	0	0.0581721	0.0581721	0	0%	0	0	0%	DL
Tellurium	B	mg/L	0.01915	0		0	0	0	0.0274363	0.0274363	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00339	0		0	0	0	0.0085795	0.0085795	225	0%	0	0	0%	DL
Uranium	B	mg/L	-0.00246	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	-1.66542	0		0	0	0	83.50915	83.50915	0	0%	0	0	0%	DL
Calcium as CaCO3	C	mg/L	3.70085	3.70085		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		3.70085		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Magnesium, meq	C	meq/L	2.4723743	2.4723743		0	0	0	0.0023403	0.0823	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685601	B18020224-001	200.7.8-W-T	SAMP		2/6/2018 8:39:24	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Phosphorus as PO4	C	mg/L	0.0696276	0.0696276		0	0	0	0.0569344	0.307	5	0%	0	0	0%	J
Potassium, meq	C	meq/L	0.0638528	0.0638528		0	0	0	0.001733	0.02558	5	0%	0	0	0%	
Silica	C	mg/L	20.0956448	20.0956448		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	20.0956448	20.0956448		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685602	B18020224-002	200.7.8-W-T	SAMP		2/6/2018 8:43:14	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.00321	0		0	0	0	0.0120570	0.05	18	0%	0	0	0%	
Boron	A	mg/L	0.04558	0.04558		0	0	0	0.0115945	0.05	450	0%	0	0	0%	J
Calcium	A	mg/L	18.961	18.961		0	0	0	0.2573074	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00086	0		0	0	0	0.0016388	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	-0.00004	0		0	0	0	0.0028057	0.005	450	0%	0	0	0%	
Iron	A	mg/L	0.00462	0.00462		0	0	0	0.003702	0.02	360	0%	0	0	0%	J
Lithium	A	mg/L	0.00306	0		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	13.979	13.979		0	0	0	0.0284359	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.00011	0		0	0	0	0.0007721	0.001	45	0%	0	0	0%	
Nickel	A	mg/L	-0.00072	0		0	0	0	0.0011228	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.19156	0.19156		0	0	0	0.0185454	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	5.2238	5.2238		0	0	0	0.0677463	1	900	0%	0	0	0%	
Silicon	A	mg/L	39.899	39.899		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Strontium	A	mg/L	0.22644	0.22644		0	0	0	0.0002998	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00132	0		0	0	0	0.0090899	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00037	0		0	0	0	0.0026007	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.05203	0.05203		0	0	0	0.0042111	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00079	0		0	0	0	0.0025454	0.01	90	0%	0	0	0%	
Aluminum	B	mg/L	0.00566	0		0	0	0	0.046874	0.046874	18	0%	0	0	0%	DL
Antimony	B	mg/L	0.00023	0		0	0	0	0.0243446	0.0243446	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00537	0		0	0	0	0.0152331	0.0152331	225	0%	0	0	0%	DL
Beryllium	B	mg/L	0.00003	0		0	0	0	0.0032233	0.0032233	22.5	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00022	0		0	0	0	0.0019732	0.0019732	90	0%	0	0	0%	DL
Copper	B	mg/L	0.00169	0		0	0	0	0.0061828	0.0061828	225	0%	0	0	0%	DL
Gold	B	mg/L	-0.00312	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	DL
Lead	B	mg/L	0.00088	0		0	0	0	0.0219671	0.0219671	900	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685602	B18020224-002	200.7.8-W-T	SAMP		2/6/2018 8:43:14	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	B	mg/L	0.00022	0		0	0	0	0.0028813	0.0028813	225	0%	0	0	0%	DL
Molybdenum as MoO3	B	mg/L	0.00033	0		0	0	0	0.004322	0.004322	2	0%	0	0	0%	DL
Selenium	B	mg/L	-0.01723	0		0	0	0	0.0256471	0.0256471	225	0%	0	0	0%	DL
Sodium	B	mg/L	18.016	18.016		0	0	0	1.3372894	1.3372894	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	0.783696	0.783696		0	0	0	0.0581721	0.0581721	0	0%	0	0	0%	DL
Tellurium	B	mg/L	0.0138	0		0	0	0	0.0274363	0.0274363	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00192	0		0	0	0	0.0085795	0.0085795	225	0%	0	0	0%	DL
Uranium	B	mg/L	0.01901	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	12.86977	0		0	0	0	83.50915	83.50915	0	0%	0	0	0%	DL
Calcium as CaCO3	C	mg/L	0.94805	0.94805		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		0.94805		0	0	0	0.0128654	0.05	5	0%	0	0	0%	
Magnesium, meq	C	meq/L	1.1504717	1.1504717		0	0	0	0.0023403	0.0823	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	0.5880892	0.5880892		0	0	0	0.0569344	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	0.13362480	0.13362480		0	0	0	0.001733	0.02558	5	0%	0	0	0%	
Silica	C	mg/L	85.3519408	85.3519408		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	85.3519408	85.3519408		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685603	B18020224-003	200.7.8-W-T	SAMP		2/6/2018 8:47:02	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.0003	0		0	0	0	0.0120570	0.05	18	0%	0	0	0%	
Boron	A	mg/L	0.04114	0.04114		0	0	0	0.0115945	0.05	450	0%	0	0	0%	J
Calcium	A	mg/L	0.63421	0.63421		0	0	0	0.2573074	1	180	0%	0	0	0%	J
Chromium	A	mg/L	0.00071	0		0	0	0	0.0016388	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00008	0		0	0	0	0.0028057	0.005	450	0%	0	0	0%	
Iron	A	mg/L	0.09831	0.09831		0	0	0	0.003702	0.02	360	0%	0	0	0%	
Lithium	A	mg/L	0.03298	0.03298		0	0	0	0.0075881	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	-0.00936	0		0	0	0	0.0284359	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.0003	0		0	0	0	0.0007721	0.001	45	0%	0	0	0%	
Nickel	A	mg/L	-0.0017	0		0	0	0	0.0011228	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.06	0.06		0	0	0	0.0185454	0.1	360	0%	0	0	0%	J
Potassium	A	mg/L	2.1015	2.1015		0	0	0	0.0677463	1	900	0%	0	0	0%	
Silicon	A	mg/L	39.691	39.691		0	0	0	0.0274874	0.1	450	0%	0	0	0%	
Strontium	A	mg/L	0.00039	0.00039		0	0	0	0.0002998	0.01	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685603	B18020224-003	200.7.8-W-T	SAMP		2/6/2018 8:47:02	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00165	0		0	0	0	0.0090899	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00184	0		0	0	0	0.0026007	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.00241	0		0	0	0	0.0042111	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00265	0.00265		0	0	0	0.0025454	0.01	90	0%	0	0	0%	J
Aluminum	B	mg/L	0.07747	0.07747		0	0	0	0.046874	0.046874	18	0%	0	0	0%	DL
Antimony	B	mg/L	-0.00278	0		0	0	0	0.0243446	0.0243446	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.01151	0		0	0	0	0.0152331	0.0152331	225	0%	0	0	0%	DL
Beryllium	B	mg/L	0.00004	0		0	0	0	0.0032233	0.0032233	22.5	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00049	0		0	0	0	0.0019732	0.0019732	90	0%	0	0	0%	DL
Copper	B	mg/L	-0.00074	0		0	0	0	0.0061828	0.0061828	225	0%	0	0	0%	DL
Gold	B	mg/L	-0.00441	0		0	0	0	0.0150401	0.0150401	90	0%	0	0	0%	DL
Lead	B	mg/L	0.00279	0		0	0	0	0.0219671	0.0219671	900	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00608	0.00608		0	0	0	0.0028813	0.0028813	225	0%	0	0	0%	DL
Molybdenum as MoO3	B	mg/L	0.00912	0.00912		0	0	0	0.004322	0.004322	2	0%	0	0	0%	DL
Selenium	B	mg/L	-0.0065	0		0	0	0	0.0256471	0.0256471	225	0%	0	0	0%	DL
Sodium	B	mg/L	32.007	32.007		0	0	0	1.3372894	1.3372894	4500	0%	0	0	0%	
Sodium, meq	B	meq/L	1.3923045	1.3923045		0	0	0	0.0581721	0.0581721	0	0%	0	0	0%	DL
Tellurium	B	mg/L	0.01307	0		0	0	0	0.0274363	0.0274363	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00256	0		0	0	0	0.0085795	0.0085795	225	0%	0	0	0%	DL
Uranium	B	mg/L	-0.00721	0		0	0	0	0.1233518	0.1233518	900	0%	0	0	0%	DL
Uranium, Activity	B	pCi/L	-4.88117	0		0	0	0	83.50915	83.50915	0	0%	0	0	0%	DL
Calcium as CaCO3	C	mg/L	0.0317105	0.0317105		0	0	0	0.0128654	0.05	5	0%	0	0	0%	J
Calcium, meq	C	meq/L		0.0317105		0	0	0	0.0128654	0.05	5	0%	0	0	0%	J
Magnesium, meq	C	meq/L	-0.0007703	0		0	0	0	0.0023403	0.0823	5	0%	0	0	0%	
Molybdenum as MoO4	C	mg/L		0.0101232		0	0	0	0.0047974	0.0047974	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	0.1842	0.1842		0	0	0	0.0569344	0.307	5	0%	0	0	0%	J
Potassium, meq	C	meq/L	0.05375637	0.05375637		0	0	0	0.001733	0.02558	5	0%	0	0	0%	
Silica	C	mg/L	84.9069872	84.9069872		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	84.9069872	84.9069872		0	0	0	0.058801	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685604	CCV	ICP-200.7-W-D	CCV		2/6/2018 8:50:54	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685604	CCV	ICP-200.7-W-D	CCV		2/6/2018 8:50:54	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.497	2.497		2.5	0	0	0.0066084	0.1	18	100%	90	110	0%	
Antimony	A	mg/L	2.5109	2.5109		2.5	0	0	0.0356182	0.05	225	100%	90	110	0%	
Arsenic	A	mg/L	2.5294	2.5294		2.5	0	0	0.0231651	0.1	225	101%	90	110	0%	
Barium	A	mg/L	2.4743	2.4743		2.5	0	0	0.0003929	0.1	18	99%	90	110	0%	
Beryllium	A	mg/L	1.2629	1.2629		1.25	0	0	0.0002318	0.01	22.5	101%	90	110	0%	
Boron	A	mg/L	2.5056	2.5056		2.5	0	0	0.0080048	0.1	450	100%	90	110	0%	
Cadmium	A	mg/L	2.4377	2.4377		2.5	0	0	0.0010328	0.01	90	98%	90	110	0%	
Calcium	A	mg/L	25.799	25.799		25	0	0	0.1071422	1	180	103%	90	110	0%	
Chromium	A	mg/L	2.4932	2.4932		2.5	0	0	0.0010626	0.05	225	100%	90	110	0%	
Cobalt	A	mg/L	2.4235	2.4235		2.5	0	0	0.0033639	0.02	450	97%	90	110	0%	
Copper	A	mg/L	2.4534	2.4534		2.5	0	0	0.0048764	0.01	225	98%	90	110	0%	
Gold	A	mg/L	2.4245	2.4245		2.5	0	0	0.0189485	0.1	90	97%	90	110	0%	
Iron	A	mg/L	2.5923	2.5923		2.5	0	0	0.0250321	0.0250321	360	104%	90	110	0%	
Lead	A	mg/L	2.4598	2.4598		2.5	0	0	0.0187623	0.05	900	98%	90	110	0%	
Lithium	A	mg/L	1.2557	1.2557		1.25	0	0	0.0059040	0.1	22.5	100%	90	110	0%	
Magnesium	A	mg/L	25.359	25.359		25	0	0	0.0116555	1	180	101%	90	110	0%	
Manganese	A	mg/L	2.4534	2.4534		2.5	0	0	0.0010649	0.01	45	98%	90	110	0%	
Mercury	A	mg/L	1.0065	1.0065		1	0	0	0.0100947	0.02	45	101%	90	110	0%	
Molybdenum	A	mg/L	2.5113	2.5113		2.5	0	0	0.0031266	0.1	225	100%	90	110	0%	
Nickel	A	mg/L	2.4318	2.4318		2.5	0	0	0.0012530	0.05	225	97%	90	110	0%	
Phosphorus	A	mg/L	2.5318	2.5318		2.5	0	0	0.0425464	0.1	360	101%	90	110	0%	
Potassium	A	mg/L	25.17	25.17		25	0	0	0.0854754	1	900	101%	90	110	0%	
Selenium	A	mg/L	2.4362	2.4362		2.5	0	0	0.0234201	0.1	225	97%	90	110	0%	
Silicon	A	mg/L	5.0829	5.0829		5	0	0	0.0487685	0.1	450	102%	90	110	0%	
Silver	A	mg/L	0.98433	0.98433		1	0	0	0.0055813	0.01	2	98%	90	110	0%	
Sodium	A	mg/L	25.26	25.26		25	0	0	0.1131395	1	450	101%	90	110	0%	
Strontium	A	mg/L	2.4376	2.4376		2.5	0	0	0.0002417	0.1	18	98%	90	110	0%	
Tellurium	A	mg/L	2.4766	2.4766		2.5	0	0	0.0301968	0.1	90	99%	90	110	0%	
Thallium	A	mg/L	2.4436	2.4436		2.5	0	0	0.0116401	0.5	225	98%	90	110	0%	
Tin	A	mg/L	2.4858	2.4858		2.5	0	0	0.0081865	0.1	225	99%	90	110	0%	
Titanium	A	mg/L	2.5064	2.5064		2.5	0	0	0.002716	0.01	225	100%	90	110	0%	
Uranium	A	mg/L	2.4438	2.4438		2.5	0	0	0.1154022	0.1154022	900	98%	90	110	0%	
Vanadium	A	mg/L	2.5302	2.5302		2.5	0	0	0.0036660	0.1	225	101%	90	110	0%	
Zinc	A	mg/L	2.4626	2.4626		2.5	0	0	0.0023364	0.01	90	99%	90	110	0%	
Silica	C	mg/L	10.8733397	10.8733397		10.7	0	0	0.1043257	0.21392	100	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685604	CCV	ICP-200.7-W-D	CCV		2/6/2018 8:50:54	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	10.8733397	10.8733397		10.7	0	0	0.1043257	0.21392	0	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685605	CCB	ICP-200.7-W-D	CCB		2/6/2018 8:54:36	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00006	0.00006		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.00137	-0.00137		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00505	0.00505		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00058	0.00058		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00032	0.00032		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00219	0.00219		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00069	0.00069		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00605	0.00605		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00131	0.00131		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00007	0.00007		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00092	0.00092		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00855	0.00855		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.00326	0.00326		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.0037	-0.0037		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00091	0.00091		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00582	0.00582		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00039	0.00039		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	-0.00004	-0.00004		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00115	0.00115		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00004	-0.00004		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.00025	0.00025		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.00218	0.00218		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	-0.00557	-0.00557		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.00474	0.00474		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00036	-0.00036		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0839	0.0839		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.0005	0.0005		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.01262	0.01262		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00151	0.00151		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685605	CCB	ICP-200.7-W-D	CCB		2/6/2018 8:54:36	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.0014	0.0014		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00049	0.00049		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	0.02962	0.02962		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00018	0.00018		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00046	0.00046		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.01013981	0.01013981		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.01013981	0.01013981		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685606	B18020224-004	200.7.8-W-T	SAMP		2/6/2018 8:58:31	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.00783	0		0	0	0	0.0241141	0.05	18	0%	0	0	0%	
Boron	A	mg/L	0.01065	0		0	0	0	0.0231889	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	24.186	48.372		0	0	0	0.5146149	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00042	0		0	0	0	0.0032776	0.005	225	0%	0	0	0%	
Iron	A	mg/L	0.00455	0.0091		0	0	0	0.007404	0.02	360	0%	0	0	0%	J
Lithium	A	mg/L	0.00155	0		0	0	0	0.0151762	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	8.2349	16.4698		0	0	0	0.0568718	1	4500	0%	0	0	0%	
Nickel	A	mg/L	-0.00021	0		0	0	0	0.0022456	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.00073	0		0	0	0	0.0370908	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.23505	0.4701		0	0	0	0.1354927	1	900	0%	0	0	0%	J
Silicon	A	mg/L	1.5511	3.1022		0	0	0	0.0549747	0.1	450	0%	0	0	0%	
Strontium	A	mg/L	0.03199	0.06398		0	0	0	0.0005995	0.01	18	0%	0	0	0%	
Tin	A	mg/L	-0.00167	0		0	0	0	0.0181797	0.05	225	0%	0	0	0%	
Vanadium	A	mg/L	-0.00028	0		0	0	0	0.0084221	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00071	0		0	0	0	0.0050909	0.01	90	0%	0	0	0%	
Aluminum	B	mg/L	0.00486	0		0	0	0	0.093748	0.093748	18	0%	0	0	0%	D
Antimony	B	mg/L	-0.00188	0		0	0	0	0.0486893	0.0486893	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.00461	0		0	0	0	0.0304662	0.0304662	225	0%	0	0	0%	D
Beryllium	B	mg/L	0.00003	0		0	0	0	0.0064467	0.0064467	22.5	0%	0	0	0%	D
Cadmium	B	mg/L	0.00063	0		0	0	0	0.0039465	0.0039465	90	0%	0	0	0%	D
Cobalt	B	mg/L	0.00086	0		0	0	0	0.0056113	0.0056113	450	0%	0	0	0%	D
Copper	B	mg/L	-0.00015	0		0	0	0	0.0123657	0.0123657	225	0%	0	0	0%	D
Gold	B	mg/L	0.00152	0		0	0	0	0.0300802	0.0300802	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685606	B18020224-004	200.7.8-W-T	SAMP		2/6/2018 8:58:31	1	118186	2/5/2018 8:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	B	mg/L	-0.00259	0		0	0	0	0.0439342	0.0439342	900	0%	0	0	0%	D
Manganese	B	mg/L	0	0		0	0	0	0.0015443	0.0015443	45	0%	0	0	0%	D
Molybdenum	B	mg/L	-0.00085	0		0	0	0	0.0057627	0.0057627	225	0%	0	0	0%	D
Molybdenum as MoO3	B	mg/L	-0.001275	0		0	0	0	0.008644	0.008644	2	0%	0	0	0%	D
Selenium	B	mg/L	-0.009	0		0	0	0	0.0512943	0.0512943	225	0%	0	0	0%	D
Sodium	B	mg/L	1.3019	0		0	0	0	2.6745788	2.6745788	4500	0%	0	0	0%	D
Sodium, meq	B	meq/L	0.05663265	0		0	0	0	0.1163442	0.1163442	0	0%	0	0	0%	D
Tellurium	B	mg/L	0.00896	0		0	0	0	0.0548726	0.0548726	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.00269	0		0	0	0	0.0171589	0.0171589	225	0%	0	0	0%	D
Titanium	B	mg/L	0.00024	0		0	0	0	0.0052014	0.0052014	225	0%	0	0	0%	
Uranium	B	mg/L	0.01356	0		0	0	0	0.2467035	0.2467035	900	0%	0	0	0%	D
Uranium, Activity	B	pCi/L	9.18012	0		0	0	0	167.0183	167.0183	0	0%	0	0	0%	D
Calcium as CaCO3	C	mg/L	1.2093	2.4186		0	0	0	0.0257307	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		2.4186		0	0	0	0.0257307	0.05	5	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.67773227	1.35546454		0	0	0	0.0046805	0.0823	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	0.0022411	0		0	0	0	0.1138687	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00601258	0.01202516		0	0	0	0.0034659	0.02558	5	0%	0	0	0%	J
Silica	C	mg/L	3.31811312	6.63622624		0	0	0	0.117602	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	3.31811312	6.63622624		0	0	0	0.117602	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685607	B18020224-004	200.7.8-W-T	SD		2/6/2018 9:02:22	5	118186	2/5/2018 8:2	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.002288	0		0	0	0	0.4687399	0.4687399	18	0%	0	0		
Antimony	A	mg/L	-0.00133	0		0	0	0	0.2434465	0.2434465	225	0%	0	0		
Arsenic	A	mg/L	0.004222	0		0	0	0	0.1523308	0.1523308	225	0%	0	0		
Barium	A	mg/L	0.001538	0		0	0	0	0.1205703	0.1205703	18	0%	0	0		
Beryllium	A	mg/L	0.000004	0		0	0	0	0.0322334	0.0322334	22.5	0%	0	0		
Boron	A	mg/L	0.002008	0		0	0	0	0.1159447	0.1159447	450	0%	0	0		
Cadmium	A	mg/L	0.000336	0		0	0	0	0.0197325	0.0197325	90	0%	0	0		
Calcium	A	mg/L	4.924	49.24		0	0	48.372	2.5730743	2.5730743	180	0%	0	0	2%	
Chromium	A	mg/L	0.007672	0.07672		0	0	0	0.016388	0.016388	225	0%	0	0		N
Cobalt	A	mg/L	0.000244	0		0	0	0	0.0280567	0.0280567	450	0%	0	0		
Copper	A	mg/L	-0.0016	0		0	0	0	0.0618283	0.0618283	225	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685607	B18020224-004	200.7.8-W-T	SD		2/6/2018 9:02:22	5	118186	2/5/2018 8:2	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Gold	A	mg/L	-0.004962	0		0	0	0	0.1504012	0.1504012	90	0%	0	0		
Iron	A	mg/L	0.003998	0.03998		0	0	0.0091	0.0370198	0.0370198	360	0%	0	0		N
Lead	A	mg/L	0.000958	0		0	0	0	0.2196711	0.2196711	900	0%	0	0		
Lithium	A	mg/L	0.00095	0		0	0	0	0.0758808	0.1	22.5	0%	0	0		
Magnesium	A	mg/L	1.65688	16.5688		0	0	16.4698	0.2843589	1	4500	0%	0	0	1%	
Manganese	A	mg/L	0.000152	0		0	0	0	0.0077213	0.0077213	45	0%	0	0		
Molybdenum	A	mg/L	-0.000498	0		0	0	0	0.0288133	0.0288133	225	0%	0	0		
Nickel	A	mg/L	-0.000098	0		0	0	0	0.0112282	0.0112282	225	0%	0	0		
Phosphorus	A	mg/L	-0.001072	0		0	0	0	0.1854539	0.1854539	360	0%	0	0		
Potassium	A	mg/L	0.052062	0		0	0	0.4701	0.6774634	1	900	0%	0	0		
Selenium	A	mg/L	-0.013558	0		0	0	0	0.2564714	0.2564714	225	0%	0	0		
Silicon	A	mg/L	0.33552	3.3552		0	0	3.1022	0.2748737	0.2748737	450	0%	0	0	8%	
Silver	A	mg/L	0.000234	0		0	0	0	1.1340968	1.1340968	2	0%	0	0		
Sodium	A	mg/L	0.31546	0		0	0	0	13.372894	13.372894	4500	0%	0	0		
Strontium	A	mg/L	0.006458	0.06458		0	0	0.06398	0.0029977	0.01	18	0%	0	0	1%	
Tellurium	A	mg/L	0.012536	0		0	0	0	0.2743629	0.2743629	90	0%	0	0		
Thallium	A	mg/L	-0.003138	0		0	0	0	0.0857946	0.0857946	225	0%	0	0		
Tin	A	mg/L	0.00253	0		0	0	0	0.0908987	0.0908987	225	0%	0	0		
Titanium	A	mg/L	-0.000162	0		0	0	0	0.0260070	0.0260070	225	0%	0	0		
Uranium	A	mg/L	-0.006552	0		0	0	0	1.2335177	1.2335177	900	0%	0	0		
Vanadium	A	mg/L	-0.0015	0		0	0	0	0.0421107	0.0421107	225	0%	0	0		
Zinc	A	mg/L	0.000824	0		0	0	0	0.0254544	0.0254544	90	0%	0	0		
Calcium as CaCO3	C	mg/L	0.2462	2.462		0	0	2.4186	0.1286537	0.1286537	5	0%	0	0	2%	
Calcium, meq	C	meq/L		2.462		0	0	2.4186	0.1286537	0.1286537	5	0%	0	0	2%	
Magnesium, meq	C	meq/L	0.13636122	1.36361224		0	0	1.3554645	0.0234027	0.0823	5	0%	0	0	1%	
Molybdenum as MoO3	C	mg/L	-0.000747	0		0	0	0	0.04322	0.04322	2	0%	0	0		
Phosphorus as PO4	C	mg/L	-0.0032910	0		0	0	0	0.5693435	0.5693435	5	0%	0	0		
Potassium, meq	C	meq/L	0.00133175	0		0	0	0.0120252	0.0173295	0.02558	5	0%	0	0		
Silica	C	mg/L	0.71774438	7.17744384		0	0	6.6362262	0.5880099	0.5880099	1000	0%	0	0	8%	
Silicon as SiO2	C	mg/L	0.71774438	7.17744384		0	0	6.6362262	0.5880099	0.5880099	1000	0%	0	0	8%	
Sodium, meq	C	meq/L	0.01372251	0		0	0	0	0.5817209	0.5817209	0	0%	0	0		
Uranium, Activity	C	pCi/L	-4.435704	0		0	0	0	835.0915	835.0915	0	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685608	B18020224-004	200.7.8-W-T	PDS		2/6/2018 9:06:13	1.03	118186	2/5/2018 8:2	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.63631068	9.5508		10.3	0	0	0.0965604	0.0965604	18	93%	70	130	0%	
Antimony	A	mg/L	0.95085437	1.95876		2.06	0	0	0.05015	0.05015	225	95%	70	130	0%	
Arsenic	A	mg/L	0.96652427	1.99104		2.06	0	0	0.0313801	0.0313801	225	97%	70	130	0%	
Barium	A	mg/L	0.9561068	1.96958		2.06	0	0	0.0248375	0.05	18	96%	70	130	0%	
Beryllium	A	mg/L	0.48053398	0.9899		1.03	0	0	0.0066401	0.0066401	22.5	96%	70	130	0%	
Boron	A	mg/L	0.98097087	2.0208		2.06	0	0	0.0238846	0.05	450	98%	70	130	0%	
Cadmium	A	mg/L	0.4717767	0.97186		1.03	0	0	0.0040649	0.0040649	90	94%	70	130	0%	
Calcium	A	mg/L	71.9601942	148.238		103	48.372	0	0.5300533	1	180	97%	70	130	0%	
Chromium	A	mg/L	0.94024272	1.9369		2.06	0	0	0.0033759	0.005	225	94%	70	130	0%	
Cobalt	A	mg/L	0.91074757	1.87614		2.06	0	0	0.0057797	0.0057797	450	91%	70	130	0%	
Copper	A	mg/L	0.94001942	1.93644		2.06	0	0	0.0127366	0.0127366	225	94%	70	130	0%	
Gold	A	mg/L	0.87892233	1.81058		2.06	0	0	0.0309826	0.0309826	90	88%	70	130	0%	
Iron	A	mg/L	4.94990291	10.1968		10.3	0.0091	0	0.0076261	0.02	360	99%	70	130	0%	
Lead	A	mg/L	0.94325243	1.9431		2.06	0	0	0.0452523	0.0452523	900	94%	70	130	0%	
Lithium	A	mg/L	0.97194175	2.0022		2.06	0	0	0.0156314	0.1	22.5	97%	70	130	0%	
Magnesium	A	mg/L	56.9592233	117.336		103	16.4698	0	0.0585779	1	4500	98%	70	130	0%	
Manganese	A	mg/L	4.70650485	9.6954		10.3	0	0	0.0015906	0.0015906	45	94%	70	130	0%	
Molybdenum	A	mg/L	0.94001942	1.93644		2.06	0	0	0.0059355	0.0059355	225	94%	70	130	0%	
Nickel	A	mg/L	0.95770874	1.97288		2.06	0	0	0.002313	0.005	225	96%	70	130	0%	
Phosphorus	A	mg/L	9.78446602	20.156		20.6	0	0	0.0382035	0.1	360	98%	70	130	0%	
Potassium	A	mg/L	48.8038835	100.536		103	0.4701	0	0.1395575	1	900	97%	70	130	0%	
Selenium	A	mg/L	0.90947573	1.87352		2.06	0	0	0.0528331	0.0528331	225	91%	70	130	0%	
Silicon	A	mg/L	11.0844660	22.834		20.6	3.1022	0	0.056624	0.1	450	96%	70	130	0%	
Silver	A	mg/L	0.35836893	0.73824		1.03	0	0	0.2336239	0.2336239	2	72%	70	130	0%	
Sodium	A	mg/L	50.2398058	103.494		103	0	0	2.7548162	2.7548162	4500	100%	70	130	0%	
Strontium	A	mg/L	0.97252427	2.0034		2.06	0.06398	0	0.0006175	0.01	18	94%	70	130	0%	
Tellurium	A	mg/L	0.96048544	1.9786		2.06	0	0	0.0565188	0.0565188	90	96%	70	130	0%	
Thallium	A	mg/L	0.91657282	1.88814		2.06	0	0	0.0176737	0.0176737	225	92%	70	130	0%	
Tin	A	mg/L	0.93324272	1.92248		2.06	0	0	0.0187251	0.05	225	93%	70	130	0%	
Titanium	A	mg/L	0.96440777	1.98668		2.06	0	0	0.0053574	0.0053574	225	96%	70	130	0%	
Uranium	A	mg/L	0.91982524	1.89484		0	0	0	0.2541047	0.2541047	900	0%	70	130	0%	
Vanadium	A	mg/L	0.97766990	2.014		2.06	0	0	0.0086748	0.01	225	98%	70	130	0%	
Zinc	A	mg/L	2.90543689	5.9852		2.06	0	0	0.0052436	0.01	90	291%	70	130	0%	S
Calcium as CaCO3	C	mg/L	3.59800971	7.4119		0	2.4186	0	0.0265027	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		7.4119		0	2.4186	0	0.0265027	0.05	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685608	B18020224-004	200.7.8-W-T	PDS		2/6/2018 9:06:13	1.03	118186	2/5/2018 8:2	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium, meq	C	meq/L	4.68774408	9.6567528		0	1.3554645	0	0.004821	0.0823	5	0%	0	0	0%	
Molybdenum as MoO3	C	mg/L	1.41002913	2.90466		0	0	0	0.0089033	0.0089033	2	0%	0	0	0%	
Molybdenum as MoO4	C	mg/L		3.2241726		0	0	0	0.0098827	0.0098827	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	30.0383107	61.87892		0	0	0	0.1172848	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	1.24840334	2.57171088		0	0.0120252	0	0.0035699	0.02558	5	0%	0	0	0%	
Silica	C	mg/L	23.7118897	48.8464928		44.084	6.6362262	0	0.1211300	0.21392	1000	96%	70	130	0%	
Silicon as SiO2	C	mg/L	23.7118897	48.8464928		44.084	6.6362262	0	0.1211300	0.21392	1000	96%	70	130	0%	
Sodium, meq	C	meq/L	2.18543155	4.501989		0	0	0	0.1198345	0.1198345	0	0%	0	0	0%	
Uranium, Activity	C	pCi/L	622.721689	1282.80668		0	0	0	172.02885	172.02885	0	0%	0	0	0%	
Uranium, U3O8	C	mg/L		2.23401681		0	0	0	0.2995894	0.2995894	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685609	B18020224-004	200.7.8-W-T	MS3		2/6/2018 9:09:39	1	118186	2/5/2018 8:2	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.4615	4.923		5	0	0	0.093748	0.093748	18	98%	70	130	0%	
Antimony	A	mg/L	0.51043	1.02086		1	0	0	0.0486893	0.0486893	225	102%	70	130	0%	
Arsenic	A	mg/L	0.5517	1.1034		1	0	0	0.0304662	0.0304662	225	110%	70	130	0%	
Barium	A	mg/L	0.49381	0.98762		1	0	0	0.0241141	0.05	18	99%	70	130	0%	
Beryllium	A	mg/L	0.24801	0.49602		0.5	0	0	0.0064467	0.0064467	22.5	99%	70	130	0%	
Boron	A	mg/L	0.50442	1.00884		1	0	0	0.0231889	0.05	450	101%	70	130	0%	
Cadmium	A	mg/L	0.24332	0.48664		0.5	0	0	0.0039465	0.0039465	90	97%	70	130	0%	
Calcium	A	mg/L	50.07	100.14		50	48.372	0	0.5146149	1	180	104%	70	130	0%	
Chromium	A	mg/L	0.48819	0.97638		1	0	0	0.0032776	0.005	225	98%	70	130	0%	
Cobalt	A	mg/L	0.47154	0.94308		1	0	0	0.0056113	0.0056113	450	94%	70	130	0%	
Copper	A	mg/L	0.48711	0.97422		1	0	0	0.0123657	0.0123657	225	97%	70	130	0%	
Gold	A	mg/L	0.43826	0.87652		1	0	0	0.0300802	0.0300802	90	88%	70	130	0%	
Iron	A	mg/L	2.5741	5.1482		5	0.0091	0	0.007404	0.02	360	103%	70	130	0%	
Lead	A	mg/L	0.48475	0.9695		1	0	0	0.0439342	0.0439342	900	97%	70	130	0%	
Lithium	A	mg/L	0.50485	1.0097		1	0	0	0.0151762	0.1	22.5	101%	70	130	0%	
Magnesium	A	mg/L	33.722	67.444		50	16.4698	0	0.0568718	1	4500	102%	70	130	0%	
Manganese	A	mg/L	2.4349	4.8698		5	0	0	0.0015443	0.0015443	45	97%	70	130	0%	
Molybdenum	A	mg/L	0.49792	0.99584		1	0	0	0.0057627	0.0057627	225	100%	70	130	0%	
Nickel	A	mg/L	0.4685	0.937		1	0	0	0.0022456	0.005	225	94%	70	130	0%	
Phosphorus	A	mg/L	5.0462	10.0924		10	0	0	0.0370908	0.1	360	101%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685609	B18020224-004	200.7.8-W-T	MS3		2/6/2018 9:09:39	1	118186	2/5/2018 8:2	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium	A	mg/L	25.281	50.562		50	0.4701	0	0.1354927	1	900	100%	70	130	0%	
Selenium	A	mg/L	0.46644	0.93288		1	0	0	0.0512943	0.0512943	225	93%	70	130	0%	
Silicon	A	mg/L	6.6287	13.2574		10	3.1022	0	0.0549747	0.1	450	102%	70	130	0%	
Silver	A	mg/L	0.03876	0		0.1	0	0	0.2268194	0.2268194	2	0%	70	130	0%	S
Sodium	A	mg/L	26.33	52.66		50	0	0	2.6745788	2.6745788	4500	105%	70	130	0%	
Strontium	A	mg/L	0.51876	1.03752		1	0.06398	0	0.0005995	0.01	18	97%	70	130	0%	
Tellurium	A	mg/L	0.51379	1.02758		1	0	0	0.0548726	0.0548726	90	103%	70	130	0%	
Thallium	A	mg/L	0.47634	0.95268		1	0	0	0.0171589	0.0171589	225	95%	70	130	0%	
Tin	A	mg/L	0.49587	0.99174		1	0	0	0.0181797	0.05	225	99%	70	130	0%	
Titanium	A	mg/L	0.50726	1.01452		1	0	0	0.0052014	0.0052014	225	101%	70	130	0%	
Uranium	A	mg/L	0.54116	1.08232		1	0	0	0.2467035	0.2467035	900	108%	70	130	0%	
Vanadium	A	mg/L	0.50739	1.01478		1	0	0	0.0084221	0.01	225	101%	70	130	0%	
Zinc	A	mg/L	0.49298	0.98596		1	0	0	0.0050909	0.01	90	99%	70	130	0%	
Calcium as CaCO3	C	mg/L	2.5035	5.007		0	2.4186	0	0.0257307	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		5.007		0	2.4186	0	0.0257307	0.05	5	0%	0	0	0%	
Magnesium, meq	C	meq/L	2.7753206	5.5506412		0	1.3554645	0	0.0046805	0.0823	5	0%	0	0	0%	
Molybdenum as MoO3	C	mg/L	0.74688	1.49376		0	0	0	0.008644	0.008644	2	0%	0	0	0%	
Molybdenum as MoO4	C	mg/L		1.6580736		0	0	0	0.0095948	0.0095948	5	0%	0	0	0%	
Phosphorus as PO4	C	mg/L	15.491834	30.983668		0	0	0	0.1138687	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	0.64668798	1.29337596		0	0.0120252	0	0.0034659	0.02558	5	0%	0	0	0%	
Silica	C	mg/L	14.1801150	28.3602301		21.392	6.6362262	0	0.117602	0.21392	1000	102%	70	130	0%	
Silicon as SiO2	C	mg/L	14.1801150	28.3602301		21.392	6.6362262	0	0.117602	0.21392	1000	102%	70	130	0%	
Sodium, meq	C	meq/L	1.145355	2.29071		0	0	0	0.1163442	0.1163442	0	0%	0	0	0%	
Uranium, Activity	C	pCi/L	366.36532	732.73064		0	0	0	167.0183	167.0183	0	0%	0	0	0%	
Uranium, U3O8	C	mg/L		1.27605554		0	0	0	0.2908635	0.2908635	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685610	B18020224-004	200.7.8-W-T	MSD3		2/6/2018 9:13:13	1	118186	2/5/2018 8:2	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.4512	4.9024		5	0	4.923	0.093748	0.093748	18	98%	70	130	0%	
Antimony	A	mg/L	0.5144	1.0288		1	0	1.02086	0.0486893	0.0486893	225	103%	70	130	1%	
Arsenic	A	mg/L	0.54952	1.09904		1	0	1.1034	0.0304662	0.0304662	225	110%	70	130	0%	
Barium	A	mg/L	0.49045	0.9809		1	0	0.98762	0.0241141	0.05	18	98%	70	130	1%	
Beryllium	A	mg/L	0.2484	0.4968		0.5	0	0.49602	0.0064467	0.0064467	22.5	99%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685610	B18020224-004	200.7.8-W-T	MSD3		2/6/2018 9:13:13	1	118186	2/5/2018 8:2	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.50541	1.01082		1	0	1.00884	0.0231889	0.05	450	101%	70	130	0%	
Cadmium	A	mg/L	0.24236	0.48472		0.5	0	0.48664	0.0039465	0.0039465	90	97%	70	130	0%	
Calcium	A	mg/L	49.877	99.754		50	48.372	100.14	0.5146149	1	180	103%	70	130	0%	
Chromium	A	mg/L	0.48931	0.97862		1	0	0.97638	0.0032776	0.005	225	98%	70	130	0%	
Cobalt	A	mg/L	0.47156	0.94312		1	0	0.94308	0.0056113	0.0056113	450	94%	70	130	0%	
Copper	A	mg/L	0.48075	0.9615		1	0	0.97422	0.0123657	0.0123657	225	96%	70	130	1%	
Gold	A	mg/L	0.43931	0.87862		1	0	0.87652	0.0300802	0.0300802	90	88%	70	130	0%	
Iron	A	mg/L	2.5775	5.155		5	0.0091	5.1482	0.007404	0.02	360	103%	70	130	0%	
Lead	A	mg/L	0.47584	0.95168		1	0	0.9695	0.0439342	0.0439342	900	95%	70	130	2%	
Lithium	A	mg/L	0.50288	1.00576		1	0	1.0097	0.0151762	0.1	22.5	101%	70	130	0%	
Magnesium	A	mg/L	33.598	67.196		50	16.4698	67.444	0.0568718	1	4500	101%	70	130	0%	
Manganese	A	mg/L	2.4333	4.8666		5	0	4.8698	0.0015443	0.0015443	45	97%	70	130	0%	
Molybdenum	A	mg/L	0.5006	1.0012		1	0	0.99584	0.0057627	0.0057627	225	100%	70	130	1%	
Nickel	A	mg/L	0.46854	0.93708		1	0	0.937	0.0022456	0.005	225	94%	70	130	0%	
Phosphorus	A	mg/L	5.0516	10.1032		10	0	10.0924	0.0370908	0.1	360	101%	70	130	0%	
Potassium	A	mg/L	25.248	50.496		50	0.4701	50.562	0.1354927	1	900	100%	70	130	0%	
Selenium	A	mg/L	0.46449	0.92898		1	0	0.93288	0.0512943	0.0512943	225	93%	70	130	0%	
Silicon	A	mg/L	6.6345	13.269		10	3.1022	13.2574	0.0549747	0.1	450	102%	70	130	0%	
Silver	A	mg/L	0.03792	0		0.1	0	0	0.2268194	0.2268194	2	0%	70	130		S
Sodium	A	mg/L	26.376	52.752		50	0	52.66	2.6745788	2.6745788	4500	106%	70	130	0%	
Strontium	A	mg/L	0.51568	1.03136		1	0.06398	1.03752	0.0005995	0.01	18	97%	70	130	1%	
Tellurium	A	mg/L	0.50863	1.01726		1	0	1.02758	0.0548726	0.0548726	90	102%	70	130	1%	
Thallium	A	mg/L	0.48055	0.9611		1	0	0.95268	0.0171589	0.0171589	225	96%	70	130	1%	
Tin	A	mg/L	0.4994	0.9988		1	0	0.99174	0.0181797	0.05	225	100%	70	130	1%	
Titanium	A	mg/L	0.50944	1.01888		1	0	1.01452	0.0052014	0.0052014	225	102%	70	130	0%	
Uranium	A	mg/L	0.5674	1.1348		1	0	1.08232	0.2467035	0.2467035	900	113%	70	130	5%	
Vanadium	A	mg/L	0.50759	1.01518		1	0	1.01478	0.0084221	0.01	225	102%	70	130	0%	
Zinc	A	mg/L	0.4934	0.9868		1	0	0.98596	0.0050909	0.01	90	99%	70	130	0%	
Calcium as CaCO3	C	mg/L	2.49385	4.9877		0	2.4186	5.007	0.0257307	0.05	5	0%	0	0	0%	
Calcium, meq	C	meq/L		4.9877		0	2.4186	5.007	0.0257307	0.05	5	0%	0	0	0%	
Magnesium, meq	C	meq/L	2.7651154	5.5302308		0	1.3554645	5.5506412	0.0046805	0.0823	5	0%	0	0	0%	
Molybdenum as MoO3	C	mg/L	0.7509	1.5018		0	0	1.49376	0.008644	0.008644	2	0%	0	0	1%	
Molybdenum as MoO4	C	mg/L		1.666998		0	0	1.6580736	0.0095948	0.0095948	5	0%	0	0	1%	
Phosphorus as PO4	C	mg/L	15.508412	31.016824		0	0	30.983668	0.1138687	0.307	5	0%	0	0	0%	
Potassium, meq	C	meq/L	0.64584384	1.29168768		0	0.0120252	1.293376	0.0034659	0.02558	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685610	B18020224-004	200.7.8-W-T	MSD3		2/6/2018 9:13:13	1	118186	2/5/2018 8:2	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silica	C	mg/L	14.1925224	28.3850448		21.392	6.6362262	28.360230	0.117602	0.21392	1000	102%	70	130	0%	
Silicon as SiO2	C	mg/L	14.1925224	28.3850448		21.392	6.6362262	28.360230	0.117602	0.21392	1000	102%	70	130	0%	
Sodium, meq	C	meq/L	1.147356	2.294712		0	0	2.29071	0.1163442	0.1163442	0	0%	0	0	0%	
Uranium, Activity	C	pCi/L	384.1298	768.2596		0	0	732.73064	167.0183	167.0183	0	0%	0	0	5%	
Uranium, U3O8	C	mg/L		1.33792947		0	0	1.2760555	0.2908635	0.2908635	0	0%	0	0	5%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685611	MB-118187	ICP-6010-W-T	MBLK		2/6/2018 9:16:48	1	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00159	0		0	0	0	0.0073023	0.1	18	0%	0	0	0%	
Antimony	A	mg/L	-0.00322	0		0	0	0	0.0285228	0.0285228	225	0%	0	0	0%	
Arsenic	A	mg/L	0.00431	0		0	0	0	0.0088896	0.1	225	0%	0	0	0%	
Barium	A	mg/L	0.00015	0		0	0	0	0.0083625	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00006	0		0	0	0	0.0004159	0.01	22.5	0%	0	0	0%	
Boron	A	mg/L	0.00784	0		0	0	0	0.0100313	0.1	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00009	0		0	0	0	0.0015467	0.01	90	0%	0	0	0%	
Calcium	A	mg/L	0.02393	0		0	0	0	0.2609207	1	180	0%	0	0	0%	
Chromium	A	mg/L	-0.00005	0		0	0	0	0.0026506	0.05	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00035	0		0	0	0	0.0016885	0.02	450	0%	0	0	0%	
Copper	A	mg/L	-0.00068	0		0	0	0	0.0039458	0.01	225	0%	0	0	0%	
Gold	A	mg/L	0.00056	0		0	0	0	0.0130724	0.0130724	90	0%	0	0	0%	
Iron	A	mg/L	0.00457	0		0	0	0	0.0246348	0.03	360	0%	0	0	0%	
Lead	A	mg/L	-0.0022	0		0	0	0	0.0139575	0.05	900	0%	0	0	0%	
Lithium	A	mg/L	-0.00056	0		0	0	0	0.0019333	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.00089	0		0	0	0	0.0391092	1	180	0%	0	0	0%	
Manganese	A	mg/L	0.00018	0		0	0	0	0.0039233	0.01	45	0%	0	0	0%	
Molybdenum	A	mg/L	-0.0003	0		0	0	0	0.0022870	0.1	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00004	0		0	0	0	0.0016423	0.05	225	0%	0	0	0%	
Phosphorus	A	mg/L	-0.00169	0		0	0	0	0.0299514	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	-0.01068	0		0	0	0	0.0711610	1	900	0%	0	0	0%	
Selenium	A	mg/L	-0.00704	0		0	0	0	0.0272690	0.1	225	0%	0	0	0%	
Silicon	A	mg/L	0.0021	0		0	0	0	0.0316774	0.0316774	450	0%	0	0	0%	
Silver	A	mg/L	0.00173	0		0	0	0	0.0024978	0.01	2	0%	0	0	0%	
Sodium	A	mg/L	0.0763	0		0	0	0	0.5332617	1	450	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685611	MB-118187	ICP-6010-W-T	MBLK		2/6/2018 9:16:48	1	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium	A	mg/L	-0.00002	0		0	0	0	0.001396	0.1	18	0%	0	0	0%	
Tellurium	A	mg/L	0.013	0		0	0	0	0.0281479	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00042	0		0	0	0	0.0880486	0.0880486	225	0%	0	0	0%	
Tin	A	mg/L	0.00122	0		0	0	0	0.0060410	0.0060410	225	0%	0	0	0%	
Titanium	A	mg/L	-0.00013	0		0	0	0	0.0531169	0.0531169	225	0%	0	0	0%	
Uranium	A	mg/L	-0.0044	0		0	0	0	0.1175693	0.1175693	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00067	0		0	0	0	0.0033533	0.1	225	0%	0	0	0%	
Zinc	A	mg/L	0.00091	0		0	0	0	0.0036156	0.01	90	0%	0	0	0%	
Silica	C	mg/L	0.004494	0		0	0	0	0.0677897	0.0677897	0	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.004494	0		0	0	0	0.0677897	0.0677897	100	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685612	LCS-118187	ICP-6010-W-T	LCS		2/6/2018 9:20:42	1	118187	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.4605	2.4605		2.5	0	0	0.0073023	0.1	18	98%	80	120	0%	
Antimony	A	mg/L	0.49235	0.49235		0.5	0	0	0.0285228	0.0285228	225	98%	80	120	0%	
Arsenic	A	mg/L	0.5401	0.5401		0.5	0	0	0.0088896	0.1	225	108%	80	120	0%	
Barium	A	mg/L	0.48629	0.48629		0.5	0	0	0.0083625	0.1	18	97%	80	120	0%	
Beryllium	A	mg/L	0.24509	0.24509		0.25	0	0	0.0004159	0.01	22.5	98%	80	120	0%	
Boron	A	mg/L	0.48677	0.48677		0.5	0	0	0.0100313	0.1	450	97%	80	120	0%	
Cadmium	A	mg/L	0.23593	0.23593		0.25	0	0	0.0015467	0.01	90	94%	80	120	0%	
Calcium	A	mg/L	25.218	25.218		25	0	0	0.2609207	1	180	101%	80	120	0%	
Chromium	A	mg/L	0.49217	0.49217		0.5	0	0	0.0026506	0.05	225	98%	80	120	0%	
Cobalt	A	mg/L	0.47399	0.47399		0.5	0	0	0.0016885	0.02	450	95%	80	120	0%	
Copper	A	mg/L	0.47534	0.47534		0.5	0	0	0.0039458	0.01	225	95%	80	120	0%	
Gold	A	mg/L	0.37311	0.37311		0.5	0	0	0.0130724	0.0130724	90	75%	80	120	0%	S
Iron	A	mg/L	2.5721	2.5721		2.5	0	0	0.0246348	0.03	360	103%	80	120	0%	
Lead	A	mg/L	0.47829	0.47829		0.5	0	0	0.0139575	0.05	900	96%	80	120	0%	
Lithium	A	mg/L	0.50369	0.50369		0.5	0	0	0.0019333	0.1	22.5	101%	80	120	0%	
Magnesium	A	mg/L	24.36	24.36		25	0	0	0.0391092	1	180	97%	80	120	0%	
Manganese	A	mg/L	2.4194	2.4194		2.5	0	0	0.0039233	0.01	45	97%	80	120	0%	
Molybdenum	A	mg/L	0.4971	0.4971		0.5	0	0	0.0022870	0.1	225	99%	80	120	0%	
Nickel	A	mg/L	0.46826	0.46826		0.5	0	0	0.0016423	0.05	225	94%	80	120	0%	
Phosphorus	A	mg/L	4.9469	4.9469		5	0	0	0.0299514	0.1	360	99%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685612	LCS-118187	ICP-6010-W-T	LCS		2/6/2018 9:20:42	1	118187	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium	A	mg/L	24.519	24.519		25	0	0	0.0711610	1	900	98%	80	120	0%	
Selenium	A	mg/L	0.44753	0.44753		0.5	0	0	0.0272690	0.1	225	90%	80	120	0%	
Silicon	A	mg/L	4.7796	4.7796		5	0	0	0.0316774	0.0316774	450	96%	80	120	0%	
Silver	A	mg/L	0.0372	0.0372		0.25	0	0	0.0024978	0.01	2	15%	80	120	0%	S
Sodium	A	mg/L	25.08	25.08		25	0	0	0.5332617	1	450	100%	80	120	0%	
Strontium	A	mg/L	0.48499	0.48499		0.5	0	0	0.001396	0.1	18	97%	80	120	0%	
Tellurium	A	mg/L	0.48175	0.48175		0.5	0	0	0.0281479	0.1	90	96%	80	120	0%	
Thallium	A	mg/L	0.4727	0.4727		0.5	0	0	0.0880486	0.0880486	225	95%	80	120	0%	
Tin	A	mg/L	0.49449	0.49449		0.5	0	0	0.0060410	0.0060410	225	99%	80	120	0%	
Titanium	A	mg/L	0.50296	0.50296		0.5	0	0	0.0531169	0.0531169	225	101%	80	120	0%	
Uranium	A	mg/L	0.54553	0.54553		0.5	0	0	0.1175693	0.1175693	900	109%	80	120	0%	
Vanadium	A	mg/L	0.50674	0.50674		0.5	0	0	0.0033533	0.1	225	101%	80	120	0%	
Zinc	A	mg/L	0.48289	0.48289		0.5	0	0	0.0036156	0.01	90	97%	80	120	0%	
Silica	C	mg/L	10.228344	10.228344		10.7	0	0	0.0677897	0.0677897	0	96%	80	120	0%	
Silicon as SiO2	C	mg/L	10.228344	10.228344		10.7	0	0	0.0677897	0.0677897	100	96%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685613	B18020193-001	6010.20-W-T	SAMP		2/6/2018 9:24:17	1	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.03995	0.03995		0	0	0	0.0083625	0.01	18	0%	0	0	0%	
Boron	A	mg/L	0.16086	0.16086		0	0	0	0.0100313	0.05	450	0%	0	0	0%	
Iron	A	mg/L	2.3235	2.3235		0	0	0	0.0246348	0.03	360	0%	0	0	0%	
Phosphorus	A	mg/L	0.0643	0.0643		0	0	0	0.0299514	0.1	360	0%	0	0	0%	J
Silicon	A	mg/L	23.86	23.86		0	0	0	0.0316774	0.1	450	0%	0	0	0%	
Vanadium	A	mg/L	0.06526	0.06526		0	0	0	0.0033533	0.01	225	0%	0	0	0%	
Aluminum	B	mg/L	3.6314	3.6314		0	0	0	0.0073023	0.03	18	0%	0	0	0%	
Antimony	B	mg/L	0.00264	0		0	0	0	0.0285228	0.0285228	225	0%	0	0	0%	L
Arsenic	B	mg/L	0.04178	0.04178		0	0	0	0.0088896	0.0088896	225	0%	0	0	0%	L
Beryllium	B	mg/L	0.00017	0		0	0	0	0.0004159	0.001	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.00034	0		0	0	0	0.0015467	0.0015467	90	0%	0	0	0%	L
Calcium	B	mg/L	8.205	8.205		0	0	0	0.2609207	1	180	0%	0	0	0%	
Chromium	B	mg/L	0.00883	0.00883		0	0	0	0.0026506	0.0026506	225	0%	0	0	0%	L
Cobalt	B	mg/L	0.001	0		0	0	0	0.0016885	0.0016885	450	0%	0	0	0%	L
Copper	B	mg/L	0.00309	0		0	0	0	0.0039458	0.0039458	225	0%	0	0	0%	L

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685613	B18020193-001	6010.20-W-T	SAMP		2/6/2018 9:24:17	1	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	B	mg/L	0.00157	0		0	0	0	0.0139575	0.0139575	900	0%	0	0	0%	L
Lithium	B	mg/L	0.01829	0.01829		0	0	0	0.0019333	0.1	22.5	0%	0	0	0%	J
Magnesium	B	mg/L	3.5947	3.5947		0	0	0	0.0489894	1	4500	0%	0	0	0%	
Manganese	B	mg/L	0.05948	0.05948		0	0	0	0.0039233	0.01	45	0%	0	0	0%	
Molybdenum	B	mg/L	0.00865	0.00865		0	0	0	0.0022870	0.0022870	225	0%	0	0	0%	L
Nickel	B	mg/L	0.00755	0.00755		0	0	0	0.0016423	0.0016423	225	0%	0	0	0%	L
Potassium	B	mg/L	6.4218	6.4218		0	0	0	0.0711610	1	900	0%	0	0	0%	
Selenium	B	mg/L	0.01183	0		0	0	0	0.0272690	0.0272690	225	0%	0	0	0%	L
Sodium	B	mg/L	173.21	173.21		0	0	0	0.4268827	1	4500	0%	0	0	0%	
Strontium	B	mg/L	0.12306	0.12306		0	0	0	0.001396	0.01	18	0%	0	0	0%	
Tellurium	B	mg/L	0.01567	0		0	0	0	0.0281479	0.0281479	90	0%	0	0	0%	L
Thallium	B	mg/L	-0.00163	0		0	0	0	0.0880486	0.0880486	225	0%	0	0	0%	L
Tin	B	mg/L	-0.00142	0		0	0	0	0.0060410	0.05	225	0%	0	0	0%	
Titanium	B	mg/L	0.11076	0.11076		0	0	0	0.0531169	0.0531169	225	0%	0	0	0%	L
Uranium	B	mg/L	0.05722	0		0	0	0	0.1175693	0.1175693	900	0%	0	0	0%	L
Zinc	B	mg/L	0.00803	0.00803		0	0	0	0.0036156	0.01	90	0%	0	0	0%	J
Silica	C	mg/L	51.0604	51.0604		0	0	0	0.0677897	0.214	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	51.0604	51.0604		0	0	0	0.0677897	0.214	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685614	B18020193-001	6010.20-W-T	SD		2/6/2018 9:28:13	5	118187	2/7/2018 8:3	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.75674	3.7837		0	0	3.6314	0.0365114	0.0365114	18	0%			4%	
Antimony	A	mg/L	0.004032	0		0	0	0	0.1426142	0.1426142	225	0%				
Arsenic	A	mg/L	0.008844	0		0	0	0.04178	0.0444478	0.0444478	225	0%				
Barium	A	mg/L	0.007998	0		0	0	0.03995	0.0418126	0.05	18	0%				
Beryllium	A	mg/L	-0.000002	0		0	0	0	0.0020796	0.0020796	22.5	0%				
Boron	A	mg/L	0.03271	0.16355		0	0	0.16086	0.0501565	0.0501565	450	0%				N
Cadmium	A	mg/L	0.000338	0		0	0	0	0.0077334	0.0077334	90	0%				
Calcium	A	mg/L	1.70406	8.5203		0	0	8.205	1.3046033	1.3046033	180	0%				N
Chromium	A	mg/L	0.009874	0.04937		0	0	0.00883	0.0132528	0.0132528	225	0%				N
Cobalt	A	mg/L	0.001276	0		0	0	0	0.0084425	0.0084425	450	0%				
Copper	A	mg/L	-0.000306	0		0	0	0	0.0197291	0.0197291	225	0%				
Gold	A	mg/L	-0.002388	0		0	0	0	0.0653618	0.0653618	90	0%				

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685614	B18020193-001	6010.20-W-T	SD		2/6/2018 9:28:13	5	118187	2/7/2018 8:3	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	mg/L	0.47892	2.3946		0	0	2.3235	0.1231738	0.1231738	360	0%			3%	
Lead	A	mg/L	-0.003226	0		0	0	0	0.0697876	0.0697876	900	0%				
Lithium	A	mg/L	0.004154	0.02077		0	0	0.01829	0.0096666	0.1	22.5	0%				N
Magnesium	A	mg/L	0.75566	3.7783		0	0	3.5947	0.2449470	1	4500	0%			5%	
Manganese	A	mg/L	0.012446	0.06223		0	0	0.05948	0.0196164	0.0196164	45	0%				N
Molybdenum	A	mg/L	0.001674	0		0	0	0.00865	0.0114350	0.0114350	225	0%				
Nickel	A	mg/L	0.00107	0		0	0	0.00755	0.0082115	0.0082115	225	0%				
Phosphorus	A	mg/L	0.013596	0		0	0	0.0643	0.1497571	0.1497571	360	0%				
Potassium	A	mg/L	1.3327	6.6635		0	0	6.4218	0.3558050	1	900	0%			4%	
Selenium	A	mg/L	-0.00678	0		0	0	0	0.1363452	0.1363452	225	0%				
Silicon	A	mg/L	5.4386	27.193		0	0	23.86	0.1583871	0.1583871	450	0%			13%	R
Silver	A	mg/L	-0.000172	0		0	0	0	0.0124888	0.0124888	2	0%				
Sodium	A	mg/L	36.062	180.31		0	0	173.21	2.1344133	2.1344133	4500	0%			4%	
Strontium	A	mg/L	0.025282	0.12641		0	0	0.12306	0.0069798	0.01	18	0%			3%	
Tellurium	A	mg/L	0.011632	0		0	0	0	0.1407395	0.1407395	90	0%				
Thallium	A	mg/L	-0.001852	0		0	0	0	0.4402429	0.4402429	225	0%				
Tin	A	mg/L	-0.000066	0		0	0	0	0.0302052	0.05	225	0%				
Titanium	A	mg/L	0.0219	0		0	0	0.11076	0.2655845	0.2655845	225	0%				
Uranium	A	mg/L	0.05539	0		0	0	0	0.5878465	0.5878465	900	0%				
Vanadium	A	mg/L	0.01228	0.0614		0	0	0.06526	0.0167666	0.0167666	225	0%				N
Zinc	A	mg/L	0.002152	0		0	0	0.00803	0.0180778	0.0180778	90	0%				
Silica	C	mg/L	11.638604	58.19302		0	0	51.0604	0.3389483	0.3389483	1000	0%			13%	R
Silicon as SiO2	C	mg/L	11.638604	58.19302		0	0	51.0604	0.3389483	0.3389483	1000	0%			13%	R

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685615	B18020193-001	6010.20-W-T	PDS		2/6/2018 9:32:03	1.03	118187	2/7/2018 8:3	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	7.83213592	8.0671		5.15	3.6314	0	0.0075213	0.03	18	86%	75	125	0%	
Antimony	A	mg/L	0.93237864	0.96035		1.03	0	0	0.0293785	0.0293785	225	93%	75	125	0%	
Arsenic	A	mg/L	0.97611650	1.0054		1.03	0.04178	0	0.0091562	0.0091562	225	94%	75	125	0%	
Barium	A	mg/L	0.93090291	0.95883		1.03	0.03995	0	0.0086134	0.05	18	89%	75	125	0%	
Beryllium	A	mg/L	0.46125243	0.47509		0.515	0	0	0.0004284	0.001	22.5	92%	75	125	0%	
Boron	A	mg/L	1.07271845	1.1049		1.03	0.16086	0	0.0103322	0.05	450	92%	75	125	0%	
Cadmium	A	mg/L	0.44586408	0.45924		0.515	0	0	0.0015931	0.0015931	90	89%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685615	B18020193-001	6010.20-W-T	PDS		2/6/2018 9:32:03	1.03	118187	2/7/2018 8:3	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	mg/L	54.5300971	56.166		51.5	8.205	0	0.2687483	1	180	93%	75	125	0%	
Chromium	A	mg/L	0.92482524	0.95257		1.03	0.00883	0	0.0027301	0.005	225	92%	75	125	0%	
Cobalt	A	mg/L	0.88367961	0.91019		1.03	0	0	0.0017392	0.005	450	88%	75	125	0%	
Copper	A	mg/L	0.88173786	0.90819		1.03	0	0	0.0040642	0.005	225	88%	75	125	0%	
Gold	A	mg/L	0.85282524	0.87841		1.03	0	0	0.0134645	0.0134645	90	85%	75	125	0%	
Iron	A	mg/L	6.89339806	7.1002		5.15	2.3235	0	0.0253738	0.03	360	93%	75	125	0%	
Lead	A	mg/L	0.91466990	0.94211		1.03	0	0	0.0143762	0.0143762	900	91%	75	125	0%	
Lithium	A	mg/L	0.92635922	0.95415		1.03	0.01829	0	0.0019913	0.1	22.5	91%	75	125	0%	
Magnesium	A	mg/L	49.2475728	50.725		51.5	3.5947	0	0.0504591	1	4500	92%	75	125	0%	
Manganese	A	mg/L	4.55718447	4.6939		5.15	0.05948	0	0.004041	0.004041	45	90%	75	125	0%	
Molybdenum	A	mg/L	0.93902913	0.9672		1.03	0.00865	0	0.0023556	0.0023556	225	93%	75	125	0%	
Nickel	A	mg/L	0.88132039	0.90776		1.03	0.00755	0	0.0016916	0.005	225	87%	75	125	0%	
Phosphorus	A	mg/L	9.4831068	9.7676		10.3	0.0643	0	0.03085	0.1	360	94%	75	125	0%	
Potassium	A	mg/L	51.2572816	52.795		51.5	6.4218	0	0.0732958	1	900	90%	75	125	0%	
Selenium	A	mg/L	0.89836893	0.92532		1.03	0	0	0.0280871	0.0280871	225	90%	75	125	0%	
Silicon	A	mg/L	38.2281553	39.375		10.3	23.86	0	0.0326277	0.1	450	151%	75	125	0%	S
Silver	A	mg/L	0.40211650	0.41418		0.515	0	0	0.0025727	0.0025727	2	80%	75	125	0%	
Sodium	A	mg/L	210.31068	216.62		51.5	173.21	0	0.4396891	1	4500	84%	75	125	0%	
Strontium	A	mg/L	1.00864078	1.0389		1.03	0.12306	0	0.0014378	0.01	18	89%	75	125	0%	
Tellurium	A	mg/L	0.913	0.94039		1.03	0	0	0.0289923	0.0289923	90	91%	75	125	0%	
Thallium	A	mg/L	0.88178641	0.90824		1.03	0	0	0.0906900	0.0906900	225	88%	75	125	0%	
Tin	A	mg/L	0.92281553	0.9505		1.03	0	0	0.0062223	0.05	225	92%	75	125	0%	
Titanium	A	mg/L	1.04446602	1.0758		1.03	0.11076	0	0.0547104	0.0547104	225	94%	75	125	0%	
Uranium	A	mg/L	0.89448544	0.92132		0	0	0	0.1210964	0.1210964	900	0%	75	125	0%	
Vanadium	A	mg/L	1.00514563	1.0353		1.03	0.06526	0	0.0034539	0.01	225	94%	75	125	0%	
Zinc	A	mg/L	0.91527184	0.94273		1.03	0.00803	0	0.0037240	0.01	90	91%	75	125	0%	
Silica	C	mg/L	81.8082524	84.2625		22.042	51.0604	0	0.0698234	0.214	1000	151%	75	125	0%	S
Silicon as SiO2	C	mg/L	81.8082524	84.2625		22.042	51.0604	0	0.0698234	0.214	1000	151%	75	125	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685616	CCV	ICP-200.7-W-D	CCV		2/6/2018 9:35:38	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685616	CCV	ICP-200.7-W-D	CCV		2/6/2018 9:35:38	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5285	2.5285		2.5	0	0	0.0066084	0.1	18	101%	90	110	0%	
Antimony	A	mg/L	2.5173	2.5173		2.5	0	0	0.0356182	0.05	225	101%	90	110	0%	
Arsenic	A	mg/L	2.5398	2.5398		2.5	0	0	0.0231651	0.1	225	102%	90	110	0%	
Barium	A	mg/L	2.3975	2.3975		2.5	0	0	0.0003929	0.1	18	96%	90	110	0%	
Beryllium	A	mg/L	1.2692	1.2692		1.25	0	0	0.0002318	0.01	22.5	102%	90	110	0%	
Boron	A	mg/L	2.4927	2.4927		2.5	0	0	0.0080048	0.1	450	100%	90	110	0%	
Cadmium	A	mg/L	2.4199	2.4199		2.5	0	0	0.0010328	0.01	90	97%	90	110	0%	
Calcium	A	mg/L	25.82	25.82		25	0	0	0.1071422	1	180	103%	90	110	0%	
Chromium	A	mg/L	2.4873	2.4873		2.5	0	0	0.0010626	0.05	225	99%	90	110	0%	
Cobalt	A	mg/L	2.4017	2.4017		2.5	0	0	0.0033639	0.02	450	96%	90	110	0%	
Copper	A	mg/L	2.4182	2.4182		2.5	0	0	0.0048764	0.01	225	97%	90	110	0%	
Gold	A	mg/L	2.4076	2.4076		2.5	0	0	0.0189485	0.1	90	96%	90	110	0%	
Iron	A	mg/L	2.6192	2.6192		2.5	0	0	0.0250321	0.0250321	360	105%	90	110	0%	
Lead	A	mg/L	2.4945	2.4945		2.5	0	0	0.0187623	0.05	900	100%	90	110	0%	
Lithium	A	mg/L	1.2214	1.2214		1.25	0	0	0.0059040	0.1	22.5	98%	90	110	0%	
Magnesium	A	mg/L	24.849	24.849		25	0	0	0.0116555	1	180	99%	90	110	0%	
Manganese	A	mg/L	2.4482	2.4482		2.5	0	0	0.0010649	0.01	45	98%	90	110	0%	
Mercury	A	mg/L	1.0077	1.0077		1	0	0	0.0100947	0.02	45	101%	90	110	0%	
Molybdenum	A	mg/L	2.5243	2.5243		2.5	0	0	0.0031266	0.1	225	101%	90	110	0%	
Nickel	A	mg/L	2.3999	2.3999		2.5	0	0	0.0012530	0.05	225	96%	90	110	0%	
Phosphorus	A	mg/L	2.559	2.559		2.5	0	0	0.0425464	0.1	360	102%	90	110	0%	
Potassium	A	mg/L	24.592	24.592		25	0	0	0.0854754	1	900	98%	90	110	0%	
Selenium	A	mg/L	2.4027	2.4027		2.5	0	0	0.0234201	0.1	225	96%	90	110	0%	
Silicon	A	mg/L	5.1838	5.1838		5	0	0	0.0487685	0.1	450	104%	90	110	0%	
Silver	A	mg/L	0.96864	0.96864		1	0	0	0.0055813	0.01	2	97%	90	110	0%	
Sodium	A	mg/L	24.86	24.86		25	0	0	0.1131395	1	450	99%	90	110	0%	
Strontium	A	mg/L	2.3793	2.3793		2.5	0	0	0.0002417	0.1	18	95%	90	110	0%	
Tellurium	A	mg/L	2.4555	2.4555		2.5	0	0	0.0301968	0.1	90	98%	90	110	0%	
Thallium	A	mg/L	2.4331	2.4331		2.5	0	0	0.0116401	0.5	225	97%	90	110	0%	
Tin	A	mg/L	2.5272	2.5272		2.5	0	0	0.0081865	0.1	225	101%	90	110	0%	
Titanium	A	mg/L	2.5048	2.5048		2.5	0	0	0.002716	0.01	225	100%	90	110	0%	
Uranium	A	mg/L	2.3496	2.3496		2.5	0	0	0.1154022	0.1154022	900	94%	90	110	0%	
Vanadium	A	mg/L	2.5395	2.5395		2.5	0	0	0.0036660	0.1	225	102%	90	110	0%	
Zinc	A	mg/L	2.4651	2.4651		2.5	0	0	0.0023364	0.01	90	99%	90	110	0%	
Silica	C	mg/L	11.089185	11.089185		10.7	0	0	0.1043257	0.21392	100	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685616	CCV	ICP-200.7-W-D	CCV		2/6/2018 9:35:38	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	11.089185	11.089185		10.7	0	0	0.1043257	0.21392	0	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685617	CCB	ICP-200.7-W-D	CCB		2/6/2018 9:39:19	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00131	0.00131		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.0039	-0.0039		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00124	0.00124		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.0006	0.0006		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00031	0.00031		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00087	0.00087		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00084	0.00084		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00709	0.00709		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00071	0.00071		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00071	0.00071		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00105	0.00105		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00669	0.00669		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.00208	0.00208		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00236	-0.00236		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00057	0.00057		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00651	0.00651		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00043	0.00043		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00033	0.00033		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00123	0.00123		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0.00043	0.00043		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.00145	0.00145		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.02897	0.02897		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	-0.01075	-0.01075		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.05717	0.05717		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00136	-0.00136		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.0972	0.0972		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00053	0.00053		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.00965	0.00965		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.0012	-0.0012		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685617	CCB	ICP-200.7-W-D	CCB		2/6/2018 9:39:19	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00146	0.00146		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00017	0.00017		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	0.03948	0.03948		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.00016	0.00016		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00051	0.00051		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.12229806	0.12229806		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.12229806	0.12229806		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685618	B18020193-001	6010.20-W-T	MS3		2/6/2018 9:43:14	1	118187	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	6.4615	6.4615		2.5	3.6314	0	0.0073023	0.03	18	113%	75	125	0%	
Antimony	A	mg/L	0.47835	0.47835		0.5	0	0	0.0285228	0.0285228	225	96%	75	125	0%	
Arsenic	A	mg/L	0.56462	0.56462		0.5	0.04178	0	0.0088896	0.0088896	225	105%	75	125	0%	
Barium	A	mg/L	0.49798	0.49798		0.5	0.03995	0	0.0083625	0.05	18	92%	75	125	0%	
Beryllium	A	mg/L	0.23782	0.23782		0.25	0	0	0.0004159	0.001	22.5	95%	75	125	0%	
Boron	A	mg/L	0.61935	0.61935		0.5	0.16086	0	0.0100313	0.05	450	92%	75	125	0%	
Cadmium	A	mg/L	0.22814	0.22814		0.25	0	0	0.0015467	0.0015467	90	91%	75	125	0%	
Calcium	A	mg/L	32.274	32.274		25	8.205	0	0.2609207	1	180	96%	75	125	0%	
Chromium	A	mg/L	0.48269	0.48269		0.5	0.00883	0	0.0026506	0.005	225	95%	75	125	0%	
Cobalt	A	mg/L	0.45977	0.45977		0.5	0	0	0.0016885	0.005	450	92%	75	125	0%	
Copper	A	mg/L	0.46023	0.46023		0.5	0	0	0.0039458	0.005	225	92%	75	125	0%	
Gold	A	mg/L	0.32657	0.32657		0.5	0	0	0.0130724	0.0130724	90	65%	75	125	0%	S
Iron	A	mg/L	4.8192	4.8192		2.5	2.3235	0	0.0246348	0.03	360	100%	75	125	0%	
Lead	A	mg/L	0.47706	0.47706		0.5	0	0	0.0139575	0.0139575	900	95%	75	125	0%	
Lithium	A	mg/L	0.48734	0.48734		0.5	0.01829	0	0.0019333	0.1	22.5	94%	75	125	0%	
Magnesium	A	mg/L	27.178	27.178		25	3.5947	0	0.0489894	1	4500	94%	75	125	0%	
Manganese	A	mg/L	2.3789	2.3789		2.5	0.05948	0	0.0039233	0.0039233	45	93%	75	125	0%	
Molybdenum	A	mg/L	0.49584	0.49584		0.5	0.00865	0	0.0022870	0.0022870	225	97%	75	125	0%	
Nickel	A	mg/L	0.45877	0.45877		0.5	0.00755	0	0.0016423	0.005	225	90%	75	125	0%	
Phosphorus	A	mg/L	4.9018	4.9018		5	0.0643	0	0.0299514	0.1	360	97%	75	125	0%	
Potassium	A	mg/L	29.579	29.579		25	6.4218	0	0.0711610	1	900	93%	75	125	0%	
Selenium	A	mg/L	0.47018	0.47018		0.5	0	0	0.0272690	0.0272690	225	94%	75	125	0%	
Silicon	A	mg/L	32.61	32.61		5	23.86	0	0.0316774	0.1	450		75	125	0%	A

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685618	B18020193-001	6010.20-W-T	MS3		2/6/2018 9:43:14	1	118187	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	0.03551	0.03551		0.25	0	0	0.0024978	0.0024978	2	14%	75	125	0%	S
Sodium	A	mg/L	192.46	192.46		25	173.21	0	0.4268827	1	4500		75	125	0%	A
Strontium	A	mg/L	0.58024	0.58024		0.5	0.12306	0	0.001396	0.01	18	91%	75	125	0%	
Tellurium	A	mg/L	0.47517	0.47517		0.5	0	0	0.0281479	0.0281479	90	95%	75	125	0%	
Thallium	A	mg/L	0.4544	0.4544		0.5	0	0	0.0880486	0.0880486	225	91%	75	125	0%	
Tin	A	mg/L	0.4872	0.4872		0.5	0	0	0.0060410	0.05	225	97%	75	125	0%	
Titanium	A	mg/L	0.60621	0.60621		0.5	0.11076	0	0.0531169	0.0531169	225	99%	75	125	0%	
Uranium	A	mg/L	0.56399	0.56399		0.5	0	0	0.1175693	0.1175693	900	113%	75	125	0%	
Vanadium	A	mg/L	0.55443	0.55443		0.5	0.06526	0	0.0033533	0.01	225	98%	75	125	0%	
Zinc	A	mg/L	0.47474	0.47474		0.5	0.00803	0	0.0036156	0.01	90	93%	75	125	0%	
Silica	C	mg/L	69.7854	69.7854		10.7	51.0604	0	0.0677897	0.214	1000		75	125	0%	A
Silicon as SiO2	C	mg/L	69.7854	69.7854		10.7	51.0604	0	0.0677897	0.214	1000		75	125	0%	A

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685619	B18020193-001	6010.20-W-T	MSD3		2/6/2018 9:46:58	1	118187	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	6.3776	6.3776		2.5	3.6314	6.4615	0.0073023	0.03	18	110%	75	125	1%	
Antimony	A	mg/L	0.47436	0.47436		0.5	0	0.47835	0.0285228	0.0285228	225	95%	75	125	1%	
Arsenic	A	mg/L	0.55519	0.55519		0.5	0.04178	0.56462	0.0088896	0.0088896	225	103%	75	125	2%	
Barium	A	mg/L	0.48848	0.48848		0.5	0.03995	0.49798	0.0083625	0.05	18	90%	75	125	2%	
Beryllium	A	mg/L	0.23117	0.23117		0.25	0	0.23782	0.0004159	0.001	22.5	92%	75	125	3%	
Boron	A	mg/L	0.60509	0.60509		0.5	0.16086	0.61935	0.0100313	0.05	450	89%	75	125	2%	
Cadmium	A	mg/L	0.22315	0.22315		0.25	0	0.22814	0.0015467	0.0015467	90	89%	75	125	2%	
Calcium	A	mg/L	31.613	31.613		25	8.205	32.274	0.2609207	1	180	94%	75	125	2%	
Chromium	A	mg/L	0.47422	0.47422		0.5	0.00883	0.48269	0.0026506	0.005	225	93%	75	125	2%	
Cobalt	A	mg/L	0.45007	0.45007		0.5	0	0.45977	0.0016885	0.005	450	90%	75	125	2%	
Copper	A	mg/L	0.44483	0.44483		0.5	0	0.46023	0.0039458	0.005	225	89%	75	125	3%	
Gold	A	mg/L	0.35996	0.35996		0	0	0.32657	0.0130724	0.0130724	90	0%	75	125	10%	
Iron	A	mg/L	4.7109	4.7109		2.5	2.3235	4.8192	0.0246348	0.03	360	95%	75	125	2%	
Lead	A	mg/L	0.46191	0.46191		0.5	0	0.47706	0.0139575	0.0139575	900	92%	75	125	3%	
Lithium	A	mg/L	0.47227	0.47227		0.5	0.01829	0.48734	0.0019333	0.1	22.5	91%	75	125	3%	
Magnesium	A	mg/L	26.492	26.492		25	3.5947	27.178	0.0489894	1	4500	92%	75	125	3%	
Manganese	A	mg/L	2.3196	2.3196		2.5	0.05948	2.3789	0.0039233	0.0039233	45	90%	75	125	3%	
Molybdenum	A	mg/L	0.499	0.499		0.5	0.00865	0.49584	0.0022870	0.0022870	225	98%	75	125	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685619	B18020193-001	6010.20-W-T	MSD3		2/6/2018 9:46:58	1	118187	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/L	0.44947	0.44947		0.5	0.00755	0.45877	0.0016423	0.005	225	88%	75	125	2%	
Phosphorus	A	mg/L	4.7626	4.7626		5	0.0643	4.9018	0.0299514	0.1	360	94%	75	125	3%	
Potassium	A	mg/L	28.738	28.738		25	6.4218	29.579	0.0711610	1	900	89%	75	125	3%	
Selenium	A	mg/L	0.46234	0.46234		0.5	0	0.47018	0.0272690	0.0272690	225	92%	75	125	2%	
Silicon	A	mg/L	30.454	30.454		5	23.86	32.61	0.0316774	0.1	450		75	125	7%	A
Silver	A	mg/L	0.03317	0.03317		0.25	0	0.03551	0.0024978	0.0024978	2	13%	75	125	7%	S
Sodium	A	mg/L	190.16	190.16		25	173.21	192.46	0.4268827	1	4500		75	125	1%	A
Strontium	A	mg/L	0.57005	0.57005		0.5	0.12306	0.58024	0.001396	0.01	18	89%	75	125	2%	
Tellurium	A	mg/L	0.47769	0.47769		0	0	0.47517	0.0281479	0.0281479	90	0%	0	0	1%	
Thallium	A	mg/L	0.44476	0.44476		0.5	0	0.4544	0.0880486	0.0880486	225	89%	75	125	2%	
Tin	A	mg/L	0.48555	0.48555		0.5	0	0.4872	0.0060410	0.05	225	97%	75	125	0%	
Titanium	A	mg/L	0.60271	0.60271		0.5	0.11076	0.60621	0.0531169	0.0531169	225	98%	75	125	1%	
Uranium	A	mg/L	0.6073	0.6073		0.5	0	0.56399	0.1175693	0.1175693	900	121%	75	125	7%	
Vanadium	A	mg/L	0.54303	0.54303		0.5	0.06526	0.55443	0.0033533	0.01	225	96%	75	125	2%	
Zinc	A	mg/L	0.46321	0.46321		0.5	0.00803	0.47474	0.0036156	0.01	90	91%	75	125	2%	
Silica	C	mg/L	65.17156	65.17156		21.4	51.0604	69.7854	0.0677897	0.214	1000	66%	75	125	7%	S
Silicon as SiO2	C	mg/L	65.17156	65.17156		21.4	51.0604	69.7854	0.0677897	0.214	1000	66%	75	125	7%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685620	B18020193-002	6010.20-W-T	SAMP		2/6/2018 9:50:41	2	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	1.1223	2.2446		0	0	0	0.0146046	0.03	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00006	0		0	0	0	0.0008318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.085385	0.17077		0	0	0	0.0200626	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	6.8605	13.721		0	0	0	0.5218413	1	180	0%	0	0	0%	
Iron	A	mg/L	0.73695	1.4739		0	0	0	0.0492695	0.0492695	360	0%	0	0	0%	D
Lithium	A	mg/L	0.014925	0.02985		0	0	0	0.0038666	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	2.9327	5.8654		0	0	0	0.0979788	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.01516	0.03032		0	0	0	0.0078465	0.01	45	0%	0	0	0%	
Phosphorus	A	mg/L	0.023735	0		0	0	0	0.0599028	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	5.2135	10.427		0	0	0	0.1423220	1	900	0%	0	0	0%	
Silicon	A	mg/L	15.9725	31.945		0	0	0	0.0633548	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	145.625	291.25		0	0	0	0.8537653	1	4500	0%	0	0	0%	
Strontium	A	mg/L	0.14746	0.29492		0	0	0	0.0027919	0.01	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685620	B18020193-002	6010.20-W-T	SAMP		2/6/2018 9:50:41	2	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.001445	0		0	0	0	0.0120821	0.05	225	0%	0	0	0%	
Vanadium	A	mg/L	0.01627	0.03254		0	0	0	0.0067066	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00272	0		0	0	0	0.0072311	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	-0.001705	0		0	0	0	0.0570457	0.0570457	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.019205	0.03841		0	0	0	0.0177791	0.0177791	225	0%	0	0	0%	D
Barium	B	mg/L	0.052045	0.10409		0	0	0	0.0167251	0.0167251	18	0%	0	0	0%	D
Cadmium	B	mg/L	0.00023	0		0	0	0	0.0030934	0.0030934	90	0%	0	0	0%	D
Chromium	B	mg/L	0.008305	0.01661		0	0	0	0.0053011	0.0053011	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.000585	0		0	0	0	0.003377	0.003377	450	0%	0	0	0%	D
Copper	B	mg/L	0.001075	0		0	0	0	0.0078916	0.0078916	225	0%	0	0	0%	D
Lead	B	mg/L	-0.00235	0		0	0	0	0.0279150	0.0279150	900	0%	0	0	0%	D
Molybdenum	B	mg/L	0.013175	0.02635		0	0	0	0.0045740	0.0045740	225	0%	0	0	0%	D
Nickel	B	mg/L	0.004235	0.00847		0	0	0	0.0032846	0.0032846	225	0%	0	0	0%	D
Selenium	B	mg/L	0.05364	0.10728		0	0	0	0.0545381	0.0545381	225	0%	0	0	0%	D
Tellurium	B	mg/L	0.01596	0		0	0	0	0.0562958	0.0562958	90	0%	0	0	0%	D
Thallium	B	mg/L	0.00075	0		0	0	0	0.1760972	0.1760972	225	0%	0	0	0%	D
Titanium	B	mg/L	0.03877	0		0	0	0	0.1062338	0.1062338	225	0%	0	0	0%	D
Uranium	B	mg/L	0.0548	0		0	0	0	0.2351386	0.2351386	900	0%	0	0	0%	D
Silica	C	mg/L	34.18115	68.3623		0	0	0	0.1355793	0.214	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	34.18115	68.3623		0	0	0	0.1355793	0.214	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685621	B18020193-003	6010.20-W-T	SAMP		2/6/2018 9:54:38	1	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.17907	0.17907		0	0	0	0.0073023	0.03	18	0%	0	0	0%	
Barium	A	mg/L	0.02798	0.02798		0	0	0	0.0083625	0.01	18	0%	0	0	0%	
Beryllium	A	mg/L	0	0		0	0	0	0.0004159	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.10392	0.10392		0	0	0	0.0100313	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	9.3922	9.3922		0	0	0	0.2609207	1	180	0%	0	0	0%	
Iron	A	mg/L	0.12186	0.12186		0	0	0	0.0246348	0.03	360	0%	0	0	0%	
Lithium	A	mg/L	0.02185	0.02185		0	0	0	0.0019333	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	4.1842	4.1842		0	0	0	0.0489894	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.00554	0.00554		0	0	0	0.0039233	0.01	45	0%	0	0	0%	J
Phosphorus	A	mg/L	0.03362	0.03362		0	0	0	0.0299514	0.1	360	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685621	B18020193-003	6010.20-W-T	SAMP		2/6/2018 9:54:38	1	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium	A	mg/L	6.3704	6.3704		0	0	0	0.0711610	1	900	0%	0	0	0%	
Silicon	A	mg/L	30.628	30.628		0	0	0	0.0316774	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	146.13	146.13		0	0	0	0.4268827	1	4500	0%	0	0	0%	
Strontium	A	mg/L	0.21488	0.21488		0	0	0	0.001396	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00226	0		0	0	0	0.0060410	0.05	225	0%	0	0	0%	
Vanadium	A	mg/L	0.06523	0.06523		0	0	0	0.0033533	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00231	0		0	0	0	0.0036156	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	-0.0056	0		0	0	0	0.0285228	0.0285228	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.02726	0.02726		0	0	0	0.0088896	0.0088896	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00062	0		0	0	0	0.0015467	0.0015467	90	0%	0	0	0%	DL
Chromium	B	mg/L	0.00083	0		0	0	0	0.0026506	0.0026506	225	0%	0	0	0%	DL
Cobalt	B	mg/L	0.00002	0		0	0	0	0.0016885	0.0016885	450	0%	0	0	0%	DL
Copper	B	mg/L	0.00168	0		0	0	0	0.0039458	0.0039458	225	0%	0	0	0%	DL
Lead	B	mg/L	0.00376	0		0	0	0	0.0139575	0.0139575	900	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.01306	0.01306		0	0	0	0.0022870	0.0022870	225	0%	0	0	0%	DL
Nickel	B	mg/L	-0.00075	0		0	0	0	0.0016423	0.0016423	225	0%	0	0	0%	DL
Selenium	B	mg/L	-0.00035	0		0	0	0	0.0272690	0.0272690	225	0%	0	0	0%	DL
Tellurium	B	mg/L	0.00813	0		0	0	0	0.0281479	0.0281479	90	0%	0	0	0%	DL
Thallium	B	mg/L	0.00133	0		0	0	0	0.0880486	0.0880486	225	0%	0	0	0%	DL
Titanium	B	mg/L	0.0057	0		0	0	0	0.0531169	0.0531169	225	0%	0	0	0%	DL
Uranium	B	mg/L	0.07113	0		0	0	0	0.1175693	0.1175693	900	0%	0	0	0%	DL
Silica	C	mg/L	65.54392	65.54392		0	0	0	0.0677897	0.214	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	65.54392	65.54392		0	0	0	0.0677897	0.214	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685622	B18020193-004	6010.20-W-T	SAMP		2/6/2018 9:58:36	1	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.6315	0.6315		0	0	0	0.0073023	0.03	18	0%	0	0	0%	
Barium	A	mg/L	0.02519	0.02519		0	0	0	0.0083625	0.01	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00003	0		0	0	0	0.0004159	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.15443	0.15443		0	0	0	0.0100313	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	9.0503	9.0503		0	0	0	0.2609207	1	180	0%	0	0	0%	
Iron	A	mg/L	0.38893	0.38893		0	0	0	0.0246348	0.03	360	0%	0	0	0%	
Lithium	A	mg/L	0.02529	0.02529		0	0	0	0.0019333	0.1	22.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685622	B18020193-004	6010.20-W-T	SAMP		2/6/2018 9:58:36	1	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Magnesium	A	mg/L	4.5499	4.5499		0	0	0	0.0489894	1	4500	0%	0	0	0%	
Manganese	A	mg/L	0.00868	0.00868		0	0	0	0.0039233	0.01	45	0%	0	0	0%	J
Phosphorus	A	mg/L	0.01325	0		0	0	0	0.0299514	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	7.2602	7.2602		0	0	0	0.0711610	1	900	0%	0	0	0%	
Silicon	A	mg/L	33.25	33.25		0	0	0	0.0316774	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	160.6	160.6		0	0	0	0.4268827	1	4500	0%	0	0	0%	
Strontium	A	mg/L	0.21776	0.21776		0	0	0	0.001396	0.01	18	0%	0	0	0%	
Tin	A	mg/L	-0.00086	0		0	0	0	0.0060410	0.05	225	0%	0	0	0%	
Vanadium	A	mg/L	0.04043	0.04043		0	0	0	0.0033533	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00319	0		0	0	0	0.0036156	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	0.00348	0		0	0	0	0.0285228	0.0285228	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.02006	0.02006		0	0	0	0.0088896	0.0088896	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00062	0		0	0	0	0.0015467	0.0015467	90	0%	0	0	0%	DL
Chromium	B	mg/L	0.00074	0		0	0	0	0.0026506	0.0026506	225	0%	0	0	0%	DL
Cobalt	B	mg/L	-0.00004	0		0	0	0	0.0016885	0.0016885	450	0%	0	0	0%	DL
Copper	B	mg/L	0.00011	0		0	0	0	0.0039458	0.0039458	225	0%	0	0	0%	DL
Lead	B	mg/L	-0.00673	0		0	0	0	0.0139575	0.0139575	900	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.0075	0.0075		0	0	0	0.0022870	0.0022870	225	0%	0	0	0%	DL
Nickel	B	mg/L	-0.00052	0		0	0	0	0.0016423	0.0016423	225	0%	0	0	0%	DL
Selenium	B	mg/L	-0.00689	0		0	0	0	0.0272690	0.0272690	225	0%	0	0	0%	DL
Tellurium	B	mg/L	0.00948	0		0	0	0	0.0281479	0.0281479	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00346	0		0	0	0	0.0880486	0.0880486	225	0%	0	0	0%	DL
Titanium	B	mg/L	0.0199	0		0	0	0	0.0531169	0.0531169	225	0%	0	0	0%	DL
Uranium	B	mg/L	0.02813	0		0	0	0	0.1175693	0.1175693	900	0%	0	0	0%	DL
Silica	C	mg/L	71.155	71.155		0	0	0	0.0677897	0.214	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	71.155	71.155		0	0	0	0.0677897	0.214	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685623	B18020201-001	6010.20-W-T	SAMP		2/6/2018 10:02:3	5	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	mg/L	0.82764	8.2764		0	0	0	0.2463476	0.2463476	360	0%	0	0	0%	D
Lithium	A	mg/L	0.010026	0.10026		0	0	0	0.0193332	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	13.6502	136.502		0	0	0	0.4898940	1	4500	0%	0	0	0%	
Potassium	A	mg/L	3.0334	30.334		0	0	0	0.7116101	1	900	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685623	B18020201-001	6010.20-W-T	SAMP		2/6/2018 10:02:3	5	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	B	mg/L	1.3208	13.208		0	0	0	0.0730228	0.0730228	18	0%	0	0	0%	D
Antimony	B	mg/L	0.00261	0		0	0	0	0.2852283	0.2852283	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.003268	0		0	0	0	0.0888955	0.0888955	225	0%	0	0	0%	D
Barium	B	mg/L	0.00946	0.0946		0	0	0	0.0836253	0.0836253	18	0%	0	0	0%	D
Beryllium	B	mg/L	0.000096	0		0	0	0	0.0041592	0.0041592	22.5	0%	0	0	0%	D
Boron	B	mg/L	0.009358	0		0	0	0	0.100313	0.100313	450	0%	0	0	0%	D
Cadmium	B	mg/L	0.000136	0		0	0	0	0.0154668	0.0154668	90	0%	0	0	0%	D
Calcium	B	mg/L	24.086	240.86		0	0	0	2.6092066	2.6092066	180	0%	0	0	0%	D
Chromium	B	mg/L	0.01047	0.1047		0	0	0	0.0265057	0.0265057	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.000018	0		0	0	0	0.016885	0.016885	450	0%	0	0	0%	D
Copper	B	mg/L	0.002798	0		0	0	0	0.0394582	0.0394582	225	0%	0	0	0%	D
Lead	B	mg/L	-0.000792	0		0	0	0	0.1395752	0.1395752	900	0%	0	0	0%	D
Manganese	B	mg/L	0.004402	0.04402		0	0	0	0.0392327	0.0392327	45	0%	0	0	0%	D
Molybdenum	B	mg/L	-0.00045	0		0	0	0	0.0228700	0.0228700	225	0%	0	0	0%	D
Nickel	B	mg/L	0.000366	0		0	0	0	0.0164230	0.0164230	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.008014	0		0	0	0	0.2995142	0.2995142	360	0%	0	0	0%	D
Selenium	B	mg/L	0.01546	0		0	0	0	0.2726904	0.2726904	225	0%	0	0	0%	D
Silica	B	mg/L	4.2285116	42.285116		0	0	0	0.6778966	0.6778966	1000	0%	0	0	0%	D
Silicon	B	mg/L	1.97594	19.7594		0	0	0	0.3167741	0.3167741	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	4.2285116	42.285116		0	0	0	0.6778966	0.6778966	1000	0%	0	0	0%	D
Sodium	B	mg/L	15.3176	153.176		0	0	0	4.2688267	4.2688267	4500	0%	0	0	0%	D
Strontium	B	mg/L	0.26608	2.6608		0	0	0	0.0139597	0.0139597	18	0%	0	0	0%	
Tellurium	B	mg/L	0.005386	0		0	0	0	0.2814789	0.2814789	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.00592	0		0	0	0	0.8804858	0.8804858	225	0%	0	0	0%	D
Tin	B	mg/L	-0.001104	0		0	0	0	0.0604103	0.0604103	225	0%	0	0	0%	D
Titanium	B	mg/L	0.0128	0		0	0	0	0.5311689	0.5311689	225	0%	0	0	0%	D
Uranium	B	mg/L	0.030136	0		0	0	0	1.175693	1.175693	900	0%	0	0	0%	D
Vanadium	B	mg/L	0.002762	0		0	0	0	0.0335331	0.0335331	225	0%	0	0	0%	D
Zinc	B	mg/L	0.036924	0.36924		0	0	0	0.0361556	0.0361556	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685624	B18020201-002	6010.20-W-T	SAMP		2/6/2018 10:06:2	5	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685624	B18020201-002	6010.20-W-T	SAMP		2/6/2018 10:06:2	5	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	mg/L	1.01552	5.0776		0	0	0	0.1231738	0.1231738	360	0%	0	0	0%	D
Lithium	A	mg/L	0.008368	0.04184		0	0	0	0.0096666	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	29.852	149.26		0	0	0	0.2449470	1	4500	0%	0	0	0%	
Potassium	A	mg/L	4.8208	24.104		0	0	0	0.3558050	1	900	0%	0	0	0%	
Strontium	A	mg/L	0.70718	3.5359		0	0	0	0.0069798	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00408	0		0	0	0	0.0302052	0.05	225	0%	0	0	0%	
Aluminum	B	mg/L	0.85372	4.2686		0	0	0	0.0365114	0.0365114	18	0%	0	0	0%	D
Antimony	B	mg/L	-0.00321	0		0	0	0	0.1426142	0.1426142	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.002888	0		0	0	0	0.0444478	0.0444478	225	0%	0	0	0%	D
Barium	B	mg/L	0.009842	0.04921		0	0	0	0.0418126	0.0418126	18	0%	0	0	0%	D
Beryllium	B	mg/L	0.000016	0		0	0	0	0.0020796	0.0020796	22.5	0%	0	0	0%	D
Boron	B	mg/L	0.010974	0.05487		0	0	0	0.0501565	0.0501565	450	0%	0	0	0%	
Cadmium	B	mg/L	0.000604	0		0	0	0	0.0077334	0.0077334	90	0%	0	0	0%	D
Calcium	B	mg/L	64.224	321.12		0	0	0	1.3046033	1.3046033	180	0%	0	0	0%	
Chromium	B	mg/L	0.008904	0.04452		0	0	0	0.0132528	0.0132528	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.003714	0.01857		0	0	0	0.0084425	0.0084425	450	0%	0	0	0%	D
Copper	B	mg/L	0.000124	0		0	0	0	0.0197291	0.0197291	225	0%	0	0	0%	D
Lead	B	mg/L	-0.004074	0		0	0	0	0.0697876	0.0697876	900	0%	0	0	0%	D
Manganese	B	mg/L	0.30602	1.5301		0	0	0	0.0196164	0.0196164	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.000166	0		0	0	0	0.0114350	0.0114350	225	0%	0	0	0%	D
Nickel	B	mg/L	0.00459	0.02295		0	0	0	0.0082115	0.0082115	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.013442	0		0	0	0	0.1497571	0.1497571	360	0%	0	0	0%	
Selenium	B	mg/L	0.062214	0.31107		0	0	0	0.1363452	0.1363452	225	0%	0	0	0%	D
Silica	B	mg/L	4.0094612	20.047306		0	0	0	0.3389483	0.3389483	1000	0%	0	0	0%	D
Silicon	B	mg/L	1.87358	9.3679		0	0	0	0.1583871	0.1583871	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	4.0094612	20.047306		0	0	0	0.3389483	0.3389483	1000	0%	0	0	0%	D
Sodium	B	mg/L	37.548	187.74		0	0	0	2.1344133	2.1344133	4500	0%	0	0	0%	D
Tellurium	B	mg/L	0.01076	0		0	0	0	0.1407395	0.1407395	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.0051	0		0	0	0	0.4402429	0.4402429	225	0%	0	0	0%	D
Titanium	B	mg/L	0.011354	0		0	0	0	0.2655845	0.2655845	225	0%	0	0	0%	D
Uranium	B	mg/L	0.035308	0		0	0	0	0.5878465	0.5878465	900	0%	0	0	0%	D
Vanadium	B	mg/L	0.002538	0		0	0	0	0.0167666	0.0167666	225	0%	0	0	0%	D
Zinc	B	mg/L	0.008356	0.04178		0	0	0	0.0180778	0.0180778	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685625	B18020201-003	6010.20-W-T	SAMP		2/6/2018 10:10:1	5	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	mg/L	2.6772	26.772		0	0	0	0.2463476	0.2463476	360	0%	0	0	0%	D
Lithium	A	mg/L	0.007634	0.07634		0	0	0	0.0193332	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	8.8078	88.078		0	0	0	0.4898940	1	4500	0%	0	0	0%	
Potassium	A	mg/L	2.295	22.95		0	0	0	0.7116101	1	900	0%	0	0	0%	
Aluminum	B	mg/L	3.4264	34.264		0	0	0	0.0730228	0.0730228	18	0%	0	0	0%	D
Antimony	B	mg/L	-0.000978	0		0	0	0	0.2852283	0.2852283	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.004848	0		0	0	0	0.0888955	0.0888955	225	0%	0	0	0%	D
Barium	B	mg/L	0.02385	0.2385		0	0	0	0.0836253	0.0836253	18	0%	0	0	0%	D
Beryllium	B	mg/L	0.000152	0		0	0	0	0.0041592	0.0041592	22.5	0%	0	0	0%	D
Boron	B	mg/L	0.008408	0		0	0	0	0.100313	0.100313	450	0%	0	0	0%	D
Cadmium	B	mg/L	0.000538	0		0	0	0	0.0154668	0.0154668	90	0%	0	0	0%	D
Calcium	B	mg/L	18.772	187.72		0	0	0	2.6092066	2.6092066	180	0%	0	0	0%	D
Chromium	B	mg/L	0.012512	0.12512		0	0	0	0.0265057	0.0265057	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.000792	0		0	0	0	0.016885	0.016885	450	0%	0	0	0%	D
Copper	B	mg/L	0.00255	0		0	0	0	0.0394582	0.0394582	225	0%	0	0	0%	D
Lead	B	mg/L	0.000696	0		0	0	0	0.1395752	0.1395752	900	0%	0	0	0%	D
Manganese	B	mg/L	0.020238	0.20238		0	0	0	0.0392327	0.0392327	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.00006	0		0	0	0	0.0228700	0.0228700	225	0%	0	0	0%	D
Nickel	B	mg/L	0.00227	0.0227		0	0	0	0.0164230	0.0164230	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.041806	0.41806		0	0	0	0.2995142	0.2995142	360	0%	0	0	0%	D
Selenium	B	mg/L	-0.001538	0		0	0	0	0.2726904	0.2726904	225	0%	0	0	0%	D
Silica	B	mg/L	9.356936	93.56936		0	0	0	0.6778966	0.6778966	1000	0%	0	0	0%	D
Silicon	B	mg/L	4.3724	43.724		0	0	0	0.3167741	0.3167741	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	9.356936	93.56936		0	0	0	0.6778966	0.6778966	1000	0%	0	0	0%	D
Sodium	B	mg/L	15.9856	159.856		0	0	0	4.2688267	4.2688267	4500	0%	0	0	0%	D
Strontium	B	mg/L	0.20278	2.0278		0	0	0	0.0139597	0.0139597	18	0%	0	0	0%	
Tellurium	B	mg/L	0.007646	0		0	0	0	0.2814789	0.2814789	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.003992	0		0	0	0	0.8804858	0.8804858	225	0%	0	0	0%	D
Tin	B	mg/L	0.001532	0		0	0	0	0.0604103	0.0604103	225	0%	0	0	0%	D
Titanium	B	mg/L	0.026702	0		0	0	0	0.5311689	0.5311689	225	0%	0	0	0%	D
Uranium	B	mg/L	-0.002286	0		0	0	0	1.175693	1.175693	900	0%	0	0	0%	D
Vanadium	B	mg/L	0.007284	0.07284		0	0	0	0.0335331	0.0335331	225	0%	0	0	0%	D
Zinc	B	mg/L	0.010386	0.10386		0	0	0	0.0361556	0.0361556	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685626	B18020201-004	6010.20-W-T	SAMP		2/6/2018 10:13:5	10	118187	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	mg/L	1.3076	13.076		0	0	0	0.2463476	0.2463476	360	0%	0	0	0%	D
Lithium	A	mg/L	0.029014	0.29014		0	0	0	0.0193332	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	25.253	252.53		0	0	0	0.4898940	1	4500	0%	0	0	0%	
Potassium	A	mg/L	4.1369	41.369		0	0	0	0.7116101	1	900	0%	0	0	0%	
Aluminum	B	mg/L	1.3721	13.721		0	0	0	0.0730228	0.0730228	18	0%	0	0	0%	D
Antimony	B	mg/L	0.001485	0		0	0	0	0.2852283	0.2852283	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.004421	0		0	0	0	0.0888955	0.0888955	225	0%	0	0	0%	D
Barium	B	mg/L	0.013552	0.13552		0	0	0	0.0836253	0.0836253	18	0%	0	0	0%	D
Beryllium	B	mg/L	0.000239	0		0	0	0	0.0041592	0.0041592	22.5	0%	0	0	0%	D
Boron	B	mg/L	0.012493	0.12493		0	0	0	0.100313	0.100313	450	0%	0	0	0%	D
Cadmium	B	mg/L	0.000998	0		0	0	0	0.0154668	0.0154668	90	0%	0	0	0%	D
Calcium	B	mg/L	49.5	495		0	0	0	2.6092066	2.6092066	180	0%	0	0	0%	D
Chromium	B	mg/L	0.011039	0.11039		0	0	0	0.0265057	0.0265057	225	0%	0	0	0%	D
Cobalt	B	mg/L	0.001455	0		0	0	0	0.016885	0.016885	450	0%	0	0	0%	D
Copper	B	mg/L	0.003409	0		0	0	0	0.0394582	0.0394582	225	0%	0	0	0%	D
Lead	B	mg/L	0.004127	0		0	0	0	0.1395752	0.1395752	900	0%	0	0	0%	D
Manganese	B	mg/L	0.10089	1.0089		0	0	0	0.0392327	0.0392327	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.001581	0		0	0	0	0.0228700	0.0228700	225	0%	0	0	0%	D
Nickel	B	mg/L	0.022709	0.22709		0	0	0	0.0164230	0.0164230	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.016392	0		0	0	0	0.2995142	0.2995142	360	0%	0	0	0%	D
Selenium	B	mg/L	0.058106	0.58106		0	0	0	0.2726904	0.2726904	225	0%	0	0	0%	D
Silica	B	mg/L	5.820158	58.20158		0	0	0	0.6778966	0.6778966	1000	0%	0	0	0%	D
Silicon	B	mg/L	2.7197	27.197		0	0	0	0.3167741	0.3167741	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	5.820158	58.20158		0	0	0	0.6778966	0.6778966	1000	0%	0	0	0%	D
Sodium	B	mg/L	44.871	448.71		0	0	0	4.2688267	4.2688267	4500	0%	0	0	0%	D
Strontium	B	mg/L	0.45352	4.5352		0	0	0	0.0139597	0.0139597	18	0%	0	0	0%	
Tellurium	B	mg/L	0.002711	0		0	0	0	0.2814789	0.2814789	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.003094	0		0	0	0	0.8804858	0.8804858	225	0%	0	0	0%	D
Tin	B	mg/L	0.001287	0		0	0	0	0.0604103	0.0604103	225	0%	0	0	0%	D
Titanium	B	mg/L	0.0136	0		0	0	0	0.5311689	0.5311689	225	0%	0	0	0%	D
Uranium	B	mg/L	0.018255	0		0	0	0	1.175693	1.175693	900	0%	0	0	0%	D
Vanadium	B	mg/L	0.004188	0.04188		0	0	0	0.0335331	0.0335331	225	0%	0	0	0%	D
Zinc	B	mg/L	0.62896	6.2896		0	0	0	0.0361556	0.0361556	90	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685627	MB-118202	200.7.8-W-D	MBLK		2/6/2018 10:17:4	1	R294307	2/5/2018 10:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00457	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Antimony	A	mg/L	-0.00357	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Arsenic	A	mg/L	0.00184	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	
Barium	A	mg/L	0.00006	0		0	0	0	0.0003929	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00003	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	-0.00187	0		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00065	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Calcium	A	mg/L	0.06468	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00014	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	-0.00003	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	-0.00141	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Gold	A	mg/L	-0.00232	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	
Iron	A	mg/L	0.00516	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lead	A	mg/L	-0.00607	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	
Lithium	A	mg/L	0.00025	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.01144	0		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	0.00005	0		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	A	mg/L	-0.00058	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	
Molybdenum	A	mg/L	-0.00124	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00086	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.08203	0.08203		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.11001	0.11001		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	mg/L	-0.00549	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	
Silicon	A	mg/L	0.14291	0.14291		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silver	A	mg/L	-0.00059	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	
Sodium	A	mg/L	0.144	0.144		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	mg/L	0.00016	0		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tellurium	A	mg/L	0.00695	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	
Thallium	A	mg/L	0.00213	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	A	mg/L	-0.0016	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Titanium	A	mg/L	-0.00036	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Uranium	A	mg/L	0.04398	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00157	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00144	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Calcium, meq	C	meq/L	0.00322753	0		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685627	MB-118202	200.7.8-W-D	MBLK		2/6/2018 10:17:4	1	R294307	2/5/2018 10:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron, Ferrous	C	mg/L	0.00516	0		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.00094151	0		0	0	0	0.0009592	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.00281406	0.00281406		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	0.30571307	0.30571307		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.30571307	0.30571307		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	0.006264	0.006264		0	0	0	0.0049216	0.0435	1000	0%	0	0	0%	
Uranium, Activity	C	pCi/L	29.77446	0		0	0	0	78.127319	78.127319	30465	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685628	CCV	ICP-200.7-W-D	CCV		2/6/2018 10:21:4	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5374	2.5374		2.5	0	0	0.0066084	0.1	18	101%	90	110	0%	
Antimony	A	mg/L	2.5352	2.5352		2.5	0	0	0.0356182	0.05	225	101%	90	110	0%	
Arsenic	A	mg/L	2.5589	2.5589		2.5	0	0	0.0231651	0.1	225	102%	90	110	0%	
Barium	A	mg/L	2.3739	2.3739		2.5	0	0	0.0003929	0.1	18	95%	90	110	0%	
Beryllium	A	mg/L	1.2663	1.2663		1.25	0	0	0.0002318	0.01	22.5	101%	90	110	0%	
Boron	A	mg/L	2.4875	2.4875		2.5	0	0	0.0080048	0.1	450	99%	90	110	0%	
Cadmium	A	mg/L	2.4291	2.4291		2.5	0	0	0.0010328	0.01	90	97%	90	110	0%	
Calcium	A	mg/L	25.765	25.765		25	0	0	0.1071422	1	180	103%	90	110	0%	
Chromium	A	mg/L	2.4948	2.4948		2.5	0	0	0.0010626	0.05	225	100%	90	110	0%	
Cobalt	A	mg/L	2.4146	2.4146		2.5	0	0	0.0033639	0.02	450	97%	90	110	0%	
Copper	A	mg/L	2.4072	2.4072		2.5	0	0	0.0048764	0.01	225	96%	90	110	0%	
Gold	A	mg/L	2.4019	2.4019		2.5	0	0	0.0189485	0.1	90	96%	90	110	0%	
Iron	A	mg/L	2.5998	2.5998		2.5	0	0	0.0250321	0.0250321	360	104%	90	110	0%	
Lead	A	mg/L	2.4999	2.4999		2.5	0	0	0.0187623	0.05	900	100%	90	110	0%	
Lithium	A	mg/L	1.2184	1.2184		1.25	0	0	0.0059040	0.1	22.5	97%	90	110	0%	
Magnesium	A	mg/L	24.76	24.76		25	0	0	0.0116555	1	180	99%	90	110	0%	
Manganese	A	mg/L	2.4373	2.4373		2.5	0	0	0.0010649	0.01	45	97%	90	110	0%	
Mercury	A	mg/L	1.0117	1.0117		1	0	0	0.0100947	0.02	45	101%	90	110	0%	
Molybdenum	A	mg/L	2.5388	2.5388		2.5	0	0	0.0031266	0.1	225	102%	90	110	0%	
Nickel	A	mg/L	2.409	2.409		2.5	0	0	0.0012530	0.05	225	96%	90	110	0%	
Phosphorus	A	mg/L	2.5731	2.5731		2.5	0	0	0.0425464	0.1	360	103%	90	110	0%	
Potassium	A	mg/L	24.491	24.491		25	0	0	0.0854754	1	900	98%	90	110	0%	
Selenium	A	mg/L	2.4232	2.4232		2.5	0	0	0.0234201	0.1	225	97%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685628	CCV	ICP-200.7-W-D	CCV		2/6/2018 10:21:4	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	mg/L	5.084	5.084		5	0	0	0.0487685	0.1	450	102%	90	110	0%	
Silver	A	mg/L	0.96521	0.96521		1	0	0	0.0055813	0.01	2	97%	90	110	0%	
Sodium	A	mg/L	24.8	24.8		25	0	0	0.1131395	1	450	99%	90	110	0%	
Strontium	A	mg/L	2.3722	2.3722		2.5	0	0	0.0002417	0.1	18	95%	90	110	0%	
Tellurium	A	mg/L	2.4738	2.4738		2.5	0	0	0.0301968	0.1	90	99%	90	110	0%	
Thallium	A	mg/L	2.4476	2.4476		2.5	0	0	0.0116401	0.5	225	98%	90	110	0%	
Tin	A	mg/L	2.5425	2.5425		2.5	0	0	0.0081865	0.1	225	102%	90	110	0%	
Titanium	A	mg/L	2.5	2.5		2.5	0	0	0.002716	0.01	225	100%	90	110	0%	
Uranium	A	mg/L	2.3332	2.3332		2.5	0	0	0.1154022	0.1154022	900	93%	90	110	0%	
Vanadium	A	mg/L	2.5289	2.5289		2.5	0	0	0.0036660	0.1	225	101%	90	110	0%	
Zinc	A	mg/L	2.4736	2.4736		2.5	0	0	0.0023364	0.01	90	99%	90	110	0%	
Silica	C	mg/L	10.8756928	10.8756928		10.7	0	0	0.1043257	0.21392	100	102%	90	110	0%	
Silicon as SiO2	C	mg/L	10.8756928	10.8756928		10.7	0	0	0.1043257	0.21392	0	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685629	CCB	ICP-200.7-W-D	CCB		2/6/2018 10:25:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.00005	-0.00005		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	-0.00246	-0.00246		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00011	0.00011		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.0005	0.0005		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00021	0.00021		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00168	0.00168		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00067	0.00067		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.00613	0.00613		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00001	0.00001		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00012	0.00012		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.00152	0.00152		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.00116	0.00116		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.00253	0.00253		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.00445	-0.00445		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00061	0.00061		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00452	0.00452		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00027	0.00027		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685629	CCB	ICP-200.7-W-D	CCB		2/6/2018 10:25:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Mercury	A	mg/L	0.00142	0.00142		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	0.00015	0.00015		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00043	-0.00043		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	-0.00248	-0.00248		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	-0.00217	-0.00217		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	-0.00841	-0.00841		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.0121	0.0121		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	0.00017	0.00017		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.1055	0.1055		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00046	0.00046		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.00661	0.00661		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00112	-0.00112		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	-0.00027	-0.00027		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00004	0.00004		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	0.02348	0.02348		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00101	-0.00101		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	-0.00016	-0.00016		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.02588432	0.02588432		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.02588432	0.02588432		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685630	B18020227-001	200.7.8-W-D	SAMP		2/6/2018 10:29:1	1	R294307	2/5/2018 10:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0031	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00002	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	2.6273	2.6273		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	0.80941	0.80941		0	0	0	0.1071422	1	180	0%	0	0	0%	J
Chromium	A	mg/L	-0.00003	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	-0.00007	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.0019	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Lithium	A	mg/L	0.0391	0.0391		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	0.08955	0.08955		0	0	0	0.0116555	1	180	0%	0	0	0%	J
Nickel	A	mg/L	0.00014	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.08481	0.08481		0	0	0	0.0425464	0.1	360	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685630	B18020227-001	200.7.8-W-D	SAMP		2/6/2018 10:29:1	1	R294307	2/5/2018 10:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Potassium	A	mg/L	0.50277	0.50277		0	0	0	0.0854754	1	900	0%	0	0	0%	J
Sodium	A	mg/L	44.27	44.27		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Tin	A	mg/L	-0.00074	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Titanium	A	mg/L	-0.00031	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	-0.00074	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00574	0.00574		0	0	0	0.0023364	0.01	90	0%	0	0	0%	J
Antimony	B	mg/L	-0.00149	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00273	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00042	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Iron	B	mg/L	0.00316	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	DL
Iron, Ferrous	B	mg/L	0.00316	0		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	DL
Lead	B	mg/L	-0.00577	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.00475	0.00475		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	B	mg/L	-0.00018	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Molybdenum	B	mg/L	-0.00024	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Selenium	B	mg/L	-0.01124	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.00096	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Tellurium	B	mg/L	0.01232	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00582	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Calcium, meq	C	meq/L	0.04038956	0.04038956		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	J
Magnesium, meq	C	meq/L	0.00736997	0.00736997		0	0	0	0.0009592	0.0823	1000	0%	0	0	0%	J
Potassium, meq	C	meq/L	0.01286086	0.01286086		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	J
Sodium, meq	C	meq/L	1.925745	1.925745		0	0	0	0.0096097	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685631	B18020228-001	200.7.8-W-D	SAMP		2/6/2018 10:33:1	50	R294307	2/5/2018 10:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	mg/L	9.5868	479.34		0	0	0	5.3571099	5.3571099	180	0%	0	0	0%	D
Magnesium	A	mg/L	1.02422	51.211		0	0	0	0.5827742	1	180	0%	0	0	0%	
Potassium	A	mg/L	0.80984	40.492		0	0	0	4.2737697	4.2737697	900	0%	0	0	0%	D
Sodium	A	mg/L	135.65	6782.5		0	0	0	11.045682	11.045682	4500	0%	0	0	0%	D
Aluminum	B	mg/L	0.0024312	0		0	0	0	0.3304180	0.3304180	18	0%	0	0	0%	D
Antimony	B	mg/L	0.0016772	0		0	0	0	1.7809085	1.7809085	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.0005644	0		0	0	0	1.158255	1.158255	225	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685631	B18020228-001	200.7.8-W-D	SAMP		2/6/2018 10:33:1	50	R294307	2/5/2018 10:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	B	mg/L	-0.0000098	0		0	0	0	0.0115879	0.0115879	22.5	0%	0	0	0%	D
Boron	B	mg/L	0.46306	23.153		0	0	0	0.4002421	0.4002421	450	0%	0	0	0%	D
Cadmium	B	mg/L	0.0002132	0		0	0	0	0.0516421	0.0516421	90	0%	0	0	0%	D
Chromium	B	mg/L	0.0106542	0.53271		0	0	0	0.0531309	0.0531309	225	0%	0	0	0%	D
Cobalt	B	mg/L	-0.000067	0		0	0	0	0.1681925	0.1681925	450	0%	0	0	0%	D
Copper	B	mg/L	0.0000904	0		0	0	0	0.2438217	0.2438217	225	0%	0	0	0%	D
Iron	B	mg/L	0.005046	0		0	0	0	1.2516035	1.2516035	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.005046	0		0	0	0	1.2516035	1.2516035	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.000451	0		0	0	0	0.9381132	0.9381132	900	0%	0	0	0%	D
Lithium	B	mg/L	0.141762	7.0881		0	0	0	0.2952014	0.2952014	22.5	0%	0	0	0%	D
Manganese	B	mg/L	0.059902	2.9951		0	0	0	0.0532443	0.0532443	45	0%	0	0	0%	D
Mercury	B	mg/L	0.0007318	0		0	0	0	0.5047346	0.5047346	45	0%	0	0	0%	D
Molybdenum	B	mg/L	-0.0001648	0		0	0	0	0.1563325	0.1563325	225	0%	0	0	0%	D
Nickel	B	mg/L	0.0025326	0.12663		0	0	0	0.0626522	0.0626522	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.0054326	0		0	0	0	2.1273218	2.1273218	360	0%	0	0	0%	D
Selenium	B	mg/L	-0.0137876	0		0	0	0	1.1710031	1.1710031	225	0%	0	0	0%	D
Silica	B	mg/L	1.66767754	83.3838768		0	0	0	5.2162838	5.2162838	2000	0%	0	0	0%	D
Silicon	B	mg/L	0.77958	38.979		0	0	0	2.4384274	2.4384274	450	0%	0	0	0%	D
Silicon as SiO2	B	mg/L	1.66767754	83.3838768		0	0	0	5.2162838	5.2162838	2000	0%	0	0	0%	D
Silver	B	mg/L	-0.0024498	0		0	0	0	0.2790664	0.2790664	2	0%	0	0	0%	D
Tellurium	B	mg/L	0.0142628	0		0	0	0	1.5098408	1.5098408	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.0010394	0		0	0	0	0.5820056	0.5820056	225	0%	0	0	0%	D
Tin	B	mg/L	0.000907	0		0	0	0	0.4093273	0.4093273	225	0%	0	0	0%	D
Titanium	B	mg/L	-0.0001896	0		0	0	0	0.135798	0.135798	225	0%	0	0	0%	D
Vanadium	B	mg/L	-0.0018322	0		0	0	0	0.1833008	0.1833008	225	0%	0	0	0%	D
Zinc	B	mg/L	0.00078	0		0	0	0	0.1168208	0.1168208	90	0%	0	0	0%	D
Calcium, meq	C	meq/L	0.47838132	23.919066		0	0	0	0.2673198	0.2673198	1000	0%	0	0	0%	D
Magnesium, meq	C	meq/L	0.08429331	4.2146653		0	0	0	0.0479623	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.02071571	1.03578536		0	0	0	0.1093230	0.1093230	1000	0%	0	0	0%	D
Sodium, meq	C	meq/L	5.900775	295.03875		0	0	0	0.4804872	0.4804872	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685632	B18020238-001	200.7.8-W-D	SAMP		2/6/2018 10:37:1	1	R294307	2/5/2018 10:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685632	B18020238-001	200.7.8-W-D	SAMP		2/6/2018 10:37:1	1	R294307	2/5/2018 10:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00606	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00001	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.11736	0.11736		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	32.588	32.588		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00022	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	-0.00015	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.00518	0.00518		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Lithium	A	mg/L	0.0357	0.0357		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	J
Magnesium	A	mg/L	11.97	11.97		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Nickel	A	mg/L	0.00022	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.87849	0.87849		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	9.8815	9.8815		0	0	0	0.0854754	1	900	0%	0	0	0%	
Silicon	A	mg/L	10.25	10.25		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	48.862	48.862		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Tin	A	mg/L	0.00242	0		0	0	0	0.0081865	0.01	225	0%	0	0	0%	
Titanium	A	mg/L	0.00013	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	-0.00011	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.08392	0.08392		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	-0.00336	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00748	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00063	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Lead	B	mg/L	-0.00394	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.03918	0.03918		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Mercury	B	mg/L	0.00078	0		0	0	0	0.0100947	0.0100947	45	0%	0	0	0%	DL
Molybdenum	B	mg/L	0.00262	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Selenium	B	mg/L	-0.00836	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.00183	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Tellurium	B	mg/L	0.00856	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00072	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Calcium, meq	C	meq/L	1.6261412	1.6261412		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.985131	0.985131		0	0	0	0.0019656	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.25276877	0.25276877		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	21.9268	21.9268		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	21.9268	21.9268		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	2.125497	2.125497		0	0	0	0.0096097	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685633	MB-118235	6010.20-W-D	MBLK		2/6/2018 10:40:5	1	R294307	2/6/2018 9:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00206	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Antimony	A	mg/L	-0.00631	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	
Arsenic	A	mg/L	0.00267	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	
Barium	A	mg/L	0.00003	0		0	0	0	0.0003929	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	0	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	-0.00006	0		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Cadmium	A	mg/L	0.00039	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Calcium	A	mg/L	0.0411	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00015	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	-0.00023	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.00211	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Gold	A	mg/L	-0.00425	0		0	0	0	0.0189485	0.0189485	90	0%	0	0	0%	
Iron	A	mg/L	0.00282	0		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Lead	A	mg/L	-0.00217	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	
Lithium	A	mg/L	0.00027	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.00371	0		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	mg/L	0.00009	0		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Molybdenum	A	mg/L	-0.00084	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	
Nickel	A	mg/L	-0.00067	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.07014	0.07014		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	mg/L	0.09022	0.09022		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	mg/L	-0.0065	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	
Silicon	A	mg/L	0.01359	0		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silver	A	mg/L	-0.00061	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	
Sodium	A	mg/L	0.1257	0.1257		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	mg/L	0.00003	0		0	0	0	0.0002417	0.01	18	0%	0	0	0%	
Tellurium	A	mg/L	0.01132	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	
Thallium	A	mg/L	-0.00396	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	
Tin	A	mg/L	0.00009	0		0	0	0	0.0081865	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	-0.00007	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Uranium	A	mg/L	0.0066	0		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00122	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00219	0		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.00282	0		0	0	0	0.0250321	0.03	1000	0%	0	0	0%	
Silica	C	mg/L	0.02907173	0		0	0	0	0.1043257	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685633	MB-118235	6010.20-W-D	MBLK		2/6/2018 10:40:5	1	R294307	2/6/2018 9:2	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	0.02907173	0		0	0	0	0.1043257	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685634	B18020240-006	6010.20-W-D	SAMP		2/6/2018 10:44:5	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/L	0.00001	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	-0.00028	0		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	0.03183	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00031	0		0	0	0	0.0010626	0.002	225	0%	0	0	0%	
Lithium	A	mg/L	0.00011	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	-0.0088	0		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Phosphorus	A	mg/L	0.08458	0.08458		0	0	0	0.0425464	0.1	360	0%	0	0	0%	J
Potassium	A	mg/L	0.08783	0.08783		0	0	0	0.0854754	1	900	0%	0	0	0%	J
Silicon	A	mg/L	0.02058	0		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	0.18961	0		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Tin	A	mg/L	-0.00095	0		0	0	0	0.0081865	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	-0.00017	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Aluminum	B	mg/L	0.00214	0		0	0	0	0.0066084	0.0066084	18	0%	0	0	0%	DL
Antimony	B	mg/L	-0.0008	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.0049	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00009	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Cobalt	B	mg/L	-0.00009	0		0	0	0	0.0033639	0.0033639	450	0%	0	0	0%	DL
Copper	B	mg/L	0.00016	0		0	0	0	0.0048764	0.0048764	225	0%	0	0	0%	DL
Iron	B	mg/L	0.00333	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	DL
Iron, Ferrous	B	mg/L	0.00333	0		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	DL
Lead	B	mg/L	-0.00663	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.00019	0		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Molybdenum	B	mg/L	-0.00018	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Nickel	B	mg/L	-0.00054	0		0	0	0	0.0012530	0.0012530	225	0%	0	0	0%	
Selenium	B	mg/L	-0.00362	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.0027	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Tellurium	B	mg/L	0.01291	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00536	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Vanadium	B	mg/L	-0.00196	0		0	0	0	0.0036660	0.0036660	225	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685634	B18020240-006	6010.20-W-D	SAMP		2/6/2018 10:44:5	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	B	mg/L	0.0008	0		0	0	0	0.0023364	0.0023364	90	0%	0	0	0%	DL
Silica	C	mg/L	0.04402474	0		0	0	0	0.1043257	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.04402474	0		0	0	0	0.1043257	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685635	B18020240-007	6010.20-W-D	SAMP		2/6/2018 10:48:4	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/L	-0.00002	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	-0.00018	0		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	0.03817	0		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00025	0		0	0	0	0.0010626	0.002	225	0%	0	0	0%	
Lithium	A	mg/L	0.00083	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	-0.02062	0		0	0	0	0.0238838	1	4500	0%	0	0	0%	
Phosphorus	A	mg/L	0.07432	0.07432		0	0	0	0.0425464	0.1	360	0%	0	0	0%	J
Potassium	A	mg/L	0.07115	0		0	0	0	0.0854754	1	900	0%	0	0	0%	
Silicon	A	mg/L	0.02426	0		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	0.2284	0.2284		0	0	0	0.2209136	1	4500	0%	0	0	0%	J
Tin	A	mg/L	-0.00033	0		0	0	0	0.0081865	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00022	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Zinc	A	mg/L	0.00144	0		0	0	0	0.0023364	0.0023364	90	0%	0	0	0%	L
Aluminum	B	mg/L	0.00089	0		0	0	0	0.0066084	0.0066084	18	0%	0	0	0%	DL
Antimony	B	mg/L	-0.0018	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.00305	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.0001	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Cobalt	B	mg/L	0.00046	0		0	0	0	0.0033639	0.0033639	450	0%	0	0	0%	DL
Copper	B	mg/L	-0.00289	0		0	0	0	0.0048764	0.0048764	225	0%	0	0	0%	DL
Iron	B	mg/L	0.00249	0		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	DL
Iron, Ferrous	B	mg/L	0.00249	0		0	0	0	0.0250321	0.0250321	1000	0%	0	0	0%	DL
Lead	B	mg/L	-0.00325	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.0002	0		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Molybdenum	B	mg/L	-0.00112	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Nickel	B	mg/L	-0.0006	0		0	0	0	0.0012530	0.0012530	225	0%	0	0	0%	
Selenium	B	mg/L	-0.013	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.00004	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685635	B18020240-007	6010.20-W-D	SAMP		2/6/2018 10:48:4	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tellurium	B	mg/L	0.01472	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	0.00131	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Vanadium	B	mg/L	0.00011	0		0	0	0	0.0036660	0.0036660	225	0%	0	0	0%	DL
Silica	C	mg/L	0.05189699	0		0	0	0	0.1043257	0.21392	1000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.05189699	0		0	0	0	0.1043257	0.21392	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685636	B18020242-001	200.7.8-W-D	SAMP		2/6/2018 10:52:4	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0014	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00002	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.00916	0.00916		0	0	0	0.0080048	0.05	450	0%	0	0	0%	J
Calcium	A	mg/L	0.15595	0.15595		0	0	0	0.1071422	1	180	0%	0	0	0%	J
Chromium	A	mg/L	0.00059	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	-0.00038	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.00312	0		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Iron	A	mg/L	0.0041	0		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Lithium	A	mg/L	0.00094	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.01618	0.01618		0	0	0	0.0116555	1	180	0%	0	0	0%	J
Nickel	A	mg/L	-0.00007	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.09378	0.09378		0	0	0	0.0425464	0.1	360	0%	0	0	0%	J
Potassium	A	mg/L	0.16941	0.16941		0	0	0	0.0854754	1	900	0%	0	0	0%	J
Silicon	A	mg/L	0.10095	0.10095		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	0.1823	0.1823		0	0	0	0.1131395	1	450	0%	0	0	0%	J
Tin	A	mg/L	0.00053	0		0	0	0	0.0081865	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	-0.00048	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	-0.0006	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00809	0.00809		0	0	0	0.0023364	0.01	90	0%	0	0	0%	J
Antimony	B	mg/L	-0.00246	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	-0.00152	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00055	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Lead	B	mg/L	-0.00011	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.00176	0.00176		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Molybdenum	B	mg/L	-0.00052	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685636	B18020242-001	200.7.8-W-D	SAMP		2/6/2018 10:52:4	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	B	mg/L	-0.01102	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.0016	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Tellurium	B	mg/L	0.00547	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	0.00044	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Calcium, meq	C	meq/L	0.00778191	0.00778191		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	J
Iron, Ferrous	C	mg/L	0.0041	0		0	0	0	0.0250321	0.03	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.00133161	0.00133161		0	0	0	0.0009592	0.0823	1000	0%	0	0	0%	J
Potassium, meq	C	meq/L	0.00433351	0.00433351		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	J
Silica	C	mg/L	0.21595224	0.21595224		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.21595224	0.21595224		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	0.00793005	0.00793005		0	0	0	0.0049216	0.0435	1000	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685637	B18020242-002	200.7.8-W-D	SAMP		2/6/2018 10:56:3	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0022	0		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Beryllium	A	mg/L	0	0		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	
Boron	A	mg/L	0.04064	0.04064		0	0	0	0.0080048	0.05	450	0%	0	0	0%	J
Calcium	A	mg/L	6.4289	6.4289		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00118	0.00118		0	0	0	0.0010626	0.005	225	0%	0	0	0%	J
Cobalt	A	mg/L	0.00022	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Iron	A	mg/L	0.05802	0.05802		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Lithium	A	mg/L	0.00107	0		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	mg/L	0.28814	0.28814		0	0	0	0.0116555	1	180	0%	0	0	0%	J
Nickel	A	mg/L	0.00083	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.0782	0.0782		0	0	0	0.0425464	0.1	360	0%	0	0	0%	J
Potassium	A	mg/L	0.25192	0.25192		0	0	0	0.0854754	1	900	0%	0	0	0%	J
Silicon	A	mg/L	1.3214	1.3214		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Sodium	A	mg/L	1.836	1.836		0	0	0	0.1131395	1	450	0%	0	0	0%	
Tin	A	mg/L	0.0014	0		0	0	0	0.0081865	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	0.00003	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	-0.00115	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.06782	0.06782		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Antimony	B	mg/L	-0.00417	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685637	B18020242-002	200.7.8-W-D	SAMP		2/6/2018 10:56:3	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	B	mg/L	-0.00323	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00022	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Copper	B	mg/L	0.1498	0.1498		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Lead	B	mg/L	-0.00795	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Manganese	B	mg/L	0.017	0.017		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Molybdenum	B	mg/L	-0.00031	0		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Selenium	B	mg/L	-0.01133	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.00159	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Tellurium	B	mg/L	0.00874	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.00378	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Calcium, meq	C	meq/L	0.32080211	0.32080211		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.05802	0.05802		0	0	0	0.0250321	0.03	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.02371392	0.02371392		0	0	0	0.0009592	0.0823	1000	0%	0	0	0%	J
Potassium, meq	C	meq/L	0.00644411	0.00644411		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	J
Silica	C	mg/L	2.82673888	2.82673888		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	2.82673888	2.82673888		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	0.079866	0.079866		0	0	0	0.0049216	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685638	B18020242-003	200.7.8-W-D	SAMP		2/6/2018 11:00:3	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.19103	0.19103		0	0	0	0.0066084	0.03	18	0%	0	0	0%	
Beryllium	A	mg/L	0.0004	0.0004		0	0	0	0.0002318	0.001	22.5	0%	0	0	0%	J
Boron	A	mg/L	0.59711	0.59711		0	0	0	0.0080048	0.05	450	0%	0	0	0%	
Calcium	A	mg/L	1.6307	1.6307		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	mg/L	0.00071	0		0	0	0	0.0010626	0.005	225	0%	0	0	0%	
Cobalt	A	mg/L	0.00048	0		0	0	0	0.0033639	0.005	450	0%	0	0	0%	
Copper	A	mg/L	0.01583	0.01583		0	0	0	0.0048764	0.005	225	0%	0	0	0%	
Iron	A	mg/L	0.01074	0		0	0	0	0.0250321	0.03	360	0%	0	0	0%	
Magnesium	A	mg/L	0.04504	0.04504		0	0	0	0.0116555	1	180	0%	0	0	0%	J
Manganese	A	mg/L	0.00246	0.00246		0	0	0	0.0010649	0.0010649	45	0%	0	0	0%	
Nickel	A	mg/L	-0.00112	0		0	0	0	0.0012530	0.005	225	0%	0	0	0%	
Phosphorus	A	mg/L	0.08002	0.08002		0	0	0	0.0425464	0.1	360	0%	0	0	0%	J
Potassium	A	mg/L	9.0686	9.0686		0	0	0	0.0854754	1	900	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685638	B18020242-003	200.7.8-W-D	SAMP		2/6/2018 11:00:3	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	mg/L	58.018	58.018		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Tin	A	mg/L	-0.00049	0		0	0	0	0.0081865	0.05	225	0%	0	0	0%	
Titanium	A	mg/L	-0.00003	0		0	0	0	0.002716	0.005	225	0%	0	0	0%	
Vanadium	A	mg/L	0.00088	0		0	0	0	0.0036660	0.01	225	0%	0	0	0%	
Zinc	A	mg/L	0.00823	0.00823		0	0	0	0.0023364	0.01	90	0%	0	0	0%	J
Antimony	B	mg/L	-0.00588	0		0	0	0	0.0356182	0.0356182	225	0%	0	0	0%	DL
Arsenic	B	mg/L	0.01292	0		0	0	0	0.0231651	0.0231651	225	0%	0	0	0%	DL
Cadmium	B	mg/L	0.00034	0		0	0	0	0.0010328	0.0010328	90	0%	0	0	0%	
Lead	B	mg/L	0.0019	0		0	0	0	0.0187623	0.0187623	900	0%	0	0	0%	DL
Lithium	B	mg/L	0.45446	0.45446		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Molybdenum	B	mg/L	0.00473	0.00473		0	0	0	0.0031266	0.0031266	225	0%	0	0	0%	DL
Selenium	B	mg/L	-0.00592	0		0	0	0	0.0234201	0.0234201	225	0%	0	0	0%	DL
Silver	B	mg/L	-0.00045	0		0	0	0	0.0055813	0.0055813	2	0%	0	0	0%	DL
Sodium	B	mg/L	82.763	82.763		0	0	0	0.2209136	1	4500	0%	0	0	0%	
Tellurium	B	mg/L	-0.0026	0		0	0	0	0.0301968	0.0301968	90	0%	0	0	0%	DL
Thallium	B	mg/L	-0.001	0		0	0	0	0.0116401	0.0116401	225	0%	0	0	0%	DL
Calcium, meq	C	meq/L	0.08137193	0.08137193		0	0	0	0.0053464	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.01074	0		0	0	0	0.0250321	0.03	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.00370679	0.00370679		0	0	0	0.0009592	0.0823	1000	0%	0	0	0%	J
Potassium, meq	C	meq/L	0.23197479	0.23197479		0	0	0	0.0021865	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	124.112106	124.112106		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Silicon as SiO2	C	mg/L	124.112106	124.112106		0	0	0	0.1043257	0.21392	2000	0%	0	0	0%	
Sodium, meq	C	meq/L	3.6001905	3.6001905		0	0	0	0.0096097	0.0435	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685639	B18020242-004	200.7.8-W-D	SAMP		2/6/2018 11:04:3	5	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.27316	1.3658		0	0	0	0.0400242	0.05	450	0%	0	0	0%	
Lithium	A	mg/L	0.20442	1.0221		0	0	0	0.0295201	0.1	22.5	0%	0	0	0%	
Silicon	A	mg/L	24.106	120.53		0	0	0	0.2438427	0.2438427	450	0%	0	0	0%	D
Zinc	A	mg/L	0.003316	0.01658		0	0	0	0.0116821	0.0116821	90	0%	0	0	0%	
Aluminum	B	mg/L	0.08453	0.42265		0	0	0	0.0330418	0.0330418	18	0%	0	0	0%	
Antimony	B	mg/L	0.003808	0		0	0	0	0.1780909	0.1780909	225	0%	0	0	0%	D
Arsenic	B	mg/L	0.006486	0		0	0	0	0.1158255	0.1158255	225	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685639	B18020242-004	200.7.8-W-D	SAMP		2/6/2018 11:04:3	5	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	B	mg/L	0.000146	0		0	0	0	0.0011588	0.0011588	22.5	0%	0	0	0%	
Cadmium	B	mg/L	0.00075	0		0	0	0	0.0051642	0.0051642	90	0%	0	0	0%	D
Calcium	B	mg/L	0.35604	1.7802		0	0	0	0.535711	1	180	0%	0	0	0%	
Chromium	B	mg/L	0.002722	0.01361		0	0	0	0.0053131	0.0053131	225	0%	0	0	0%	
Cobalt	B	mg/L	-0.000218	0		0	0	0	0.0168193	0.0168193	450	0%	0	0	0%	D
Copper	B	mg/L	0.00265	0		0	0	0	0.0243822	0.0243822	225	0%	0	0	0%	D
Iron	B	mg/L	0.00516	0		0	0	0	0.1251603	0.1251603	360	0%	0	0	0%	D
Iron, Ferrous	B	mg/L	0.00516	0		0	0	0	0.1251603	0.1251603	1000	0%	0	0	0%	D
Lead	B	mg/L	-0.001306	0		0	0	0	0.0938113	0.0938113	900	0%	0	0	0%	D
Magnesium	B	mg/L	0.002168	0		0	0	0	0.0582774	1	180	0%	0	0	0%	
Manganese	B	mg/L	0.00046	0		0	0	0	0.0053244	0.0053244	45	0%	0	0	0%	D
Molybdenum	B	mg/L	0.001048	0		0	0	0	0.0156332	0.0156332	225	0%	0	0	0%	D
Nickel	B	mg/L	-0.001212	0		0	0	0	0.0062652	0.0062652	225	0%	0	0	0%	D
Phosphorus	B	mg/L	0.017944	0		0	0	0	0.2127322	0.2127322	360	0%	0	0	0%	D
Potassium	B	mg/L	4.2332	21.166		0	0	0	0.427377	1	900	0%	0	0	0%	
Selenium	B	mg/L	-0.008046	0		0	0	0	0.1171003	0.1171003	225	0%	0	0	0%	D
Silver	B	mg/L	-0.000604	0		0	0	0	0.0279066	0.0279066	2	0%	0	0	0%	D
Sodium	B	mg/L	37.512	187.56		0	0	0	1.1045682	1.1045682	4500	0%	0	0	0%	
Tellurium	B	mg/L	0.004328	0		0	0	0	0.1509841	0.1509841	90	0%	0	0	0%	D
Thallium	B	mg/L	-0.001408	0		0	0	0	0.0582006	0.0582006	225	0%	0	0	0%	D
Tin	B	mg/L	-0.00058	0		0	0	0	0.0409327	0.05	225	0%	0	0	0%	
Titanium	B	mg/L	-0.000054	0		0	0	0	0.0135798	0.0135798	225	0%	0	0	0%	D
Vanadium	B	mg/L	-0.000036	0		0	0	0	0.0183301	0.0183301	225	0%	0	0	0%	D
Calcium, meq	C	meq/L	0.0177664	0.08883198		0	0	0	0.026732	0.0499	1000	0%	0	0	0%	
Magnesium, meq	C	meq/L	0.00017843	0		0	0	0	0.0047962	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0.10828526	0.54142628		0	0	0	0.0109323	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	51.5675552	257.837776		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Silicon as SiO2	C	mg/L	51.5675552	257.837776		0	0	0	0.5216284	0.5216284	2000	0%	0	0	0%	D
Sodium, meq	C	meq/L	1.631772	8.15886		0	0	0	0.0480487	0.0480487	1000	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685640	CCV	ICP-200.7-W-D	CCV		2/6/2018 11:08:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685640	CCV	ICP-200.7-W-D	CCV		2/6/2018 11:08:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.4865	2.4865		2.5	0	0	0.0066084	0.1	18	99%	90	110	0%	
Antimony	A	mg/L	2.4575	2.4575		2.5	0	0	0.0356182	0.05	225	98%	90	110	0%	
Arsenic	A	mg/L	2.4936	2.4936		2.5	0	0	0.0231651	0.1	225	100%	90	110	0%	
Barium	A	mg/L	2.2112	2.2112		2.5	0	0	0.0003929	0.1	18	88%	90	110	0%	S
Beryllium	A	mg/L	1.226	1.226		1.25	0	0	0.0002318	0.01	22.5	98%	90	110	0%	
Boron	A	mg/L	2.3811	2.3811		2.5	0	0	0.0080048	0.1	450	95%	90	110	0%	
Cadmium	A	mg/L	2.3689	2.3689		2.5	0	0	0.0010328	0.01	90	95%	90	110	0%	
Calcium	A	mg/L	25.27	25.27		25	0	0	0.1071422	1	180	101%	90	110	0%	
Chromium	A	mg/L	2.4348	2.4348		2.5	0	0	0.0010626	0.05	225	97%	90	110	0%	
Cobalt	A	mg/L	2.3613	2.3613		2.5	0	0	0.0033639	0.02	450	94%	90	110	0%	
Copper	A	mg/L	2.2872	2.2872		2.5	0	0	0.0048764	0.01	225	91%	90	110	0%	
Gold	A	mg/L	2.1869	2.1869		2.5	0	0	0.0189485	0.1	90	87%	90	110	0%	S
Iron	A	mg/L	2.5367	2.5367		2.5	0	0	0.0250321	0.0250321	360	101%	90	110	0%	
Lead	A	mg/L	2.4853	2.4853		2.5	0	0	0.0187623	0.05	900	99%	90	110	0%	
Lithium	A	mg/L	1.1345	1.1345		1.25	0	0	0.0059040	0.1	22.5	91%	90	110	0%	
Magnesium	A	mg/L	23.638	23.638		25	0	0	0.0116555	1	180	95%	90	110	0%	
Manganese	A	mg/L	2.3692	2.3692		2.5	0	0	0.0010649	0.01	45	95%	90	110	0%	
Mercury	A	mg/L	1.0013	1.0013		1	0	0	0.0100947	0.02	45	100%	90	110	0%	
Molybdenum	A	mg/L	2.4649	2.4649		2.5	0	0	0.0031266	0.1	225	99%	90	110	0%	
Nickel	A	mg/L	2.377	2.377		2.5	0	0	0.0012530	0.05	225	95%	90	110	0%	
Phosphorus	A	mg/L	2.5054	2.5054		2.5	0	0	0.0425464	0.1	360	100%	90	110	0%	
Potassium	A	mg/L	23.154	23.154		25	0	0	0.0854754	1	900	93%	90	110	0%	
Selenium	A	mg/L	2.3615	2.3615		2.5	0	0	0.0234201	0.1	225	94%	90	110	0%	
Silicon	A	mg/L	4.9256	4.9256		5	0	0	0.0487685	0.1	450	99%	90	110	0%	
Silver	A	mg/L	0.91173	0.91173		1	0	0	0.0055813	0.01	2	91%	90	110	0%	
Sodium	A	mg/L	23.32	23.32		25	0	0	0.1131395	1	450	93%	90	110	0%	
Strontium	A	mg/L	2.2153	2.2153		2.5	0	0	0.0002417	0.1	18	89%	90	110	0%	S
Tellurium	A	mg/L	2.3854	2.3854		2.5	0	0	0.0301968	0.1	90	95%	90	110	0%	
Thallium	A	mg/L	2.392	2.392		2.5	0	0	0.0116401	0.5	225	96%	90	110	0%	
Tin	A	mg/L	2.5123	2.5123		2.5	0	0	0.0081865	0.1	225	100%	90	110	0%	
Titanium	A	mg/L	2.404	2.404		2.5	0	0	0.002716	0.01	225	96%	90	110	0%	
Uranium	A	mg/L	2.174	2.174		2.5	0	0	0.1154022	0.1154022	900	87%	90	110	0%	S
Vanadium	A	mg/L	2.4446	2.4446		2.5	0	0	0.0036660	0.1	225	98%	90	110	0%	
Zinc	A	mg/L	2.4106	2.4106		2.5	0	0	0.0023364	0.01	90	96%	90	110	0%	
Silica	C	mg/L	10.5368435	10.5368435		10.7	0	0	0.1043257	0.21392	100	98%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685640	CCV	ICP-200.7-W-D	CCV		2/6/2018 11:08:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	10.5368435	10.5368435		10.7	0	0	0.1043257	0.21392	0	98%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685641	CCB	ICP-200.7-W-D	CCB		2/6/2018 11:12:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00052	0.00052		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	0.00065	0.00065		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00496	0.00496		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.00067	0.00067		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.00031	0.00031		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.00196	0.00196		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00089	0.00089		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0.01042	0.01042		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00018	0.00018		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00054	0.00054		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	-0.00138	-0.00138		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.01461	0.01461		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.00506	0.00506		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	0.00016	0.00016		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.00079	0.00079		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.00809	0.00809		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.00072	0.00072		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.00189	0.00189		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	-0.00013	-0.00013		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.00071	-0.00071		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.00378	0.00378		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.01537	0.01537		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	-0.01799	-0.01799		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.03407	0.03407		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-0.00174	-0.00174		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.121	0.121		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.00058	0.00058		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.00711	0.00711		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.00218	0.00218		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685641	CCB	ICP-200.7-W-D	CCB		2/6/2018 11:12:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.00166	0.00166		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.00123	0.00123		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	0.03556	0.03556		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-0.00128	-0.00128		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00079	0.00079		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.07288254	0.07288254		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.07288254	0.07288254		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685642	B18020242-004	200.7.8-W-D	SD		2/6/2018 11:16:0	25	R294307	2/6/2018 9:3	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0176156	0.44039		0	0	0.42265	0.1652090	0.1652090	18	0%	0	0		N
Antimony	A	mg/L	-0.0020672	0		0	0	0	0.8904543	0.8904543	225	0%	0	0		
Arsenic	A	mg/L	0.0023368	0		0	0	0	0.5791275	0.5791275	225	0%	0	0		
Barium	A	mg/L	0.0003168	0		0	0	0.00423	0.0098226	0.05	18	0%	0	0		
Beryllium	A	mg/L	0.0000988	0		0	0	0	0.0057939	0.0057939	22.5	0%	0	0		
Boron	A	mg/L	0.05244	1.311		0	0	1.3658	0.2001210	0.2001210	450	0%	0	0		N
Cadmium	A	mg/L	0.0003192	0		0	0	0	0.0258210	0.0258210	90	0%	0	0		
Calcium	A	mg/L	0.096964	0		0	0	1.7802	2.6785549	2.6785549	180	0%	0	0		
Chromium	A	mg/L	0.0080932	0.20233		0	0	0.01361	0.0265655	0.0265655	225	0%	0	0		N
Cobalt	A	mg/L	-0.000206	0		0	0	0	0.0840963	0.0840963	450	0%	0	0		
Copper	A	mg/L	0.0005168	0		0	0	0	0.1219109	0.1219109	225	0%	0	0		
Gold	A	mg/L	-0.0000948	0		0	0	0	0.4737126	0.4737126	90	0%	0	0		
Iron	A	mg/L	0.0072996	0		0	0	0	0.6258017	0.6258017	360	0%	0	0		
Lead	A	mg/L	-0.0037564	0		0	0	0	0.4690566	0.4690566	900	0%	0	0		
Lithium	A	mg/L	0.038714	0.96785		0	0	1.0221	0.1476007	0.1476007	22.5	0%	0	0		N
Magnesium	A	mg/L	0.0041468	0		0	0	0	0.2913871	1	180	0%	0	0		
Manganese	A	mg/L	-0.0000124	0		0	0	0	0.0266221	0.0266221	45	0%	0	0		
Mercury	A	mg/L	0.0008988	0		0	0	0	0.2523673	0.2523673	45	0%	0	0		
Molybdenum	A	mg/L	0.0003096	0		0	0	0	0.0781662	0.0781662	225	0%	0	0		
Nickel	A	mg/L	0.0001424	0		0	0	0	0.0313261	0.0313261	225	0%	0	0		
Phosphorus	A	mg/L	0.0022824	0		0	0	0	1.0636609	1.0636609	360	0%	0	0		
Potassium	A	mg/L	0.80096	20.024		0	0	21.166	2.1368849	2.1368849	900	0%	0	0		N
Selenium	A	mg/L	-0.0070992	0		0	0	0	0.5855016	0.5855016	225	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685642	B18020242-004	200.7.8-W-D	SD		2/6/2018 11:16:0	25	R294307	2/6/2018 9:3	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	mg/L	4.5956	114.89		0	0	120.53	1.2192137	1.2192137	450	0%	0	0	5%	
Silver	A	mg/L	-0.000754	0		0	0	0	0.1395332	0.1395332	2	0%	0	0		
Sodium	A	mg/L	7.202	180.05		0	0	187.56	5.5228412	5.5228412	4500	0%	0	0	4%	
Strontium	A	mg/L	0.0017408	0.04352		0	0	0.04128	0.0060419	0.01	18	0%	0	0		N
Tellurium	A	mg/L	0.0080536	0		0	0	0	0.7549204	0.7549204	90	0%	0	0		
Thallium	A	mg/L	-0.00116	0		0	0	0	0.2910028	0.2910028	225	0%	0	0		
Tin	A	mg/L	0.0008836	0		0	0	0	0.2046637	0.2046637	225	0%	0	0		
Titanium	A	mg/L	0.0005072	0		0	0	0	0.067899	0.067899	225	0%	0	0		
Uranium	A	mg/L	0.067188	0		0	0	0	2.8850561	2.8850561	900	0%	0	0		
Vanadium	A	mg/L	-0.0018732	0		0	0	0	0.0916504	0.0916504	225	0%	0	0		
Zinc	A	mg/L	0.001288	0		0	0	0.01658	0.0584104	0.0584104	90	0%	0	0		
Calcium, meq	C	meq/L	0.00483850	0		0	0	0.088832	0.1336599	0.1336599	1000	0%	0	0		
Iron, Ferrous	C	mg/L	0.0072996	0		0	0	0	0.6258017	0.6258017	1000	0%	0	0		
Magnesium, meq	C	meq/L	0.00034128	0		0	0	0	0.0239812	0.0823	1000	0%	0	0		
Potassium, meq	C	meq/L	0.02048856	0.51221392		0	0	0.5414263	0.0546615	0.0546615	1000	0%	0	0		N
Silica	C	mg/L	9.83090752	245.772688		0	0	257.83778	2.6081419	2.6081419	2000	0%	0	0	5%	
Silicon as SiO2	C	mg/L	9.83090752	245.772688		0	0	257.83778	2.6081419	2.6081419	2000	0%	0	0	5%	
Sodium, meq	C	meq/L	0.313287	7.832175		0	0	8.15886	0.2402436	0.2402436	1000	0%	0	0	4%	
Uranium, Activity	C	pCi/L	45.486276	0		0	0	0	1953.183	1953.183	30465	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685643	B18020242-004	200.7.8-W-D	MS2		2/6/2018 11:19:5	5.15	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.49553398	23.152		25	0.42265	0	0.0340331	0.0340331	18	91%	70	130	0%	
Antimony	A	mg/L	0.86636893	4.4618		5	0	0	0.1834336	0.1834336	225	89%	70	130	0%	
Arsenic	A	mg/L	0.90493204	4.6604		5	0	0	0.1193003	0.1193003	225	93%	70	130	0%	
Barium	A	mg/L	0	0		5	0.00423	0	0.0020235	0.05	18	0%	70	130	0%	S
Beryllium	A	mg/L	0.29267961	1.5073		2.5	0	0	0.0011935	0.0011935	22.5	60%	70	130	0%	S
Boron	A	mg/L	1.07184466	5.52		5	1.3658	0	0.0412249	0.05	450	83%	70	130	0%	
Cadmium	A	mg/L	0.42370874	2.1821		2.5	0	0	0.0053191	0.0053191	90	87%	70	130	0%	
Calcium	A	mg/L	0	0		250	1.7802	0	0.5517823	1	180	-1%	70	130	0%	S
Chromium	A	mg/L	0.85994175	4.4287		5	0.01361	0	0.0054725	0.0054725	225	88%	70	130	0%	
Cobalt	A	mg/L	0.83252427	4.2875		5	0	0	0.0173238	0.0173238	450	86%	70	130	0%	
Copper	A	mg/L	0.76794175	3.9549		5	0	0	0.0251136	0.0251136	225	79%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685643	B18020242-004	200.7.8-W-D	MS2		2/6/2018 11:19:5	5.15	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Gold	A	mg/L	0.62217476	3.2042		5	0	0	0.0975848	0.0975848	90	64%	70	130	0%	S
Iron	A	mg/L	4.39242718	22.621		25	0	0	0.1289152	0.1289152	360	90%	70	130	0%	
Lead	A	mg/L	0.89194175	4.5935		5	0	0	0.0966257	0.0966257	900	92%	70	130	0%	
Lithium	A	mg/L	0	0		5	1.0221	0	0.0304057	0.1	22.5	-20%	70	130	0%	S
Magnesium	A	mg/L	0	0		250	0	0	0.0600257	1	180	0%	70	130	0%	S
Manganese	A	mg/L	0	0		25	0	0	0.0054842	0.0054842	45	0%	70	130	0%	S
Mercury	A	mg/L	0.88778641	4.5721		5	0	0	0.0519877	0.0519877	45	91%	70	130	0%	
Molybdenum	A	mg/L	0.87132039	4.4873		5	0	0	0.0161022	0.0161022	225	90%	70	130	0%	
Nickel	A	mg/L	0.83112621	4.2803		5	0	0	0.0064532	0.0064532	225	86%	70	130	0%	
Phosphorus	A	mg/L	8.98621359	46.279		50	0	0	0.2191141	0.2191141	360	93%	70	130	0%	
Potassium	A	mg/L	0	0		250	21.166	0	0.4401983	1	900	-8%	70	130	0%	S
Selenium	A	mg/L	0.81943689	4.2201		5	0	0	0.1206133	0.1206133	225	84%	70	130	0%	
Silicon	A	mg/L	30.5048544	157.1		50	120.53	0	0.2511580	0.2511580	450	73%	70	130	0%	
Silver	A	mg/L	0.37603883	1.9366		2.5	0	0	0.0287438	0.0287438	2	77%	70	130	0%	
Sodium	A	mg/L	0	0		250	187.56	0	1.1377053	1.1377053	4500	-75%	70	130	0%	S
Strontium	A	mg/L	0	0		5	0.04128	0	0.0012446	0.01	18	-1%	70	130	0%	S
Tellurium	A	mg/L	0.85504854	4.4035		5	0	0	0.1555136	0.1555136	90	88%	70	130	0%	
Thallium	A	mg/L	0.83966990	4.3243		5	0	0	0.0599466	0.0599466	225	86%	70	130	0%	
Tin	A	mg/L	0.91079612	4.6906		5	0	0	0.0421607	0.0421607	225	94%	70	130	0%	
Titanium	A	mg/L	0.83574757	4.3041		5	0	0	0.0139872	0.0139872	225	86%	70	130	0%	
Uranium	A	mg/L	0.76213592	3.925		5	0	0	0.5943216	0.5943216	900	78%	70	130	0%	
Vanadium	A	mg/L	0.84704854	4.3623		5	0	0	0.01888	0.01888	225	87%	70	130	0%	
Zinc	A	mg/L	0.86508738	4.4552		5	0.01658	0	0.0120325	0.0120325	90	89%	70	130	0%	
Calcium, meq	C	meq/L	0	0		0	0.088832	0	0.0275339	0.0499	1000	0%	0	0	0%	
Iron, Ferrous	C	mg/L	4.39242718	22.621		25	0	0	0.1289152	0.1289152	1000	90%	70	130	0%	
Magnesium, meq	C	meq/L	0	0		0	0	0	0.0049401	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	0	0		0	0.5414263	0	0.0112603	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	65.2559845	336.06832		107	257.83778	0	0.5372772	0.5372772	2000	73%	70	130	0%	
Silicon as SiO2	C	mg/L	65.2559845	336.06832		107	257.83778	0	0.5372772	0.5372772	2000	73%	70	130	0%	
Sodium, meq	C	meq/L	0	0		0	8.15886	0	0.0494902	0.0494902	1000	0%	0	0	0%	
Uranium, Activity	C	pCi/L	515.966019	2657.225		0	0	0	402.35569	402.35569	30465	0%	0	0	0%	
Uranium, U3O8	C	mg/L		4.62757594		0	0	0	0.7007053	0.7007053	53.055	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
11685644	B18020242-004	200.7.8-W-D	MSD2		2/6/2018 11:23:3	5.15	R294307		1E+07	1E+07					

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.35728155	22.44		25	0.42265	23.152	0.0340331	0.0340331	18	88%	70	130	3%	
Antimony	A	mg/L	0.82749515	4.2616		5	0	4.4618	0.1834336	0.1834336	225	85%	70	130	5%	
Arsenic	A	mg/L	0.86502913	4.4549		5	0	4.6604	0.1193003	0.1193003	225	89%	70	130	5%	
Barium	A	mg/L	0	0		5	0.00423	0	0.0020235	0.05	18	0%	70	130		S
Beryllium	A	mg/L	0.27104854	1.3959		2.5	0	1.5073	0.0011935	0.0011935	22.5	56%	70	130	8%	S
Boron	A	mg/L	0.95801942	4.9338		5	1.3658	5.52	0.0412249	0.05	450	71%	70	130	11%	
Cadmium	A	mg/L	0.40596117	2.0907		2.5	0	2.1821	0.0053191	0.0053191	90	84%	70	130	4%	
Calcium	A	mg/L	0	0		250	1.7802	0	0.5517823	1	180	-1%	70	130		S
Chromium	A	mg/L	0.81891262	4.2174		5	0.01361	4.4287	0.0054725	0.0054725	225	84%	70	130	5%	
Cobalt	A	mg/L	0.79603883	4.0996		5	0	4.2875	0.0173238	0.0173238	450	82%	70	130	4%	
Copper	A	mg/L	0.68563107	3.531		5	0	3.9549	0.0251136	0.0251136	225	71%	70	130	11%	
Gold	A	mg/L	0.54811650	2.8228		5	0	3.2042	0.0975848	0.0975848	90	56%	70	130	13%	S
Iron	A	mg/L	3.99417476	20.57		25	0	22.621	0.1289152	0.1289152	360	82%	70	130	9%	
Lead	A	mg/L	0.87413592	4.5018		5	0	4.5935	0.0966257	0.0966257	900	90%	70	130	2%	
Lithium	A	mg/L	0	0		5	1.0221	0	0.0304057	0.1	22.5	-20%	70	130		S
Magnesium	A	mg/L	0	0		250	0	0	0.0600257	1	180	0%	70	130		S
Manganese	A	mg/L	0	0		25	0	0	0.0054842	0.0054842	45	0%	70	130		S
Mercury	A	mg/L	0.84850485	4.3698		5	0	4.5721	0.0519877	0.0519877	45	87%	70	130	5%	
Molybdenum	A	mg/L	0.83046602	4.2769		5	0	4.4873	0.0161022	0.0161022	225	86%	70	130	5%	
Nickel	A	mg/L	0.8051068	4.1463		5	0	4.2803	0.0064532	0.0064532	225	83%	70	130	3%	
Phosphorus	A	mg/L	8.55300971	44.048		50	0	46.279	0.2191141	0.2191141	360	88%	70	130	5%	
Potassium	A	mg/L	0	0		250	21.166	0	0.4401983	1	900	-8%	70	130		S
Selenium	A	mg/L	0.77234951	3.9776		5	0	4.2201	0.1206133	0.1206133	225	80%	70	130	6%	
Silicon	A	mg/L	27.5067961	141.66		50	120.53	157.1	0.2511580	0.2511580	450	42%	70	130	10%	S
Silver	A	mg/L	0.33607767	1.7308		2.5	0	1.9366	0.0287438	0.0287438	2	69%	70	130	11%	S
Sodium	A	mg/L	65.1786408	335.67		250	187.56	0	1.1377053	1.1377053	4500	59%	70	130		S
Strontium	A	mg/L	0	0		5	0.04128	0	0.0012446	0.01	18	-1%	70	130		S
Tellurium	A	mg/L	0.81469903	4.1957		5	0	4.4035	0.1555136	0.1555136	90	84%	70	130	5%	
Thallium	A	mg/L	0.80856311	4.1641		5	0	4.3243	0.0599466	0.0599466	225	83%	70	130	4%	
Tin	A	mg/L	0.8751068	4.5068		5	0	4.6906	0.0421607	0.0421607	225	90%	70	130	4%	
Titanium	A	mg/L	0.75124272	3.8689		5	0	4.3041	0.0139872	0.0139872	225	77%	70	130	11%	
Uranium	A	mg/L	0.64968932	3.3459		5	0	3.925	0.5943216	0.5943216	900	67%	70	130	16%	S
Vanadium	A	mg/L	0.76227184	3.9257		5	0	4.3623	0.01888	0.01888	225	79%	70	130	11%	
Zinc	A	mg/L	0.82565049	4.2521		5	0.01658	4.4552	0.0120325	0.0120325	90	85%	70	130	5%	
Calcium, meq	C	meq/L	0	0		0	0.088832	0	0.0275339	0.0499	1000	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685644	B18020242-004	200.7.8-W-D	MSD2		2/6/2018 11:23:3	5.15	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron, Ferrous	C	mg/L	3.99417476	20.57		25	0	22.621	0.1289152	0.1289152	1000	82%	70	130	9%	
Magnesium, meq	C	meq/L	0	0		0	0	0	0.0049401	0.0823	1000	0%	0	0		
Potassium, meq	C	meq/L	0	0		0	0.5414263	0	0.0112603	0.02558	1000	0%	0	0		
Silica	C	mg/L	58.8425383	303.039072		107	257.83778	336.06832	0.5372772	0.5372772	2000	42%	70	130	10%	S
Silicon as SiO2	C	mg/L	58.8425383	303.039072		107	257.83778	336.06832	0.5372772	0.5372772	2000	42%	70	130	10%	S
Sodium, meq	C	meq/L	2.83527087	14.601645		0	8.15886	0	0.0494902	0.0494902	1000	0%	0	0		
Uranium, Activity	C	pCi/L	439.83967	2265.1743		0	0	2657.225	402.35569	402.35569	30465	0%	0	0	16%	
Uranium, U3O8	C	mg/L		3.9448169		0	0	4.6275759	0.7007053	0.7007053	53.055	0%	0	0	16%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685645	B18020242-005	200.7.8-W-D	SAMP		2/6/2018 11:27:1	5	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685646	B18020242-006	200.7.8-W-D	SAMP		2/6/2018 11:31:0	5	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685647	B18020242-007	200.7.8-W-D	SAMP		2/6/2018 11:34:5	5	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685648	B18020242-008	200.7.8-W-D	SAMP		2/6/2018 11:38:5	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685649	B18020242-009	200.7.8-W-D	SAMP		2/6/2018 11:42:4	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685650	B18020247-001	200.7.8-W-D	SAMP		2/6/2018 11:46:3	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685651	B18020248-001	200.7.8-W-D	SAMP		2/6/2018 11:50:2	50	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685652	CCV	ICP-200.7-W-D	CCV		2/6/2018 11:54:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	1.1995	1.1995		2.5	0	0	0.0066084	0.1	18	48%	90	110	0%	S
Antimony	A	mg/L	1.0427	1.0427		2.5	0	0	0.0356182	0.05	225	42%	90	110	0%	S
Arsenic	A	mg/L	1.0851	1.0851		2.5	0	0	0.0231651	0.1	225	43%	90	110	0%	S
Barium	A	mg/L	0.00893	0.00893		2.5	0	0	0.0003929	0.1	18	0%	90	110	0%	S
Beryllium	A	mg/L	0.00242	0.00242		1.25	0	0	0.0002318	0.01	22.5	0%	90	110	0%	S
Boron	A	mg/L	0.028	0.028		2.5	0	0	0.0080048	0.1	450	1%	90	110	0%	S
Cadmium	A	mg/L	1.0461	1.0461		2.5	0	0	0.0010328	0.01	90	42%	90	110	0%	S
Calcium	A	mg/L	0.51635	0.51635		25	0	0	0.1071422	1	180	2%	90	110	0%	S
Chromium	A	mg/L	1.0394	1.0394		2.5	0	0	0.0010626	0.05	225	42%	90	110	0%	S
Cobalt	A	mg/L	1.026	1.026		2.5	0	0	0.0033639	0.02	450	41%	90	110	0%	S
Copper	A	mg/L	0.0051	0.0051		2.5	0	0	0.0048764	0.01	225	0%	90	110	0%	S
Gold	A	mg/L	0.00081	0.00081		2.5	0	0	0.0189485	0.1	90	0%	90	110	0%	S
Iron	A	mg/L	0.10855	0.10855		2.5	0	0	0.0250321	0.0250321	360	4%	90	110	0%	S
Lead	A	mg/L	1.1592	1.1592		2.5	0	0	0.0187623	0.05	900	46%	90	110	0%	S
Lithium	A	mg/L	0.00666	0.00666		1.25	0	0	0.0059040	0.1	22.5	1%	90	110	0%	S
Magnesium	A	mg/L	0.1411	0.1411		25	0	0	0.0116555	1	180	1%	90	110	0%	S
Manganese	A	mg/L	0.01295	0.01295		2.5	0	0	0.0010649	0.01	45	1%	90	110	0%	S
Mercury	A	mg/L	0.45966	0.45966		1	0	0	0.0100947	0.02	45	46%	90	110	0%	S
Molybdenum	A	mg/L	1.0272	1.0272		2.5	0	0	0.0031266	0.1	225	41%	90	110	0%	S
Nickel	A	mg/L	1.0621	1.0621		2.5	0	0	0.0012530	0.05	225	42%	90	110	0%	S
Phosphorus	A	mg/L	1.1	1.1		2.5	0	0	0.0425464	0.1	360	44%	90	110	0%	S
Potassium	A	mg/L	0.1184	0.1184		25	0	0	0.0854754	1	900	0%	90	110	0%	S
Selenium	A	mg/L	1.0046	1.0046		2.5	0	0	0.0234201	0.1	225	40%	90	110	0%	S
Silicon	A	mg/L	0.075	0.075		5	0	0	0.0487685	0.1	450	2%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685652	CCV	ICP-200.7-W-D	CCV		2/6/2018 11:54:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	-0.00133	-0.00133		1	0	0	0.0055813	0.01	2	0%	90	110	0%	S
Sodium	A	mg/L	3.275	3.275		25	0	0	0.1131395	1	450	13%	90	110	0%	S
Strontium	A	mg/L	0.02705	0.02705		2.5	0	0	0.0002417	0.1	18	1%	90	110	0%	S
Tellurium	A	mg/L	0.99654	0.99654		2.5	0	0	0.0301968	0.1	90	40%	90	110	0%	S
Thallium	A	mg/L	0.9644	0.9644		2.5	0	0	0.0116401	0.5	225	39%	90	110	0%	S
Tin	A	mg/L	1.1519	1.1519		2.5	0	0	0.0081865	0.1	225	46%	90	110	0%	S
Titanium	A	mg/L	0.00696	0.00696		2.5	0	0	0.002716	0.01	225	0%	90	110	0%	S
Uranium	A	mg/L	0.08215	0.08215		2.5	0	0	0.1154022	0.1154022	900	3%	90	110	0%	S
Vanadium	A	mg/L	0.00435	0.00435		2.5	0	0	0.0036660	0.1	225	0%	90	110	0%	S
Zinc	A	mg/L	1.0646	1.0646		2.5	0	0	0.0023364	0.01	90	43%	90	110	0%	S
Silica	C	mg/L	0.16044	0.16044		10.7	0	0	0.1043257	0.21392	100	1%	90	110	0%	S
Silicon as SiO2	C	mg/L	0.16044	0.16044		10.7	0	0	0.1043257	0.21392	0	1%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685653	CCB	ICP-200.7-W-D	CCB		2/6/2018 11:58:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01132	0.01132		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	0.01802	0.01802		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	0.00578	0.00578		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0.0588	0.0588		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	0.03505	0.03505		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	0.08664	0.08664		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	0.00584	0.00584		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	1.0209	1.0209		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.00521	0.00521		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	0.00384	0.00384		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	0.06295	0.06295		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	0.38066	0.38066		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	0.17972	0.17972		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	0.01009	0.01009		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	0.03027	0.03027		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0.74314	0.74314		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	0.07751	0.07751		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.0051	0.0051		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685653	CCB	ICP-200.7-W-D	CCB		2/6/2018 11:58:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	A	mg/L	0.00694	0.00694		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	0.00457	0.00457		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.0096	0.0096		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	0.65484	0.65484		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00015	0.00015		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	0.18615	0.18615		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	0.02465	0.02465		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0.9106	0.9106		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0.05876	0.05876		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	-0.01478	-0.01478		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	0.01397	0.01397		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	0.00397	0.00397		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	0.06969	0.06969		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	0.14464	0.14464		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	0.06792	0.06792		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.00669	0.00669		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	0.39821208	0.39821208		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	0.39821208	0.39821208		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685654	Blank	ICP-200.7-W-D	ICAL		2/7/2018 12:02:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	Cts/S	4.7375	4.7375		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Antimony	A	Cts/S	2.2932	2.2932		0	0	0	0.0356182	0.05	225	0%	0	0	0%	
Arsenic	A	Cts/S	0.2111	0.2111		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Barium	A	Cts/S	459.72	459.72		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Beryllium	A	Cts/S	229.25	229.25		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	Cts/S	34.467	34.467		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	Cts/S	8.0306	8.0306		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Calcium	A	Cts/S	395.05	395.05		0	0	0	0.1071422	1	180	0%	0	0	0%	
Chromium	A	Cts/S	3.5598	3.5598		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Cobalt	A	Cts/S	-0.64885	-0.64885		0	0	0	0.0033639	0.02	450	0%	0	0	0%	
Copper	A	Cts/S	16.967	16.967		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	Cts/S	8.05	8.05		0	0	0	0.0189485	0.1	90	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685654	Blank	ICP-200.7-W-D	ICAL		2/7/2018 12:02:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	Cts/S	139.57	139.57		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lead	A	Cts/S	5.636	5.636		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Lithium	A	Cts/S	115.37	115.37		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	Cts/S	413.22	413.22		0	0	0	0.0116555	1	180	0%	0	0	0%	
Manganese	A	Cts/S	97.55	97.55		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Mercury	A	Cts/S	1.6066	1.6066		0	0	0	0.0100947	0.02	45	0%	0	0	0%	
Molybdenum	A	Cts/S	3.1509	3.1509		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Nickel	A	Cts/S	3.8309	3.8309		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Phosphorus	A	Cts/S	3.2242	3.2242		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	Cts/S	98.619	98.619		0	0	0	0.0854754	1	900	0%	0	0	0%	
Selenium	A	Cts/S	1.1333	1.1333		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	Cts/S	38.167	38.167		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Silver	A	Cts/S	-2.2833	-2.2833		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Sodium	A	Cts/S	724.9	724.9		0	0	0	0.1131395	1	450	0%	0	0	0%	
Strontium	A	Cts/S	797.68	797.68		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tellurium	A	Cts/S	-8.6972	-8.6972		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	Cts/S	-0.25332	-0.25332		0	0	0	0.0116401	0.5	225	0%	0	0	0%	
Tin	A	Cts/S	-0.51997	-0.51997		0	0	0	0.0081865	0.1	225	0%	0	0	0%	
Titanium	A	Cts/S	190.57	190.57		0	0	0	0.002716	0.01	225	0%	0	0	0%	
Uranium	A	Cts/S	38.6	38.6		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	Cts/S	18.817	18.817		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	Cts/S	22.834	22.834		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	81.6468464	81.6468464		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685655	CalibStd-1	ICP-200.7-W-D	ICAL		2/7/2018 12:05:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Calcium	A	Cts/S	416.8	416.8		0	0	0	0.1071422	1	180	0%	0	0	0%	
Iron	A	Cts/S	147.5	147.5		0	0	0	0.0250321	0.0250321	360	0%	0	0	0%	
Lithium	A	Cts/S	115.73	115.73		0	0	0	0.0059040	0.1	22.5	0%	0	0	0%	
Magnesium	A	Cts/S	426.22	426.22		0	0	0	0.0116555	1	180	0%	0	0	0%	
Phosphorus	A	Cts/S	241.24	241.24		0	0	0	0.0425464	0.1	360	0%	0	0	0%	
Potassium	A	Cts/S	98.033	98.033		0	0	0	0.0854754	1	900	0%	0	0	0%	
Sodium	A	Cts/S	736.5	736.5		0	0	0	0.1131395	1	450	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685655	CalibStd-1	ICP-200.7-W-D	ICAL		2/7/2018 12:05:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685657	CalibStd-2	ICP-200.7-W-D	ICAL		2/7/2018 12:09:4	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	Cts/S	488.8	488.8		0	0	0	0.0066084	0.1	18	0%	0	0	0%	
Barium	A	Cts/S	455.56	455.56		0	0	0	0.0003929	0.1	18	0%	0	0	0%	
Chromium	A	Cts/S	2554.1	2554.1		0	0	0	0.0010626	0.05	225	0%	0	0	0%	
Copper	A	Cts/S	19.679	19.679		0	0	0	0.0048764	0.01	225	0%	0	0	0%	
Gold	A	Cts/S	2.8152	2.8152		0	0	0	0.0189485	0.1	90	0%	0	0	0%	
Mercury	A	Cts/S	33.682	33.682		0	0	0	0.0100947	0.02	45	0%	0	0	0%	
Nickel	A	Cts/S	2656.9	2656.9		0	0	0	0.0012530	0.05	225	0%	0	0	0%	
Silver	A	Cts/S	-5.3927	-5.3927		0	0	0	0.0055813	0.01	2	0%	0	0	0%	
Tellurium	A	Cts/S	213.31	213.31		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	Cts/S	192.23	192.23		0	0	0	0.0116401	0.5	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685658	CalibStd-3	ICP-200.7-W-D	ICAL		2/7/2018 12:13:3	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	Cts/S	227.65	227.65		0	0	0	0.0356182	0.05	225	0%	0	0	0%	
Arsenic	A	Cts/S	219.75	219.75		0	0	0	0.0231651	0.1	225	0%	0	0	0%	
Beryllium	A	Cts/S	242.26	242.26		0	0	0	0.0002318	0.01	22.5	0%	0	0	0%	
Boron	A	Cts/S	31.511	31.511		0	0	0	0.0080048	0.1	450	0%	0	0	0%	
Cadmium	A	Cts/S	4126.2	4126.2		0	0	0	0.0010328	0.01	90	0%	0	0	0%	
Cobalt	A	Cts/S	2412.2	2412.2		0	0	0	0.0033639	0.02	450	0%	0	0	0%	
Lead	A	Cts/S	508.56	508.56		0	0	0	0.0187623	0.05	900	0%	0	0	0%	
Manganese	A	Cts/S	109.23	109.23		0	0	0	0.0010649	0.01	45	0%	0	0	0%	
Molybdenum	A	Cts/S	1360.7	1360.7		0	0	0	0.0031266	0.1	225	0%	0	0	0%	
Selenium	A	Cts/S	133.75	133.75		0	0	0	0.0234201	0.1	225	0%	0	0	0%	
Silicon	A	Cts/S	41.67	41.67		0	0	0	0.0487685	0.1	450	0%	0	0	0%	
Strontium	A	Cts/S	883.4	883.4		0	0	0	0.0002417	0.1	18	0%	0	0	0%	
Tin	A	Cts/S	439.17	439.17		0	0	0	0.0081865	0.1	225	0%	0	0	0%	
Titanium	A	Cts/S	196.73	196.73		0	0	0	0.002716	0.01	225	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685658	CalibStd-3	ICP-200.7-W-D	ICAL		2/7/2018 12:13:3	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	Cts/S	7.2486	7.2486		0	0	0	0.0036660	0.1	225	0%	0	0	0%	
Zinc	A	Cts/S	5129.4	5129.4		0	0	0	0.0023364	0.01	90	0%	0	0	0%	
Silicon as SiO2	C	mg/L	89.140464	89.140464		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685659	CalibStd-4	ICP-200.7-W-D	ICAL		2/7/2018 12:17:2	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	Cts/S	35.437	35.437		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685660	CCV	ICP-200.7-W-D	CCV		2/7/2018 12:21:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.5057	2.5057		2.5	0	0	0.0066084	0.1	18	100%	90	110	0%	
Antimony	A	mg/L	2.3822	2.3822		2.5	0	0	0.0356182	0.05	225	95%	90	110	0%	
Arsenic	A	mg/L	2.2357	2.2357		2.5	0	0	0.0231651	0.1	225	89%	90	110	0%	S
Barium	A	mg/L	-246.05	-246.05		2.5	0	0	0.0003929	0.1	18	-9842%	90	110	0%	S
Beryllium	A	mg/L	17.852	17.852		1.25	0	0	0.0002318	0.01	22.5	1428%	90	110	0%	S
Boron	A	mg/L	-14.767	-14.767		2.5	0	0	0.0080048	0.1	450	-591%	90	110	0%	S
Cadmium	A	mg/L	2.2743	2.2743		2.5	0	0	0.0010328	0.01	90	91%	90	110	0%	
Calcium	A	mg/L	370.31	370.31		25	0	0	0.1071422	1	180	1481%	90	110	0%	S
Chromium	A	mg/L	2.5146	2.5146		2.5	0	0	0.0010626	0.05	225	101%	90	110	0%	
Cobalt	A	mg/L	2.2529	2.2529		2.5	0	0	0.0033639	0.02	450	90%	90	110	0%	
Copper	A	mg/L	22.776	22.776		2.5	0	0	0.0048764	0.01	225	911%	90	110	0%	S
Gold	A	mg/L	2.0644	2.0644		2.5	0	0	0.0189485	0.1	90	83%	90	110	0%	S
Iron	A	mg/L	41.196	41.196		2.5	0	0	0.0250321	0.0250321	360	1648%	90	110	0%	S
Lead	A	mg/L	2.2973	2.2973		2.5	0	0	0.0187623	0.05	900	92%	90	110	0%	
Lithium	A	mg/L	133.05	133.05		1.25	0	0	0.0059040	0.1	22.5	10644%	90	110	0%	S
Magnesium	A	mg/L	617.06	617.06		25	0	0	0.0116555	1	180	2468%	90	110	0%	S
Manganese	A	mg/L	18.87	18.87		2.5	0	0	0.0010649	0.01	45	755%	90	110	0%	S
Mercury	A	mg/L	1.0325	1.0325		1	0	0	0.0100947	0.02	45	103%	90	110	0%	
Molybdenum	A	mg/L	2.2852	2.2852		2.5	0	0	0.0031266	0.1	225	91%	90	110	0%	
Nickel	A	mg/L	2.4817	2.4817		2.5	0	0	0.0012530	0.05	225	99%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685660	CCV	ICP-200.7-W-D	CCV		2/7/2018 12:21:1	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Phosphorus	A	mg/L	2.5512	2.5512		2.5	0	0	0.0425464	0.1	360	102%	90	110	0%	
Potassium	A	mg/L	-1789.6	-1789.6		25	0	0	0.0854754	1	900	-7158%	90	110	0%	S
Selenium	A	mg/L	2.2821	2.2821		2.5	0	0	0.0234201	0.1	225	91%	90	110	0%	
Silicon	A	mg/L	11.906	11.906		5	0	0	0.0487685	0.1	450	238%	90	110	0%	S
Silver	A	mg/L	0.22688	0.22688		1	0	0	0.0055813	0.01	2	23%	90	110	0%	S
Sodium	A	mg/L	1115	1115		25	0	0	0.1131395	1	450	4460%	90	110	0%	S
Strontium	A	mg/L	20.907	20.907		2.5	0	0	0.0002417	0.1	18	836%	90	110	0%	S
Tellurium	A	mg/L	2.495	2.495		2.5	0	0	0.0301968	0.1	90	100%	90	110	0%	
Thallium	A	mg/L	2.4333	2.4333		2.5	0	0	0.0116401	0.5	225	97%	90	110	0%	
Tin	A	mg/L	2.1806	2.1806		2.5	0	0	0.0081865	0.1	225	87%	90	110	0%	S
Titanium	A	mg/L	27.509	27.509		2.5	0	0	0.002716	0.01	225	1100%	90	110	0%	S
Uranium	A	mg/L	-80.462	-80.462		2.5	0	0	0.1154022	0.1154022	900	-3218%	90	110	0%	S
Vanadium	A	mg/L	-1.2622	-1.2622		2.5	0	0	0.0036660	0.1	225	-50%	90	110	0%	S
Zinc	A	mg/L	2.2749	2.2749		2.5	0	0	0.0023364	0.01	90	91%	90	110	0%	
Silica	C	mg/L	25.4693152	25.4693152		10.7	0	0	0.1043257	0.21392	100	238%	90	110	0%	S
Silicon as SiO2	C	mg/L	25.4693152	25.4693152		10.7	0	0	0.1043257	0.21392	0	238%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685661	CCB	ICP-200.7-W-D	CCB		2/7/2018 12:25:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.06372	0.06372		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	2.0886	2.0886		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	-4.1607	-4.1607		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	-16756	-16756		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	1519.6	1519.6		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	-539.2	-539.2		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	-0.02571	-0.02571		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	6939.6	6939.6		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	0.03505	0.03505		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	-2.6292	-2.6292		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	573.81	573.81		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	-307.53	-307.53		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	217.82	217.82		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.56317	-0.56317		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685661	CCB	ICP-200.7-W-D	CCB		2/7/2018 12:25:0	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lithium	A	mg/L	7451.3	7451.3		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	23109	23109		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	658.78	658.78		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	0.10992	0.10992		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	-0.11513	-0.11513		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	-0.13181	-0.13181		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	0.81234	0.81234		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	-69931	-69931		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	-0.36946	-0.36946		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	377.16	377.16		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-8.4862	-8.4862		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	16370	16370		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	2349.3	2349.3		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	0.60027	0.60027		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-1.7343	-1.7343		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	-0.01807	-0.01807		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	1123.3	1123.3		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-38	-38		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-171.57	-171.57		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	0.14932	0.14932		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	806.820672	806.820672		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	
Silicon as SiO2	C	mg/L	806.820672	806.820672		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685662	B18020249-001	200.7.8-W-D	SAMP		2/7/2018 12:28:5	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685663	B18020249-002	200.7.8-W-D	SAMP		2/7/2018 12:32:4	1	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
11685664	B18020249-002	200.7.8-W-D	MS2		2/7/2018 12:36:3	1.03	R294307		1E+07	0					

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.75097087	4.8935		5	0.0134	0	0.0068066	0.03	18	98%	70	130	0%	
Antimony	A	mg/L	0.79324272	0.81704		1	0	0	0.0366867	0.0366867	225	82%	70	130	0%	
Arsenic	A	mg/L	0.86017476	0.88598		1	0.04175	0	0.0238601	0.0238601	225	84%	70	130	0%	
Barium	A	mg/L	-701.65049	0		1	0	0	0.0004047	0.05	18	0%	70	130	0%	S
Beryllium	A	mg/L	10.7611650	11.084		0.5	0	0	0.0002387	0.001	22.5	2217%	70	130	0%	S
Boron	A	mg/L	-6.6328155	0		1	0	0	0.008245	0.05	450	0%	70	130	0%	S
Cadmium	A	mg/L	0.42152427	0.43417		0.5	0	0	0.0010638	0.0010638	90	87%	70	130	0%	
Calcium	A	mg/L	0	0		50	12113	0	0.1103565	1	180	-24226%	70	130	0%	S
Chromium	A	mg/L	0.95098058	0.97951		1	0	0	0.0010945	0.005	225	98%	70	130	0%	
Cobalt	A	mg/L	0.82935922	0.85424		1	0.02032	0	0.0034648	0.005	450	83%	70	130	0%	
Copper	A	mg/L	3.15203883	3.2466		1	7.3552	0	0.0050227	0.0050227	225		70	130	0%	A
Gold	A	mg/L	4.4223301	4.555		1	6.7175	0	0.019517	0.019517	90		70	130	0%	A
Iron	A	mg/L	29.6223301	30.511		5	0	0	0.0257830	0.0257830	360	610%	70	130	0%	S
Lead	A	mg/L	0.8773301	0.90365		1	0	0	0.0193251	0.0193251	900	90%	70	130	0%	
Lithium	A	mg/L	63.723301	65.635		1	0	0	0.0060811	0.1	22.5	6564%	70	130	0%	S
Magnesium	A	mg/L	-3706.4078	0		50	0	0	0.0246003	1	4500	0%	70	130	0%	S
Manganese	A	mg/L	13.8407767	14.256		5	0.04721	0	0.0010968	0.0010968	45	284%	70	130	0%	S
Mercury	A	mg/L	0.96647573	0.99547		1	0	0	0.0103975	0.0103975	45	100%	70	130	0%	
Molybdenum	A	mg/L	0.84219417	0.86746		1	0	0	0.0032204	0.0032204	225	87%	70	130	0%	
Nickel	A	mg/L	0.81396117	0.83838		1	0	0	0.0012906	0.005	225	84%	70	130	0%	
Phosphorus	A	mg/L	10.0223301	10.323		10	0.10179	0	0.0438228	0.1	360	102%	70	130	0%	
Potassium	A	mg/L	-8572.3301	0		50	0	0	0.0880397	1	900	0%	70	130	0%	S
Selenium	A	mg/L	0.85582524	0.8815		1	0	0	0.0241227	0.0241227	225	88%	70	130	0%	
Silicon	A	mg/L	517.815534	533.35		10	738.74	0	0.0502316	0.1	450		70	130	0%	A
Silver	A	mg/L	0.04932039	0.0508		0.5	0	0	0.0057488	0.0057488	2	10%	70	130	0%	S
Sodium	A	mg/L	-449.00971	0		50	0	0	0.2275411	1	4500	0%	70	130	0%	S
Strontium	A	mg/L	137.553398	141.68		1	69.856	0	0.0002489	0.01	18		70	130	0%	A
Tellurium	A	mg/L	0.94886408	0.97733		1	0	0	0.0311027	0.0311027	90	98%	70	130	0%	
Thallium	A	mg/L	0.93809709	0.96624		1	0.01566	0	0.0119893	0.0119893	225	95%	70	130	0%	
Tin	A	mg/L	0.84011650	0.86532		1	0	0	0.0084321	0.01	225	87%	70	130	0%	
Titanium	A	mg/L	20.5213592	21.137		1	3.8879	0	0.0027974	0.005	225	1725%	70	130	0%	S
Uranium	A	mg/L	-42.633981	0		1	0	0	0.1188643	0.1188643	900	0%	70	130	0%	S
Vanadium	A	mg/L	-1.4752427	0		1	0.75554	0	0.003776	0.01	225	-76%	70	130	0%	S
Zinc	A	mg/L	0.88501942	0.91157		1	0	0	0.0024065	0.01	90	91%	70	130	0%	
Calcium, meq	C	meq/L	0	0		0	0	0	0.0055068	0.0499	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685664	B18020249-002	200.7.8-W-D	MS2		2/7/2018 12:36:3	1.03	R294307		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron, Ferrous	C	mg/L	29.6223301	30.511		5	0	0	0.0257830	0.0257830	1000	610%	70	130	0%	S
Magnesium, meq	C	meq/L	-305.03736	0		0	0	0	0.0020246	0.0823	1000	0%	0	0	0%	
Potassium, meq	C	meq/L	-219.28020	0		0	0	0	0.0022521	0.02558	1000	0%	0	0	0%	
Silica	C	mg/L	1107.71099	1140.94232		21.4	0	0	0.1074554	0.21392	2000	5332%	70	130	0%	S
Silicon as SiO2	C	mg/L	1107.71099	1140.94232		21.4	0	0	0.1074554	0.21392	2000	5332%	70	130	0%	S
Sodium, meq	C	meq/L	-19.531922	0		0	0	0	0.0098980	0.0435	1000	0%	0	0	0%	
Uranium, Activity	C	pCi/L	-28863.205	0		0	0	0	80.471138	80.471138	30465	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685665	B18020249-002	200.7.8-W-D	MSD2		2/7/2018 12:40:2	1.03	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	3.18407767	3.2796		5	0.0134	4.8935	0.0068066	0.03	18	65%	70	130	39%	SR
Antimony	A	mg/L	0.96215534	0.99102		1	0	0.81704	0.0366867	0.0366867	225	99%	70	130	19%	
Arsenic	A	mg/L	-0.810835	0		1	0.04175	0.88598	0.0238601	0.0238601	225	-4%	70	130		S
Barium	A	mg/L	0	0		1	0	0	0.0004047	0.05	18	0%	70	130		S
Beryllium	A	mg/L	1902.91262	1960		0.5	0	11.084	0.0002387	0.001	22.5	392000%	70	130	198%	SR
Boron	A	mg/L	-773.68932	0		1	0	0	0.008245	0.05	450	0%	70	130		S
Cadmium	A	mg/L	0.25772816	0.26546		0.5	0	0.43417	0.0010638	0.0010638	90	53%	70	130	48%	SR
Calcium	A	mg/L	0	0		50	12113	0	0.1103565	1	180	-24226%	70	130		S
Chromium	A	mg/L	0.63261165	0.65159		1	0	0.97951	0.0010945	0.005	225	65%	70	130	40%	SR
Cobalt	A	mg/L	-3.5578641	0		1	0.02032	0.85424	0.0034648	0.005	450	-2%	70	130		S
Copper	A	mg/L	838.495146	863.65		1	7.3552	3.2466	0.0050227	0.0050227	225		70	130	199%	AR
Gold	A	mg/L	-146.90291	0		1	6.7175	4.555	0.019517	0.019517	90	-672%	70	130		S
Iron	A	mg/L	1282.81553	1321.3		5	0	30.511	0.0257830	0.0257830	360	26426%	70	130	191%	SR
Lead	A	mg/L	-0.2287282	0		1	0	0.90365	0.0193251	0.0193251	900	0%	70	130		S
Lithium	A	mg/L	0	0		1	0	65.635	0.0060811	0.1	22.5	0%	70	130		S
Magnesium	A	mg/L	-55456.311	0		50	0	0	0.0246003	1	4500	0%	70	130		S
Manganese	A	mg/L	0	0		5	0.04721	14.256	0.0010968	0.0010968	45	-1%	70	130		S
Mercury	A	mg/L	0.76465049	0.78759		1	0	0.99547	0.0103975	0.0103975	45	79%	70	130	23%	
Molybdenum	A	mg/L	0.34414563	0.35447		1	0	0.86746	0.0032204	0.0032204	225	35%	70	130	84%	SR
Nickel	A	mg/L	-0.4974951	0		1	0	0.83838	0.0012906	0.005	225	0%	70	130		S
Phosphorus	A	mg/L	7.07252427	7.2847		10	0.10179	10.323	0.0438228	0.1	360	72%	70	130	35%	R
Potassium	A	mg/L	0	0		50	0	0	0.0880397	1	900	0%	70	130		S
Selenium	A	mg/L	-0.0508155	0		1	0	0.8815	0.0241227	0.0241227	225	0%	70	130		S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685665	B18020249-002	200.7.8-W-D	MSD2		2/7/2018 12:40:2	1.03	R294307		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon	A	mg/L	4765.04854	4908		10	738.74	533.35	0.0502316	0.1	450		70	130	161%	AR
Silver	A	mg/L	-25.833981	0		0.5	0	0.0508	0.0057488	0.0057488	2	0%	70	130		S
Sodium	A	mg/L	-9854.3689	0		50	0	0	0.2275411	1	4500	0%	70	130		S
Strontium	A	mg/L	0	0		1	69.856	141.68	0.0002489	0.01	18	-6986%	70	130		S
Tellurium	A	mg/L	1.53990291	1.5861		1	0	0.97733	0.0311027	0.0311027	90	159%	70	130	47%	SR
Thallium	A	mg/L	-2.1335922	0		1	0.01566	0.96624	0.0119893	0.0119893	225	-2%	70	130		S
Tin	A	mg/L	0.51722330	0.53274		1	0	0.86532	0.0084321	0.01	225	53%	70	130	48%	SR
Titanium	A	mg/L	1725.63107	1777.4		1	3.8879	21.137	0.0027974	0.005	225	177351%	70	130	195%	SR
Uranium	A	mg/L	-101.21359	0		1	0	0	0.1188643	0.1188643	900	0%	70	130		S
Vanadium	A	mg/L	-269.84466	0		1	0.75554	0	0.003776	0.01	225	-76%	70	130		S
Zinc	A	mg/L	0.20697087	0.21318		1	0	0.91157	0.0024065	0.01	90	21%	70	130	124%	SR
Calcium, meq	C	meq/L	0	0		0	0	0	0.0055068	0.0499	1000	0%	0	0		
Iron, Ferrous	C	mg/L	1282.81553	1321.3		5	0	30.511	0.0257830	0.0257830	1000	26426%	70	130	191%	SR
Magnesium, meq	C	meq/L	-4564.0544	0		0	0	0	0.0020246	0.0823	1000	0%	0	0		
Potassium, meq	C	meq/L	0	0		0	0	0	0.0022521	0.02558	1000	0%	0	0		
Silica	C	mg/L	10193.3918	10499.1936		21.4	0	1140.9423	0.1074554	0.21392	2000	49062%	70	130	161%	SR
Silicon as SiO2	C	mg/L	10193.3918	10499.1936		21.4	0	1140.9423	0.1074554	0.21392	2000	49062%	70	130	161%	SR
Sodium, meq	C	meq/L	-428.66505	0		0	0	0	0.0098980	0.0435	1000	0%	0	0		
Uranium, Activity	C	pCi/L	-68521.602	0		0	0	0	80.471138	80.471138	30465	0%	0	0		

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685666	B18020271-001	200.7.8-W-D	SAMP		2/7/2018 12:44:1	5	R294307	2/6/2018 9:3	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685667	CCV	ICP-200.7-W-D	CCV		2/7/2018 12:47:5	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.02432	-0.02432		2.5	0	0	0.0066084	0.1	18	-1%	90	110	0%	S
Antimony	A	mg/L	-0.04771	-0.04771		2.5	0	0	0.0356182	0.05	225	-2%	90	110	0%	S
Arsenic	A	mg/L	0.17476	0.17476		2.5	0	0	0.0231651	0.1	225	7%	90	110	0%	S
Barium	A	mg/L	0	0		2.5	0	0	0.0003929	0.1	18	0%	90	110	0%	S
Beryllium	A	mg/L	-42.599	-42.599		1.25	0	0	0.0002318	0.01	22.5	-3408%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist				
11685667	CCV	ICP-200.7-W-D	CCV		2/7/2018 12:47:5	1	R294307		0	0					

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	-259.62	-259.62		2.5	0	0	0.0080048	0.1	450	-10385%	90	110	0%	S
Cadmium	A	mg/L	-0.03242	-0.03242		2.5	0	0	0.0010328	0.01	90	-1%	90	110	0%	S
Calcium	A	mg/L	26261	26261		25	0	0	0.1071422	1	180	105044%	90	110	0%	S
Chromium	A	mg/L	-0.00269	-0.00269		2.5	0	0	0.0010626	0.05	225	0%	90	110	0%	S
Cobalt	A	mg/L	0.08093	0.08093		2.5	0	0	0.0033639	0.02	450	3%	90	110	0%	S
Copper	A	mg/L	-24.907	-24.907		2.5	0	0	0.0048764	0.01	225	-996%	90	110	0%	S
Gold	A	mg/L	7.1041	7.1041		2.5	0	0	0.0189485	0.1	90	284%	90	110	0%	S
Iron	A	mg/L	-85.456	-85.456		2.5	0	0	0.0250321	0.0250321	360	-3418%	90	110	0%	S
Lead	A	mg/L	0.03487	0.03487		2.5	0	0	0.0187623	0.05	900	1%	90	110	0%	S
Lithium	A	mg/L	14349	14349		1.25	0	0	0.0059040	0.1	22.5	147920%	90	110	0%	S
Magnesium	A	mg/L	39252	39252		25	0	0	0.0116555	1	180	157008%	90	110	0%	S
Manganese	A	mg/L	-30.024	-30.024		2.5	0	0	0.0010649	0.01	45	-1201%	90	110	0%	S
Mercury	A	mg/L	-0.00429	-0.00429		1	0	0	0.0100947	0.02	45	0%	90	110	0%	S
Molybdenum	A	mg/L	0.00309	0.00309		2.5	0	0	0.0031266	0.1	225	0%	90	110	0%	S
Nickel	A	mg/L	-0.07334	-0.07334		2.5	0	0	0.0012530	0.05	225	-3%	90	110	0%	S
Phosphorus	A	mg/L	-0.02814	-0.02814		2.5	0	0	0.0425464	0.1	360	-1%	90	110	0%	S
Potassium	A	mg/L	-143840	-143840		25	0	0	0.0854754	1	900	-575360%	90	110	0%	S
Selenium	A	mg/L	0.08878	0.08878		2.5	0	0	0.0234201	0.1	225	4%	90	110	0%	S
Silicon	A	mg/L	364.47	364.47		5	0	0	0.0487685	0.1	450	7289%	90	110	0%	S
Silver	A	mg/L	0.74332	0.74332		1	0	0	0.0055813	0.01	2	74%	90	110	0%	S
Sodium	A	mg/L	0	0		25	0	0	0.1131395	1	450	0%	90	110	0%	S
Strontium	A	mg/L	0	0		2.5	0	0	0.0002417	0.1	18	0%	90	110	0%	S
Tellurium	A	mg/L	-0.07685	-0.07685		2.5	0	0	0.0301968	0.1	90	-3%	90	110	0%	S
Thallium	A	mg/L	0.06405	0.06405		2.5	0	0	0.0116401	0.5	225	3%	90	110	0%	S
Tin	A	mg/L	-0.02076	-0.02076		2.5	0	0	0.0081865	0.1	225	-1%	90	110	0%	S
Titanium	A	mg/L	-29.19	-29.19		2.5	0	0	0.002716	0.01	225	-1168%	90	110	0%	S
Uranium	A	mg/L	-36.39	-36.39		2.5	0	0	0.1154022	0.1154022	900	-1456%	90	110	0%	S
Vanadium	A	mg/L	4.3077	4.3077		2.5	0	0	0.0036660	0.1	225	172%	90	110	0%	S
Zinc	A	mg/L	-0.00114	-0.00114		2.5	0	0	0.0023364	0.01	90	0%	90	110	0%	S
Silica	C	mg/L	779.674224	779.674224		10.7	0	0	0.1043257	0.21392	100	7287%	90	110	0%	S
Silicon as SiO2	C	mg/L	779.674224	779.674224		10.7	0	0	0.1043257	0.21392	0	7287%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685668	CCB	ICP-200.7-W-D	CCB		2/7/2018 12:51:4	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.8874	2.8874		0	0	0	0.0066084	0.1	18	0%	-0.05	0.05	0%	
Antimony	A	mg/L	15.42	15.42		0	0	0	0.0356182	0.05	225	0%	-0.05	0.05	0%	
Arsenic	A	mg/L	-23.746	-23.746		0	0	0	0.0231651	0.1	225	0%	-0.1	0.1	0%	
Barium	A	mg/L	0	0		0	0	0	0.0003929	0.1	18	0%	-0.005	0.005	0%	
Beryllium	A	mg/L	9458.8	9458.8		0	0	0	0.0002318	0.01	22.5	0%	-0.001	0.001	0%	
Boron	A	mg/L	-2929.9	-2929.9		0	0	0	0.0080048	0.1	450	0%	-0.05	0.05	0%	
Cadmium	A	mg/L	2.16	2.16		0	0	0	0.0010328	0.01	90	0%	-0.001	0.001	0%	
Calcium	A	mg/L	0	0		0	0	0	0.1071422	1	180	0%	-0.1	0.1	0%	
Chromium	A	mg/L	2.6771	2.6771		0	0	0	0.0010626	0.05	225	0%	-0.005	0.005	0%	
Cobalt	A	mg/L	-13.193	-13.193		0	0	0	0.0033639	0.02	450	0%	-0.01	0.01	0%	
Copper	A	mg/L	3363.3	3363.3		0	0	0	0.0048764	0.01	225	0%	-0.005	0.005	0%	
Gold	A	mg/L	-204.48	-204.48		0	0	0	0.0189485	0.1	90	0%	-0.005	0.01	0%	
Iron	A	mg/L	960.08	960.08		0	0	0	0.0250321	0.0250321	360	0%	-0.005	0.005	0%	
Lead	A	mg/L	-0.90247	-0.90247		0	0	0	0.0187623	0.05	900	0%	-0.01	0.01	0%	
Lithium	A	mg/L	45618	45618		0	0	0	0.0059040	0.1	22.5	0%	-0.01	0.01	0%	
Magnesium	A	mg/L	0	0		0	0	0	0.0116555	1	180	0%	-0.1	0.1	0%	
Manganese	A	mg/L	3986.8	3986.8		0	0	0	0.0010649	0.01	45	0%	-0.001	0.001	0%	
Mercury	A	mg/L	1.7486	1.7486		0	0	0	0.0100947	0.02	45	0%	-0.1	0.1	0%	
Molybdenum	A	mg/L	1.551	1.551		0	0	0	0.0031266	0.1	225	0%	-0.005	0.005	0%	
Nickel	A	mg/L	1.6512	1.6512		0	0	0	0.0012530	0.05	225	0%	-0.01	0.01	0%	
Phosphorus	A	mg/L	7.3806	7.3806		0	0	0	0.0425464	0.1	360	0%	-0.05	0.05	0%	
Potassium	A	mg/L	-423020	-423020		0	0	0	0.0854754	1	900	0%	-0.1	0.1	0%	
Selenium	A	mg/L	0.00046	0.00046		0	0	0	0.0234201	0.1	225	0%	-0.1	0.1	0%	
Silicon	A	mg/L	2166	2166		0	0	0	0.0487685	0.1	450	0%	-0.05	0.05	0%	
Silver	A	mg/L	-52.153	-52.153		0	0	0	0.0055813	0.01	2	0%	-0.005	0.005	0%	
Sodium	A	mg/L	0	0		0	0	0	0.1131395	1	450	0%	-0.1	0.1	0%	
Strontium	A	mg/L	0	0		0	0	0	0.0002417	0.1	18	0%	-0.005	0.005	0%	
Tellurium	A	mg/L	6.4292	6.4292		0	0	0	0.0301968	0.1	90	0%	0	0	0%	
Thallium	A	mg/L	-7.7939	-7.7939		0	0	0	0.0116401	0.5	225	0%	-0.1	0.1	0%	
Tin	A	mg/L	2.082	2.082		0	0	0	0.0081865	0.1	225	0%	-0.1	0.1	0%	
Titanium	A	mg/L	6785.1	6785.1		0	0	0	0.002716	0.01	225	0%	-0.01	0.01	0%	
Uranium	A	mg/L	-280.4	-280.4		0	0	0	0.1154022	0.1154022	900	0%	0	0	0%	
Vanadium	A	mg/L	-1074.3	-1074.3		0	0	0	0.0036660	0.1	225	0%	-0.01	0.01	0%	
Zinc	A	mg/L	3.1835	3.1835		0	0	0	0.0023364	0.01	90	0%	-0.005	0.005	0%	
Silica	C	mg/L	4633.5072	4633.5072		0	0	0	0.1043257	0.21392	100	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685668	CCB	ICP-200.7-W-D	CCB		2/7/2018 12:51:4	1	R294307		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silicon as SiO2	C	mg/L	4633.5072	4633.5072		0	0	0	0.1043257	0.21392	0	0%	0	0	0%	

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=Blank
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 10:41:16
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	Cts/S	2.0848	2.6712	128.13	5.0061	-0.23333	1.4818
Ca3181	Cts/S	10.259	1.1548	11.256	10.8	8.9333	11.044
Mg2790	Cts/S	5.4833	1.5893	28.984	7.3	4.35	4.8
Mg2852	Cts/S	8.4667	5.1357	60.658	12.15	10.65	2.6
K_7664	Cts/S	47.667	1.4331	3.0065	47.378	46.4	49.222
K_7698	Cts/S	170.47	4.6049	2.7012	169.66	166.33	175.43
Na5895	Cts/S	91.28	12.42	13.61	79.99	104.6	89.26
Na8183	Cts/S	132.56	0.61854	0.46663	131.97	132.5	133.2
Ag3280	Cts/S	-3.45	1.0817	31.353	-3.15	-4.65	-2.55
Al1670	Cts/S	0.31553	0.30361	96.222	0.02	0.62662	0.29998
Al3961	Cts/S	60.617	12.4	20.456	46.35	68.8	66.7
As1890	Cts/S	-0.12666	0.15069	118.98	-0.22665	0.04666	-0.19999
As1937	Cts/S	-1.012	0.21295	21.043	-1.2299	-1.0016	-0.80439
Au2427	Cts/S	1.6333	1.7265	105.7	2.8	2.45	-0.35
Au2675	Cts/S	-4.9	1.1822	24.126	-3.55	-5.75	-5.4
B_2089	Cts/S	5.4485	0.29098	5.3406	5.7063	5.5063	5.133
B_2497	Cts/S	8.7833	1.9393	22.079	11	7.95	7.4
Ba4554	Cts/S	19.3	13.253	68.666	17.4	33.4	7.1

Ba2347	Cts/S	6.2667	0.27538	4.3943	6.45	5.95	6.4
Be3130	Cts/S	i 13.867	4.5234	32.62	i 16.700	i 8.6500	i 16.250
Be3131	Cts/S	i -14.450	0.0866	0.59933	i -14.400	i -14.400	i -14.550
Cd2144	Cts/S	8.8972	0.63308	7.1156	9.0883	9.4127	8.1906
Cd2288	Cts/S	2.9376	0.59004	20.086	3.5864	2.4332	2.7931
Co2286	Cts/S	-2.3598	0.19217	8.1432	-2.1865	-2.5665	-2.3265
Co2388	Cts/S	-1.4643	2.7308	186.5	-2.9143	-3.1643	1.6857
Cr2055	Cts/S	-0.35109	0.61605	175.47	-0.57996	0.34664	-0.81995
Cr2666	Cts/S	7.6	1.7088	22.484	6	9.4	7.4
Cr2677	Cts/S	1.0778	1.7312	160.63	0.7	-0.43333	2.9667
Cu2199	Cts/S	-2.5643	0.63834	24.893	-2.3598	-2.0532	-3.2798
Cu3247	Cts/S	8.6667	2.0421	23.562	9.3667	6.3667	10.267
Cu3273	Cts/S	8.75	4.912	56.137	10.3	12.7	3.25
Fe2599	Cts/S	0.95	1.711	180.1	1.65	-1	2.2
Fe2714	Cts/S	5.9	3.6428	61.742	1.7	8.2	7.8
Hg1849	Cts/S	0.94216	0.60785	64.516	1.5266	0.9866	0.31331
Hg1942	Cts/S	-0.13777	0.24569	178.33	-0.22665	0.13999	-0.32664
Li6707	Cts/S	60.159	1.8393	3.0573	58.411	59.989	62.078
Mn2576	Cts/S	5.0833	0.79739	15.686	4.2	5.75	5.3
Mn2593	Cts/S	-1.2667	1.8468	145.8	0.85	-2.55	-2.1
Mn4033	Cts/S	242.6	6.9619	2.8697	244.45	234.9	248.45
Mo2020	Cts/S	1.3866	0.02404	1.7334	1.3799	1.3666	1.4132
Mo2816	Cts/S	-8	2.3065	28.831	-10.2	-5.6	-8.2
Ni2216	Cts/S	1.231	1.6806	136.52	-0.5333	1.4132	2.8131
Ni2303	Cts/S	-2.2487	1.094	48.649	-2.4732	-3.2131	-1.0599
Ni2316	Cts/S	5.0152	0.63558	12.673	5.6796	4.953	4.413
P_1774	Cts/S	0.07111	0.29364	412.96	-0.25998	0.29998	0.17332
P_2149	Cts/S	-0.02222	1.3206	5943.1	1.4888	-0.59996	-0.95549
Pb2169	Cts/S	1.726	0.4494	26.04	2.244	1.484	1.449
Pb2203	Cts/S	2.718	1.2083	44.454	2.118	4.1088	1.9271
Sb2068	Cts/S	2.1287	0.40077	18.827	2.5665	2.0399	1.7799
Sb2175	Cts/S	0.44219	1.247	282.01	-0.90661	0.67995	1.5532
Se1960	Cts/S	0.65551	0.14625	22.311	0.73995	0.48663	0.73995
Se2039	Cts/S	0.21554	0.95737	444.17	1.2199	-0.68662	0.11333
Si2516	Cts/S	3.6167	0.95438	26.388	4.7	3.25	2.9

Si2881	Cts/S	16.25	4.6605	28.68	14.85	12.45	21.45
Sn1899	Cts/S	-0.48886	0.09051	18.514	-0.43997	-0.4333	-0.59329
Sr3464	Cts/S	-1.65	8.9215	540.69	8.15	-9.3	-3.8
Sr4077	Cts/S	20.85	5.134	24.623	20.5	15.9	26.15
Te2142	Cts/S	-5.6396	0.49649	8.8036	-5.7863	-6.0463	-5.0863
Ti3349	Cts/S	9.0333	5.6003	61.996	14.6	3.4	9.1
Ti3361	Cts/S	150.02	6.2949	4.1961	153.8	142.75	153.5
Tl1908	Cts/S	-0.01333	0.66382	4979	0.27998	-0.77328	0.4533
U_3670	Cts/S	32.367	1.0599	3.2746	32.2	31.4	33.5
U_3859	Cts/S	-34.533	6.4508	18.68	-41.4	-33.6	-28.6
V_29240	Cts/S	4.05	2.8909	71.381	1.35	3.7	7.1
Zn2062	Cts/S	-0.07333	0.1775	242.06	-0.09333	0.11333	-0.23998
Zn2138	Cts/S	10.397	0.03671	0.35312	10.379	10.439	10.373
Zn3345	Cts/S	8.7333	3.1723	36.324	12.1	5.8	8.3

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CalibStd-1
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 10:45:09
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	Cts/S	93750	136.57	0.14568	93645	93699	93904

Ca3181	Cts/S	9013.4	25.726	0.28541	8985.6	9036.3	9018.5
Mg2790	Cts/S	10226	31.605	0.30906	10215	10202	10262
Mg2852	Cts/S	233160	714.88	0.3066	232470	233120	233900
K_7664	Cts/S	33294	159.76	0.47985	33203	33201	33478
K_7698	Cts/S	16961	99.702	0.58782	16919	16889	17075
Na5895	Cts/S	144600	675.2	0.4671	144200	144100	145300
Na8183	Cts/S	6217.1	25.377	0.40818	6190.9	6218.8	6241.6
Fe2599	Cts/S	8599.7	16.039	0.18651	8584.5	8598.2	8616.5
Fe2714	Cts/S	554.97	3.7254	0.67127	555.26	551.11	558.54
Li6707	Cts/S	48177	211.22	0.43842	48034	48077	48419
P_1774	Cts/S	585.95	2.2904	0.39088	583.31	587.03	587.49
P_2149	Cts/S	521.28	0.79572	0.15265	521.72	520.37	521.77

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CalibStd-2
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 10:48:58
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ag3280	Cts/S	540.36	4.5995	0.8512	535.14	542.15	543.8
Al1670	Cts/S	1113.6	4.0695	0.36543	1109.1	1114.9	1116.9
Al3961	Cts/S	8765.9	62.401	0.71187	8775	8699.4	8823.2

Au2427	Cts/S	2815.1	10.513	0.37344	2804.6	2815.3	2825.6
Au2675	Cts/S	2573.6	16.434	0.63856	2556.3	2575.7	2589
Ba4554	Cts/S	656250	4953.3	0.75478	653630	653150	661960
Ba2347	Cts/S	461.33	3.2863	0.71236	458.43	460.65	464.9
Cr2055	Cts/S	6860.2	15.06	0.21952	6852.7	6850.4	6877.5
Cr2666	Cts/S	1872.8	2.4081	0.12858	1872.6	1870.6	1875.4
Cr2677	Cts/S	8539	16.527	0.19355	8525	8534.9	8557.2
Cu2199	Cts/S	1149.9	1.9128	0.16634	1148.5	1149.2	1152.1
Cu3247	Cts/S	12546	63.499	0.50612	12519	12501	12619
Cu3273	Cts/S	8738.3	58.192	0.66594	8722.7	8689.5	8802.7
Hg1849	Cts/S	80.375	0.20051	0.24946	80.512	80.145	80.469
Hg1942	Cts/S	51.401	0.76273	1.4839	50.913	51.009	52.28
Ni2216	Cts/S	7124.5	20.886	0.29315	7116.5	7108.8	7148.2
Ni2303	Cts/S	2480.2	10.051	0.40524	2471.8	2477.4	2491.3
Ni2316	Cts/S	3788.8	9.5174	0.2512	3780.3	3787	3799
Te2142	Cts/S	611.26	2.1923	0.35866	612.91	608.77	612.11
Tl1908	Cts/S	536.46	1.4321	0.26695	534.94	536.65	537.78

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CalibStd-3
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 10:52:50
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
As1890	Cts/S	494.51	1.8627	0.37668	496.15	492.48	494.9
As1937	Cts/S	484.8	0.42034	0.0867	485.28	484.57	484.54
B_2089	Cts/S	3019.2	2.5067	0.08302	3016.7	3021.7	3019.2
B_2497	Cts/S	10946	67.481	0.61647	10869	10990	10981
Be3130	Cts/S	i 285340.	1772.2	0.62106	i 285010.	i 283760.	i 287260.
Be3131	Cts/S	i 144080.	758.69	0.52656	i 144050.	i 143340.	i 144860.
Cd2144	Cts/S	15734	16.751	0.10646	15744	15715	15744
Cd2288	Cts/S	10126	4.2872	0.04234	10124	10123	10131
Co2286	Cts/S	6012.2	3.4064	0.05666	6014.6	6008.3	6013.8
Co2388	Cts/S	6835.9	40.188	0.5879	6794.2	6839	6874.4
Mn2576	Cts/S	56833	342.51	0.60266	56455	56920	57124
Mn2593	Cts/S	55007	287.92	0.52342	54680	55122	55220
Mn4033	Cts/S	1952	16.932	0.86741	1932.8	1964.7	1958.4
Mo2020	Cts/S	3272.1	4.035	0.12332	3271	3268.7	3276.6
Mo2816	Cts/S	4582.5	24.566	0.53608	4559.6	4579.4	4608.5
Pb2169	Cts/S	147.7	0.6586	0.4459	148.5	147.3	147.3
Pb2203	Cts/S	1043.9	3.77	0.36116	1041	1042.5	1048.1
Sb2068	Cts/S	554.47	1.0755	0.19396	555.71	553.9	553.8
Sb2175	Cts/S	577.14	2.9118	0.50453	577.21	580.01	574.19
Se1960	Cts/S	348.57	0.35629	0.10221	348.24	348.52	348.95
Se2039	Cts/S	199.28	0.70277	0.35266	200.06	198.7	199.07
Si2516	Cts/S	5847.4	37.728	0.64521	5804.7	5876.3	5861.1
Si2881	Cts/S	4543.2	43.704	0.96197	4498.3	4545.6	4585.6
Sn1899	Cts/S	882.65	1.1135	0.12616	883.15	881.38	883.43
Sr3464	Cts/S	11355	25.942	0.22846	11330	11354	11381
Sr4077	Cts/S	1083900	12028	1.1098	1071500	1084500	1095600
Ti3349	Cts/S	60451	421.5	0.69726	59969	60635	60749
Ti3361	Cts/S	52362	314.88	0.60134	52009	52462	52615
V_29240	Cts/S	14428	64.815	0.44923	14356	14446	14482
Zn2062	Cts/S	7348.8	5.044	0.06864	7353.4	7343.4	7349.7
Zn2138	Cts/S	12013	7.1736	0.05972	12018	12005	12016
Zn3345	Cts/S	722.34	4.8875	0.67662	724.65	725.64	716.72

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CalibStd-4
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 10:56:41
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
U_3670	Cts/S	1115.7	15.019	1.3462	1101.1	1114.8	1131.1
U_3859	Cts/S	1996.3	15.52	0.77744	1981.7	1994.6	2012.6

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCV
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 11:00:34
Sample Type=QC

Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	26.129	0.08981	0.3437	26.026	26.169	26.192	Chk Pass		
Ca3181	mg/L	26.178	0.10607	0.40519	26.074	26.286	26.174	Chk Pass		
Mg2790	mg/L	25.881	0.08349	0.32259	25.785	25.937	25.92	Chk Pass		
Mg2852	mg/L	26.248	0.14409	0.54896	26.124	26.406	26.214	Chk Pass		
K_7664	mg/L	26.218	0.17073	0.65118	26.104	26.414	26.135	Chk Pass		
K_7698	mg/L	26.259	0.28167	1.0727	26.062	26.581	26.133	Chk Pass		
Na5895	mg/L	26.26	0.2379	0.9061	26.1	26.53	26.14	Chk Pass		
Na8183	mg/L	26.325	0.06476	0.246	26.265	26.315	26.394	Chk Pass		
Ag3280	mg/L	1.0238	0.00719	0.70266	1.017	1.023	1.0314	Chk Pass		
Al1670	mg/L	2.539	0.00719	0.28332	2.5312	2.5453	2.5406	Chk Pass		
Al3961	mg/L	2.5921	0.02204	0.85027	2.5737	2.6165	2.5861	Chk Pass		
As1890	mg/L	2.5434	0.01174	0.46141	2.535	2.5385	2.5568	Chk Pass		
As1937	mg/L	2.5483	0.00858	0.33665	2.5446	2.5422	2.5581	Chk Pass		
Au2427	mg/L	2.5062	0.03273	1.3058	2.4691	2.5181	2.5313	Chk Pass		
Au2675	mg/L	2.5306	0.02357	0.93134	2.508	2.5551	2.5288	Chk Pass		
B_2089	mg/L	2.5087	0.00421	0.16781	2.5119	2.504	2.5103	Chk Pass		
B_2497	mg/L	2.5136	0.01321	0.52535	2.499	2.5246	2.5173	Chk Pass		
Ba4554	mg/L	2.5597	0.02119	0.82791	2.5437	2.5516	2.5837	Chk Pass		
Ba2347	mg/L	2.5303	0.02963	1.171	2.4982	2.5566	2.5362	Chk Pass		
Be3130	mg/L	i 1.2666	0.00604	0.47691	i 1.2601	i 1.2720	i 1.2676	Chk Pass		
Be3131	mg/L	i 1.2664	0.00524	0.41356	i 1.2611	i 1.2716	i 1.2664	Chk Pass		
Cd2144	mg/L	2.4707	0.00151	0.06129	2.4689	2.4715	2.4717	Chk Pass		
Cd2288	mg/L	2.5014	0.00392	0.15657	2.5005	2.498	2.5057	Chk Pass		
Co2286	mg/L	2.4754	0.00376	0.15194	2.4755	2.4715	2.4791	Chk Pass		
Co2388	mg/L	2.4557	0.00788	0.321	2.4489	2.4539	2.4643	Chk Pass		
Cr2055	mg/L	2.5336	0.00443	0.17493	2.5386	2.5302	2.532	Chk Pass		
Cr2666	mg/L	2.5163	0.00994	0.39486	2.5101	2.5111	2.5278	Chk Pass		
Cr2677	mg/L	2.5124	0.01374	0.54679	2.4968	2.5179	2.5226	Chk Pass		
Cu2199	mg/L	2.3352	0.00822	0.35195	2.3392	2.3257	2.3406	Chk Pass		

Cu3247	mg/L	2.5233	0.02098	0.8316	2.5036	2.5453	2.5209	Chk Pass
Cu3273	mg/L	2.5025	0.0137	0.5473	2.4892	2.5165	2.5018	Chk Pass
Fe2599	mg/L	2.6235	0.01626	0.61996	2.6048	2.6345	2.6311	Chk Pass
Fe2714	mg/L	2.6154	0.02627	1.0043	2.5885	2.6169	2.6409	Chk Pass
Hg1849	mg/L	1.0236	0.00146	0.1427	1.0221	1.025	1.0236	Chk Pass
Hg1942	mg/L	1.0289	0.00472	0.45886	1.0325	1.0236	1.0307	Chk Pass
Li6707	mg/L	1.315	0.01486	1.1297	1.3064	1.3322	1.3064	Chk Pass
Mn2576	mg/L	2.483	0.00876	0.35265	2.473	2.4892	2.4868	Chk Pass
Mn2593	mg/L	2.4789	0.01106	0.44629	2.4684	2.4904	2.4781	Chk Pass
Mn4033	mg/L	2.4852	0.04809	1.9352	2.4487	2.5397	2.4672	Chk Pass
Mo2020	mg/L	2.5147	0.00387	0.15405	2.519	2.5135	2.5115	Chk Pass
Mo2816	mg/L	2.4768	0.00785	0.31704	2.4697	2.4852	2.4754	Chk Pass
Ni2216	mg/L	2.4807	0.00299	0.12051	2.4832	2.4774	2.4816	Chk Pass
Ni2303	mg/L	2.4771	0.00303	0.12229	2.4737	2.4778	2.4797	Chk Pass
Ni2316	mg/L	2.4742	0.00343	0.13857	2.4769	2.4704	2.4753	Chk Pass
P_1774	mg/L	2.5755	0.00602	0.23364	2.5819	2.5699	2.5747	Chk Pass
P_2149	mg/L	2.5563	0.01313	0.51367	2.5605	2.5416	2.5668	Chk Pass
Pb2169	mg/L	2.468	0.01	0.4045	2.456	2.474	2.474	Chk Pass
Pb2203	mg/L	2.4685	0.01113	0.45106	2.4719	2.4776	2.4561	Chk Pass
Sb2068	mg/L	2.5345	0.01125	0.44374	2.5467	2.5322	2.5245	Chk Pass
Sb2175	mg/L	2.5293	0.006	0.23728	2.5361	2.5274	2.5246	Chk Pass
Se1960	mg/L	2.5173	0.01814	0.72075	2.5175	2.4991	2.5354	Chk Pass
Se2039	mg/L	2.51	0.01041	0.41489	2.5146	2.5173	2.4981	Chk Pass
Si2516	mg/L	5.1137	0.02463	0.48166	5.0854	5.1302	5.1254	Chk Pass
Si2881	mg/L	5.1067	0.03295	0.64522	5.0695	5.1322	5.1184	Chk Pass
Sn1899	mg/L	2.4797	0.00584	0.23557	2.4817	2.4731	2.4843	Chk Pass
Sr3464	mg/L	2.4795	0.01681	0.67779	2.4601	2.4877	2.4906	Chk Pass
Sr4077	mg/L	2.5031	0.01953	0.78021	2.4834	2.5035	2.5224	Chk Pass
Te2142	mg/L	2.531	0.0051	0.20136	2.5274	2.5369	2.5289	Chk Pass
Ti3349	mg/L	2.4995	0.01137	0.45496	2.4882	2.511	2.4992	Chk Pass
Ti3361	mg/L	2.512	0.01468	0.58444	2.4953	2.5231	2.5175	Chk Pass
Tl1908	mg/L	2.491	0.0218	0.87503	2.4758	2.4812	2.5159	Chk Pass
U_3670	mg/L	2.5182	0.05842	2.3198	2.453	2.5357	2.5658	Chk Pass
U_3859	mg/L	2.5626	0.05361	2.092	2.5073	2.6143	2.5664	Chk Pass
V_29240	mg/L	2.5315	0.01356	0.53579	2.5159	2.5389	2.5398	Chk Pass

Zn2062	mg/L	2.4767	0.00365	0.14737	2.4725	2.4793	2.4783	Chk Pass
Zn2138	mg/L	2.5016	0.00409	0.16342	2.501	2.4978	2.5059	Chk Pass
Zn3345	mg/L	2.4908	0.05331	2.14	2.5062	2.5348	2.4315	Chk Pass

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCB
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 11:04:17
Sample Type=QC
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	0.00254	0.00107	42.266	0.0028	0.00136	0.00345	Chk Pass		
Ca3181	mg/L	0.01183	0.0134	113.24	0.01618	-0.0032	0.02251	Chk Pass		
Mg2790	mg/L	-0.00088	0.00497	565.37	-0.00338	-0.0041	0.00484	Chk Pass		
Mg2852	mg/L	0.0035	0.00024	6.7722	0.00326	0.00373	0.0035	Chk Pass		
K_7664	mg/L	0.0004	0.018	4487.4	0.00921	-0.0203	0.0123	Chk Pass		
K_7698	mg/L	0.04104	0.01204	29.329	0.05463	0.03172	0.03678	Chk Pass		
Na5895	mg/L	0.0657	0.003	4.493	0.0632	0.065	0.069	Chk Pass		
Na8183	mg/L	0.02853	0.11925	418	0.04868	-0.09952	0.13642	Chk Pass		
Ag3280	mg/L	0.00119	0.00126	105.83	0.0024	0.00129	-0.00011	None		
Al1670	mg/L	-0.0008	0.00095	118.86	0.00018	-0.00087	-0.00171	None		
Al3961	mg/L	0.00547	0.00282	51.593	0.00509	0.00847	0.00286	Chk Pass		
As1890	mg/L	0.00494	0.00046	9.4055	0.00448	0.00493	0.00541	None		

As1937	mg/L	-0.00063	0.00199	316.72	0.00088	-0.00288	0.00012	None
Au2427	mg/L	0.00733	0.00456	62.242	0.00218	0.01087	0.00893	None
Au2675	mg/L	0.01168	0.00412	35.307	0.00726	0.01542	0.01235	None
B_2089	mg/L	-0.00019	0.00104	553.41	0.00101	-0.00077	-0.00081	Chk Pass
B_2497	mg/L	0.00215	0.00119	55.547	0.00201	0.00341	0.00103	Chk Pass
Ba4554	mg/L	0.00037	0.00008	20.491	0.00046	0.00035	0.00031	None
Ba2347	mg/L	-0.00881	0.00469	53.229	-0.01058	-0.00349	-0.01236	None
Be3130	mg/L	i .00020	0.00004	17.874	i .00023	i .00020	i .00016	None
Be3131	mg/L	i -.00013	0.00005	38.746	i -.00008	i -.00013	i -.00019	None
Cd2144	mg/L	0.00007	0.00027	394.21	0.00032	-0.00022	0.0001	None
Cd2288	mg/L	0.00038	0.00019	50.046	0.00037	0.00057	0.00019	None
Co2286	mg/L	0.00073	0.00055	75.348	0.00084	0.00013	0.00121	None
Co2388	mg/L	0.00116	0.00109	94.287	0.00024	0.00237	0.00087	None
Cr2055	mg/L	0.00054	0.00026	48.115	0.00083	0.00032	0.00047	None
Cr2666	mg/L	-0.00464	0.00209	44.988	-0.00234	-0.00516	-0.00642	None
Cr2677	mg/L	0.00167	0.00076	45.417	0.00244	0.00092	0.00165	None
Cu2199	mg/L	0.00217	0.00243	112.02	0.0046	-0.00026	0.00217	None
Cu3247	mg/L	-0.00014	0.00018	127.5	0.00007	-0.00025	-0.00023	None
Cu3273	mg/L	-0.00118	0.00108	91.532	-0.00059	-0.00242	-0.00052	None
Fe2599	mg/L	-0.00014	0.00075	551.28	0.00006	0.0005	-0.00096	Chk Pass
Fe2714	mg/L	-0.03079	0.01459	47.401	-0.0142	-0.04165	-0.03652	Chk Pass
Hg1849	mg/L	-0.00042	0.00118	280.05	-0.0016	0.00075	-0.00041	None
Hg1942	mg/L	0.0007	0.00151	215.35	0.00212	-0.00088	0.00087	None
Li6707	mg/L	-0.00007	0.00036	507.23	0.00021	-0.00047	0.00005	None
Mn2576	mg/L	0.00013	0.00028	222.99	-0.00009	0.00002	0.00044	None
Mn2593	mg/L	0.00024	0.00037	153.24	-0.00002	0.00066	0.00007	None
Mn4033	mg/L	-0.0067	0.02778	414.45	-0.0274	0.02487	-0.01758	None
Mo2020	mg/L	0.00087	0.00067	76.953	0.00164	0.00044	0.00053	None
Mo2816	mg/L	0.00382	0.00064	16.856	0.0045	0.00322	0.00375	None
Ni2216	mg/L	-0.00042	0.00072	171.65	-0.00109	0.00035	-0.00053	None
Ni2303	mg/L	0.00263	0.00073	27.602	0.00315	0.00294	0.0018	None
Ni2316	mg/L	0.00013	0.0004	301.77	0.00006	-0.00023	0.00057	None
P_1774	mg/L	-0.0011	0.00423	385.51	-0.00201	-0.00479	0.00351	None
P_2149	mg/L	-0.00021	0.00484	2318.4	0.00429	-0.00534	0.00042	None
Pb2169	mg/L	-0.0153	0.0272	178	-0.0411	0.0131	-0.0178	None

Pb2203	mg/L	-0.00094	0.01113	1185.6	-0.00868	-0.00596	0.01182	None
Sb2068	mg/L	0.00222	0.00427	192.05	-0.00263	0.00541	0.00389	None
Sb2175	mg/L	-0.00876	0.00954	108.93	-0.01844	-0.00845	0.00063	None
Se1960	mg/L	0.01281	0.00592	46.248	0.01569	0.00599	0.01674	None
Se2039	mg/L	0.01336	0.00724	54.211	0.01506	0.0196	0.00542	None
Si2516	mg/L	-0.00194	0.00628	324.25	0.00439	-0.00204	-0.00816	None
Si2881	mg/L	0.00095	0.01579	1663.5	-0.00564	-0.01048	0.01897	None
Sn1899	mg/L	0.00058	0.00145	249.81	0.00088	-0.001	0.00186	None
Sr3464	mg/L	0.00172	0.00128	74.699	0.00085	0.00111	0.00319	None
Sr4077	mg/L	0.00028	0.00003	10.385	0.00031	0.00026	0.00026	None
Te2142	mg/L	0.01468	0.01035	70.493	0.02625	0.00633	0.01144	None
Ti3349	mg/L	0.00074	0.00045	60.196	0.00109	0.0009	0.00024	None
Ti3361	mg/L	0.00077	0.00012	15.989	0.00063	0.00082	0.00086	None
Tl1908	mg/L	0.00287	0.00441	153.7	0.0037	0.0068	-0.0019	None
U_3670	mg/L	-0.01987	0.04363	219.6	-0.06717	0.0188	-0.01123	None
U_3859	mg/L	0.03618	0.00199	5.503	0.03404	0.03798	0.03651	None
V_29240	mg/L	0.00035	0.00085	240.68	0.00029	-0.00046	0.00123	None
Zn2062	mg/L	0.00034	0.00046	135.74	-0.00019	0.00059	0.00061	None
Zn2138	mg/L	0.0001	0.00017	172	0.00021	-0.00009	0.00018	Chk Pass
Zn3345	mg/L	-0.02286	0.03971	173.75	-0.05974	0.01919	-0.02802	None

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=MB-7400DIS180206A
Username=Ron Hunt
Comment=ICP-200.7-W-D
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 11:08:10
Sample Type=Unk
Mode=CONC

CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	0.00348	0.00125	36.004	0.00492	0.00291	0.00261
Ca3181	mg/L	-0.01992	0.01235	62.015	-0.03283	-0.00822	-0.01871
Mg2790	mg/L	0.00206	0.00545	265.13	-0.00182	-0.0003	0.00829
Mg2852	mg/L	0.00034	0.00027	80.086	0.00022	0.00014	0.00064
K_7664	mg/L	-0.00002	0.01642	73706	0.0048	0.01345	-0.01831
K_7698	mg/L	0.04941	0.01181	23.899	0.04885	0.0615	0.0379
Na5895	mg/L	0.0675	0.0011	1.626	0.0666	0.0687	0.0672
Na8183	mg/L	-0.01577	0.08298	526.22	-0.09614	0.06959	-0.02076
Ag3280	mg/L	0.00021	0.00205	965.74	-0.00174	0.00003	0.00235
Al1670	mg/L	-0.00202	0.0013	64.459	-0.00052	-0.00284	-0.0027
Al3961	mg/L	-0.00164	0.00473	289	-0.00694	-0.00012	0.00215
As1890	mg/L	0.00229	0.00164	71.79	0.00298	0.00348	0.00041
As1937	mg/L	-0.00261	0.00332	127.36	0.00079	-0.00586	-0.00276
Au2427	mg/L	0.00315	0.00209	66.329	0.00368	0.00085	0.00493
Au2675	mg/L	0.01014	0.00123	12.156	0.00877	0.01117	0.01048
B_2089	mg/L	0.00049	0.00046	93.375	0.00021	0.00024	0.00103
B_2497	mg/L	-0.00066	0.00048	73.23	-0.00018	-0.00065	-0.00115
Ba4554	mg/L	0.00017	0.00005	31.024	0.00014	0.00023	0.00014
Ba2347	mg/L	0.0079	0.01264	159.89	-0.00332	0.02159	0.00544
Be3130	mg/L	i .00007	0.00003	35.798	i .00006	i .00005	i .00010
Be3131	mg/L	i -.00028	0.00006	21.977	i -.00025	i -.00035	i -.00024
Cd2144	mg/L	-0.00008	0.00025	315.02	-0.00009	0.00017	-0.00032
Cd2288	mg/L	-0.00004	0.00029	760.97	-0.00031	-0.00006	0.00026
Co2286	mg/L	-0.00005	0.00078	1441	0.00069	-0.00087	0.00002
Co2388	mg/L	0.00084	0.00038	45.927	0.00055	0.00068	0.00127
Cr2055	mg/L	0.00066	0.0004	60.432	0.00111	0.00037	0.00049
Cr2666	mg/L	-0.01001	0.00316	31.573	-0.01364	-0.00793	-0.00844
Cr2677	mg/L	0.00125	0.00149	119.45	0.00093	0.00287	-0.00006
Cu2199	mg/L	0.00047	0.00169	358.65	0.00003	-0.00095	0.00234
Cu3247	mg/L	-0.00052	0.00131	253.64	-0.00104	0.00097	-0.00148

Cu3273	mg/L	0.00012	0.00368	3089.2	-0.00293	0.00421	-0.00092
Fe2599	mg/L	-0.00052	0.00058	111.39	-0.00093	-0.00079	0.00014
Fe2714	mg/L	0.00654	0.0218	333.38	0.03131	-0.0097	-0.002
Hg1849	mg/L	-0.00081	0.00117	144.37	0.00054	-0.00156	-0.00141
Hg1942	mg/L	-0.00091	0.00064	70.379	-0.00165	-0.00045	-0.00064
Li6707	mg/L	-0.00011	0.00021	194.26	0.00007	-0.00005	-0.00034
Mn2576	mg/L	-0.00017	0.00019	108.34	-0.00023	-0.00032	0.00004
Mn2593	mg/L	-0.00001	0.00009	694.84	-0.00001	-0.00011	0.00008
Mn4033	mg/L	-0.00929	0.02357	253.64	-0.03574	-0.00165	0.00951
Mo2020	mg/L	0.00077	0.00092	119.28	0.00085	0.00165	-0.00018
Mo2816	mg/L	-0.00067	0.00626	934.23	0.00653	-0.0049	-0.00364
Ni2216	mg/L	-0.00027	0.00022	79.586	-0.00005	-0.00029	-0.00049
Ni2303	mg/L	0.0021	0.00183	87.078	0.00035	0.00399	0.00195
Ni2316	mg/L	0.00008	0.00067	871.94	0.00025	-0.00067	0.00065
P_1774	mg/L	-0.003	0.00473	157.52	-0.00759	0.00185	-0.00327
P_2149	mg/L	0.00046	0.00823	1797.2	-0.00023	0.00901	-0.00741
Pb2169	mg/L	-0.0173	0.0063	36.29	-0.0105	-0.0185	-0.0228
Pb2203	mg/L	-0.00562	0.00484	86.242	-0.00515	-0.00102	-0.01068
Sb2068	mg/L	-0.0001	0.00486	4907.6	0.00094	0.00416	-0.0054
Sb2175	mg/L	-0.00207	0.00564	272.45	0.00039	-0.00852	0.00192
Se1960	mg/L	0.00174	0.00347	199.72	0.00535	0.00141	-0.00156
Se2039	mg/L	0.02113	0.01137	53.794	0.02429	0.00852	0.03059
Si2516	mg/L	0.00568	0.00351	61.7	0.0097	0.00416	0.0032
Si2881	mg/L	0.02472	0.00453	18.331	0.0299	0.02275	0.02151
Sn1899	mg/L	0.00143	0.00133	92.874	0.00289	0.00027	0.00114
Sr3464	mg/L	0.00089	0.00193	217.54	0.00183	-0.00133	0.00217
Sr4077	mg/L	0.00002	0.00003	111.17	0.00005	0.00003	0
Te2142	mg/L	0.0115	0.00672	58.443	0.00375	0.0157	0.01506
Ti3349	mg/L	0.00067	0.00017	26.031	0.00087	0.00057	0.00056
Ti3361	mg/L	0.00038	0.00043	112.72	-0.00009	0.00048	0.00075
Tl1908	mg/L	0.00174	0.00834	478.01	0.00233	0.00977	-0.00687
U_3670	mg/L	-0.06927	0.00933	13.473	-0.05861	-0.07596	-0.07323
U_3859	mg/L	0.0447	0.01475	32.993	0.03497	0.03746	0.06167
V_29240	mg/L	0.00004	0.00065	1812	-0.00029	0.00079	-0.00039
Zn2062	mg/L	0.00011	0.00015	131.83	0.00011	0.00026	-0.00003

Zn2138	mg/L	-0.00001	0.00027	1815.1	-0.00024	-0.00009	0.00028
Zn3345	mg/L	-0.03326	0.05629	169.23	-0.09742	-0.01024	0.00787

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=LLRV
Username=Ron Hunt
Comment=ICP-200.7-W-D
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 11:12:03
Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	0.32409	0.00107	0.33026	0.32308	0.32398	0.32521
Ca3181	mg/L	0.32337	0.01009	3.1213	0.31206	0.32658	0.33146
Mg2790	mg/L	0.08915	0.01854	20.795	0.07548	0.11025	0.08171
Mg2852	mg/L	0.08589	0.00018	0.21419	0.08573	0.08609	0.08583
K_7664	mg/L	0.53687	0.02512	4.6791	0.54409	0.55759	0.50893
K_7698	mg/L	0.68149	0.02605	3.8227	0.65147	0.69806	0.69495
Na5895	mg/L	0.3968	0.0015	0.3861	0.3956	0.3985	0.3963
Na8183	mg/L	0.42746	0.10103	23.635	0.41961	0.53218	0.33058
Ag3280	mg/L	0.05204	0.00119	2.2946	0.05066	0.05285	0.0526
Al1670	mg/L	0.10542	0.00205	1.9415	0.10365	0.10495	0.10766
Al3961	mg/L	0.10401	0.00302	2.8991	0.10278	0.1018	0.10744
As1890	mg/L	0.20847	0.00398	1.9092	0.21167	0.20971	0.20401
As1937	mg/L	0.20515	0.00198	0.96453	0.2039	0.20743	0.20411

Au2427	mg/L	0.19856	0.00252	1.2711	0.19909	0.19581	0.20078
Au2675	mg/L	0.20631	0.00476	2.3079	0.20103	0.20761	0.21028
B_2089	mg/L	0.04987	0.00024	0.47199	0.05012	0.04965	0.04984
B_2497	mg/L	0.05026	0.00057	1.1349	0.05054	0.0496	0.05063
Ba4554	mg/L	0.00304	0.00007	2.4209	0.00313	0.003	0.00301
Ba2347	mg/L	0.00984	0.01373	139.5	0.01914	-0.00593	0.01632
Be3130	mg/L	i .00208	0.00006	2.942	i .00214	i .00207	i .00202
Be3131	mg/L	i .00179	0.00004	2.1722	i .00177	i .00177	i .00184
Cd2144	mg/L	0.00496	0.00008	1.6614	0.00495	0.00488	0.00504
Cd2288	mg/L	0.00487	0.00024	4.8911	0.0049	0.00462	0.00509
Co2286	mg/L	0.03091	0.00045	1.4644	0.03141	0.03054	0.03077
Co2388	mg/L	0.03054	0.00084	2.748	0.02987	0.03027	0.03148
Cr2055	mg/L	0.0412	0.00032	0.77792	0.04105	0.04098	0.04157
Cr2666	mg/L	0.03784	0.0103	27.228	0.04891	0.02854	0.03605
Cr2677	mg/L	0.04301	0.00129	3.0001	0.04266	0.04194	0.04444
Cu2199	mg/L	0.04816	0.00468	9.7082	0.04286	0.04992	0.05171
Cu3247	mg/L	0.05229	0.0005	0.96111	0.05236	0.05175	0.05275
Cu3273	mg/L	0.04737	0.00164	3.4671	0.04691	0.0492	0.04602
Fe2599	mg/L	0.03079	0.00067	2.1868	0.03097	0.03004	0.03135
Fe2714	mg/L	0.03441	0.02573	74.773	0.04889	0.0047	0.04963
Hg1849	mg/L	0.10498	0.00092	0.87862	0.10395	0.10574	0.10525
Hg1942	mg/L	0.10359	0.00154	1.488	0.10535	0.10292	0.10249
Li6707	mg/L	0.05543	0.00068	1.2196	0.05528	0.05617	0.05484
Mn2576	mg/L	0.00482	0.00027	5.5199	0.00473	0.00462	0.00512
Mn2593	mg/L	0.00487	0.00038	7.7564	0.0051	0.00444	0.00509
Mn4033	mg/L	0.00588	0.02146	365.04	-0.00384	0.03048	-0.009
Mo2020	mg/L	0.0393	0.00159	4.0336	0.04092	0.03776	0.03922
Mo2816	mg/L	0.04105	0.00284	6.9081	0.0417	0.0435	0.03795
Ni2216	mg/L	0.0302	0.00045	1.485	0.02988	0.03071	0.03001
Ni2303	mg/L	0.03332	0.00029	0.88099	0.03363	0.03327	0.03305
Ni2316	mg/L	0.03004	0.00015	0.49071	0.02987	0.03008	0.03016
P_1774	mg/L	0.39751	0.00166	0.41727	0.39856	0.3956	0.39838
P_2149	mg/L	0.4029	0.02244	5.5694	0.42833	0.3859	0.39446
Pb2169	mg/L	0.1936	0.0205	10.57	0.2164	0.1875	0.1769
Pb2203	mg/L	0.19804	0.00322	1.6273	0.19501	0.20143	0.19768

Sb2068	mg/L	0.19639	0.0008	0.40685	0.19585	0.19731	0.19602
Sb2175	mg/L	0.19828	0.00789	3.9804	0.19536	0.19227	0.20722
Se1960	mg/L	0.3081	0.00213	0.69025	0.30583	0.30841	0.31005
Se2039	mg/L	0.32608	0.00932	2.8579	0.33419	0.3159	0.32817
Si2516	mg/L	0.31018	0.00534	1.7226	0.3151	0.3045	0.31094
Si2881	mg/L	0.30871	0.00521	1.6874	0.30317	0.30945	0.31351
Sn1899	mg/L	0.10445	0.00144	1.3814	0.1028	0.10508	0.10547
Sr3464	mg/L	0.00475	0.00233	49.016	0.00715	0.00251	0.00457
Sr4077	mg/L	0.00207	0.00004	2.1039	0.00204	0.00212	0.00205
Te2142	mg/L	0.22137	0.0024	1.0843	0.22132	0.219	0.2238
Ti3349	mg/L	0.02047	0.00041	2.0144	0.02034	0.02094	0.02015
Ti3361	mg/L	0.02067	0.00017	0.8204	0.02073	0.02049	0.02081
Tl1908	mg/L	0.20121	0.00409	2.0331	0.19757	0.20043	0.20564
U_3670	mg/L	0.98336	0.01849	1.8805	0.97899	1.0036	0.96744
U_3859	mg/L	1.0504	0.0228	2.1706	1.0325	1.0426	1.0761
V_29240	mg/L	0.05019	0.00136	2.7037	0.05118	0.05073	0.04864
Zn2062	mg/L	0.0208	0.0004	1.905	0.02125	0.02066	0.02049
Zn2138	mg/L	0.02086	0.00018	0.8748	0.02097	0.02065	0.02098
Zn3345	mg/L	0.01374	0.04344	316.2	-0.02108	0.06242	-0.00012

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=LFB-7400DIS180206A
Username=Ron Hunt
Comment=ICP-200.7-W-D
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 11:15:56
Sample Type=Unk
Mode=CONC
CorrFactor=1.030

Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	51	0.17669	0.34645	50.806	51.045	51.151
Ca3181	mg/L	50.999	0.16377	0.32112	50.829	51.156	51.012
Mg2790	mg/L	50.787	0.24336	0.47918	50.511	50.88	50.971
Mg2852	mg/L	50.898	0.27535	0.541	50.689	50.795	51.21
K_7664	mg/L	51.383	0.28932	0.56307	51.129	51.323	51.698
K_7698	mg/L	51.238	0.32179	0.62804	50.972	51.147	51.596
Na5895	mg/L	51.08	0.3692	0.7228	50.72	51.07	51.46
Na8183	mg/L	51.433	0.52127	1.0135	51.072	51.196	52.031
Ag3280	mg/L	0.4822	0.00463	0.95921	0.47768	0.482	0.48692
Al1670	mg/L	4.8512	0.02061	0.42475	4.8347	4.8446	4.8743
Al3961	mg/L	5.086	0.02707	0.53222	5.0686	5.0723	5.1172
As1890	mg/L	1	0.00598	0.59821	0.99672	0.99644	1.0069
As1937	mg/L	1.0066	0.00662	0.65772	1.0124	0.9994	1.0079
Au2427	mg/L	0.94515	0.01314	1.3908	0.93063	0.95624	0.94858
Au2675	mg/L	0.9784	0.01508	1.541	0.96957	0.96982	0.99581
B_2089	mg/L	0.99566	0.00569	0.57153	0.99094	0.99407	1.002
B_2497	mg/L	1.0018	0.00582	0.58094	0.99533	1.0033	1.0067
Ba4554	mg/L	1.0012	0.0062	0.61913	0.9966	0.99868	1.0082
Ba2347	mg/L	1.0255	0.01558	1.5192	1.0098	1.041	1.0257
Be3130	mg/L	i .50042	0.00283	0.56617	i .49759	i .50040	i .50326
Be3131	mg/L	i .50023	0.00311	0.62081	i .49770	i .49929	i .50370
Cd2144	mg/L	0.48455	0.00101	0.20792	0.48481	0.48343	0.48539
Cd2288	mg/L	0.49304	0.00099	0.20041	0.49194	0.49331	0.49385
Co2286	mg/L	0.96445	0.00149	0.15402	0.96605	0.96417	0.96312
Co2388	mg/L	0.95911	0.00231	0.24065	0.95909	0.95681	0.96143
Cr2055	mg/L	0.98633	0.00095	0.09603	0.98677	0.98525	0.98699
Cr2666	mg/L	0.98923	0.00491	0.49679	0.98526	0.99472	0.98769
Cr2677	mg/L	0.9816	0.005	0.50917	0.97899	0.97846	0.98737
Cu2199	mg/L	0.91098	0.0088	0.96609	0.91033	0.92009	0.90253
Cu3247	mg/L	0.98382	0.00697	0.70887	0.98214	0.97784	0.99148
Cu3273	mg/L	0.97042	0.00879	0.90551	0.96307	0.96803	0.98015

Fe2599	mg/L	5.1147	0.03172	0.62015	5.0885	5.1058	5.15
Fe2714	mg/L	5.148	0.04477	0.86968	5.0969	5.1803	5.1667
Hg1849	mg/L	0.99744	0.00322	0.32246	0.99638	0.99489	1.0011
Hg1942	mg/L	0.99099	0.00281	0.28385	0.98925	0.98948	0.99423
Li6707	mg/L	1.0302	0.00657	0.6377	1.0241	1.0293	1.0372
Mn2576	mg/L	4.879	0.02093	0.42889	4.8575	4.8803	4.8993
Mn2593	mg/L	4.8901	0.02355	0.48157	4.8694	4.8852	4.9157
Mn4033	mg/L	4.95	0.04625	0.93439	4.897	4.9821	4.9709
Mo2020	mg/L	0.97052	0.00201	0.20746	0.97197	0.96822	0.97136
Mo2816	mg/L	0.92579	0.00925	0.99954	0.91898	0.92207	0.93633
Ni2216	mg/L	0.96452	0.00175	0.18154	0.96519	0.96583	0.96253
Ni2303	mg/L	0.95805	0.00033	0.03479	0.95791	0.9578	0.95843
Ni2316	mg/L	0.95713	0.00322	0.33643	0.9554	0.95514	0.96084
P_1774	mg/L	10.16	0.0151	0.14866	10.147	10.155	10.177
P_2149	mg/L	10.159	0.01772	0.1744	10.177	10.16	10.141
Pb2169	mg/L	0.9615	0.0329	3.424	0.9307	0.9576	0.9962
Pb2203	mg/L	0.96406	0.00472	0.48952	0.96907	0.95969	0.96344
Sb2068	mg/L	0.98969	0.00693	0.70044	0.99569	0.9821	0.99127
Sb2175	mg/L	0.97855	0.00533	0.54424	0.97385	0.97748	0.98434
Se1960	mg/L	0.98498	0.02082	2.1141	1.0088	0.97009	0.97609
Se2039	mg/L	0.99546	0.01204	1.21	1.0091	0.99098	0.9863
Si2516	mg/L	10.055	0.06313	0.62781	10.016	10.021	10.128
Si2881	mg/L	9.9742	0.07066	0.70847	9.9178	9.9512	10.053
Sn1899	mg/L	0.96045	0.00475	0.49424	0.95889	0.95668	0.96578
Sr3464	mg/L	0.96776	0.00547	0.56549	0.967	0.96271	0.97357
Sr4077	mg/L	0.99143	0.00682	0.68776	0.98642	0.98868	0.99919
Te2142	mg/L	1.0035	0.01435	1.4304	1.0165	0.98812	1.0059
Ti3349	mg/L	0.98554	0.0039	0.39583	0.98188	0.98509	0.98965
Ti3361	mg/L	0.98662	0.00828	0.83972	0.97979	0.98424	0.99584
Tl1908	mg/L	0.96257	0.01533	1.5926	0.97019	0.9726	0.94492
U_3670	mg/L	0.94445	0.00665	0.7045	0.94452	0.93776	0.95107
U_3859	mg/L	1.0368	0.02426	2.3404	1.0403	1.0109	1.0591
V_29240	mg/L	0.99991	0.00651	0.65138	0.99415	0.99859	1.007
Zn2062	mg/L	0.95684	0.00154	0.16108	0.95835	0.95527	0.95691
Zn2138	mg/L	0.98472	0.00235	0.23901	0.98523	0.98215	0.98677

Zn3345	mg/L	0.9147	0.03267	3.5712	0.88314	0.94837	0.91258

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=QCS
Username=Ron Hunt
Comment=ICP-200.7-W-D
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 11:19:19
Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	40.433	0.10184	0.25186	40.326	40.442	40.529
Ca3181	mg/L	40.622	0.06456	0.15894	40.586	40.583	40.696
Mg2790	mg/L	40.079	0.15235	0.38011	39.904	40.172	40.162
Mg2852	mg/L	40.88	0.13419	0.32826	40.77	41.029	40.84
K_7664	mg/L	41.519	0.15504	0.37341	41.431	41.698	41.428
K_7698	mg/L	41.461	0.20053	0.48366	41.412	41.682	41.29
Na5895	mg/L	41.36	0.2324	0.5619	41.26	41.63	41.2
Na8183	mg/L	41.318	0.28387	0.68703	41.169	41.646	41.141
Ag3280	mg/L	0.39386	0.00184	0.46667	0.39483	0.39502	0.39174
Al1670	mg/L	3.9158	0.01573	0.40179	3.9044	3.9091	3.9337
Al3961	mg/L	4.0928	0.01831	0.4473	4.0774	4.1131	4.0879
As1890	mg/L	0.79785	0.00285	0.35734	0.80108	0.79679	0.79568
As1937	mg/L	0.80343	0.00694	0.86322	0.80294	0.79676	0.8106
Au2427	mg/L	1.9366	0.01567	0.80901	1.9201	1.9383	1.9513

Au2675	mg/L	1.9856	0.02095	1.0553	1.9633	1.9885	2.0049
B_2089	mg/L	0.79648	0.00241	0.30207	0.79826	0.79374	0.79743
B_2497	mg/L	0.81028	0.00625	0.771	0.80373	0.81617	0.81093
Ba4554	mg/L	0.80181	0.0046	0.57376	0.79864	0.80709	0.7997
Ba2347	mg/L	0.79643	0.0216	2.7127	0.77297	0.80081	0.81551
Be3130	mg/L	i .40097	0.0008	0.20026	i .40028	i .40185	i .40079
Be3131	mg/L	i .39952	0.00129	0.32319	i .39891	i .40100	i .39864
Cd2144	mg/L	0.38802	0.00072	0.1865	0.38769	0.38751	0.38884
Cd2288	mg/L	0.3932	0.00047	0.12036	0.39284	0.39302	0.39374
Co2286	mg/L	0.77001	0.00061	0.0798	0.77046	0.76931	0.77026
Co2388	mg/L	0.76759	0.00101	0.13116	0.76695	0.76875	0.76706
Cr2055	mg/L	0.7894	0.00209	0.26426	0.78703	0.79025	0.79093
Cr2666	mg/L	0.78844	0.01118	1.4183	0.77588	0.79211	0.79732
Cr2677	mg/L	0.786	0.00291	0.37064	0.78295	0.7863	0.78875
Cu2199	mg/L	0.72601	0.00292	0.40259	0.72287	0.72865	0.72651
Cu3247	mg/L	0.7942	0.00345	0.43411	0.79024	0.79653	0.79584
Cu3273	mg/L	0.77299	0.00695	0.89961	0.76924	0.78101	0.76872
Fe2599	mg/L	4.1182	0.01807	0.43874	4.0986	4.1342	4.1217
Fe2714	mg/L	4.101	0.01918	0.46773	4.1015	4.1199	4.0815
Hg1849	mg/L	1.015	0.00207	0.20393	1.0131	1.0172	1.0148
Hg1942	mg/L	1.0069	0.00048	0.04765	1.0064	1.0073	1.007
Li6707	mg/L	0.83399	0.0052	0.62399	0.83192	0.83991	0.83014
Mn2576	mg/L	3.9237	0.01316	0.33537	3.9093	3.9352	3.9266
Mn2593	mg/L	3.9249	0.01439	0.3666	3.9096	3.9382	3.9268
Mn4033	mg/L	3.9931	0.03326	0.83291	3.994	4.0259	3.9594
Mo2020	mg/L	0.78287	0.0016	0.20392	0.78125	0.78294	0.78444
Mo2816	mg/L	0.75387	0.00734	0.97422	0.74876	0.76229	0.75056
Ni2216	mg/L	0.77215	0.00221	0.28567	0.77058	0.77119	0.77467
Ni2303	mg/L	0.76824	0.00076	0.09874	0.76756	0.76812	0.76906
Ni2316	mg/L	0.76724	0.00305	0.39709	0.76491	0.76612	0.77069
P_1774	mg/L	8.1244	0.02476	0.30472	8.1116	8.1086	8.1529
P_2149	mg/L	8.0936	0.03611	0.44611	8.1235	8.0535	8.1039
Pb2169	mg/L	0.7724	0.0108	1.4	0.7706	0.7625	0.784
Pb2203	mg/L	0.77565	0.00112	0.14504	0.77439	0.77601	0.77655
Sb2068	mg/L	0.80314	0.00387	0.48213	0.80716	0.80283	0.79944

Sb2175	mg/L	0.80607	0.00859	1.0663	0.80009	0.81592	0.8022
Se1960	mg/L	0.79074	0.00488	0.61691	0.78944	0.78665	0.79614
Se2039	mg/L	0.79709	0.00711	0.89165	0.79024	0.79661	0.80443
Si2516	mg/L	8.1143	0.03794	0.46761	8.0708	8.1404	8.1316
Si2881	mg/L	7.9941	0.02215	0.2771	7.9697	8.0129	7.9997
Sn1899	mg/L	0.77482	0.0068	0.87808	0.78266	0.77129	0.77051
Sr3464	mg/L	0.7704	0.0065	0.84316	0.76295	0.77338	0.77487
Sr4077	mg/L	0.79655	0.004	0.50267	0.79339	0.80106	0.79522
Te2142	mg/L	1.9908	0.00166	0.08357	1.9905	1.9893	1.9926
Ti3349	mg/L	0.80407	0.00448	0.55655	0.79973	0.80867	0.80381
Ti3361	mg/L	0.80198	0.00398	0.49613	0.79799	0.80595	0.80199
Tl1908	mg/L	0.76664	0.00946	1.2341	0.76202	0.76037	0.77752
U_3670	mg/L	1.9825	0.02798	1.4111	1.9696	2.0146	1.9633
U_3859	mg/L	2.0244	0.01558	0.76973	2.0076	2.0275	2.0383
V_29240	mg/L	0.80438	0.00303	0.37674	0.80094	0.80665	0.80554
Zn2062	mg/L	0.76402	0.00183	0.23995	0.76349	0.76251	0.76606
Zn2138	mg/L	0.78588	0.00134	0.17075	0.78469	0.78561	0.78734
Zn3345	mg/L	0.78899	0.04709	5.968	0.7728	0.75214	0.84204

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=ICSA
Username=Ron Hunt
Comment=ICP-200.7-W-D
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 11:22:47
Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	443.61	1.241	0.27975	443.55	442.4	444.88
Ca3181	mg/L	461.5	0.57006	0.12352	461.3	462.15	461.06
Mg2790	mg/L	504.37	0.31958	0.06336	504.2	504.74	504.18
Mg2852	mg/L	424.47	2.1535	0.50735	426.4	422.15	424.85
K_7664	mg/L	0.03311	0.01195	36.081	0.02416	0.02849	0.04667
K_7698	mg/L	0.03951	0.02359	59.698	0.06409	0.03738	0.01706
Na5895	mg/L	0.1135	0.0006	0.5467	0.1129	0.1134	0.1141
Na8183	mg/L	0.05561	0.0952	171.18	0.1407	0.07336	-0.04721
Ag3280	mg/L	0.00165	0.0018	109.32	0.00138	0.00357	0
Al1670	mg/L	115	0.11171	0.09714	114.89	114.98	115.12
Al3961	mg/L	497.79	3.9805	0.79962	494.17	502.05	497.15
As1890	mg/L	0.00312	0.00632	202.67	-0.00056	-0.0005	0.01041
As1937	mg/L	-0.01686	0.01093	64.801	-0.02872	-0.00721	-0.01465
Au2427	mg/L	-0.01119	0.0036	32.217	-0.01517	-0.00816	-0.01023
Au2675	mg/L	0.00626	0.00943	150.53	0.01695	-0.00089	0.00273
B_2089	mg/L	0.01206	0.00173	14.344	0.0138	0.01204	0.01034
B_2497	mg/L	-0.00961	0.00143	14.935	-0.01092	-0.00983	-0.00807
Ba4554	mg/L	0.00023	0.00004	18.59	0.00019	0.00024	0.00027
Ba2347	mg/L	-0.03782	0.01787	47.244	-0.05713	-0.03447	-0.02186
Be3130	mg/L	i .00015	0.00006	39.256	i .00020	i .00009	i .00016
Be3131	mg/L	i -.00019	0.00003	15.885	i -.00021	i -.00020	i -.00016
Cd2144	mg/L	-0.00357	0.00025	7.111	-0.00333	-0.00384	-0.00355
Cd2288	mg/L	0.00216	0.00034	15.939	0.00255	0.00205	0.00188
Co2286	mg/L	-0.00304	0.00124	40.889	-0.0032	-0.00172	-0.00419
Co2388	mg/L	0.04337	0.00282	6.4935	0.04595	0.04036	0.04379
Cr2055	mg/L	-0.03323	0.00014	0.43445	-0.03335	-0.03327	-0.03307
Cr2666	mg/L	-0.00108	0.00411	380.21	-0.00577	0.0006	0.00192
Cr2677	mg/L	0.00508	0.00093	18.213	0.00407	0.00528	0.00589
Cu2199	mg/L	-0.19611	0.00573	2.9199	-0.19626	-0.19031	-0.20175
Cu3247	mg/L	0.00037	0.00127	347.51	0.00167	-0.00087	0.00029
Cu3273	mg/L	-0.00382	0.00505	132.24	0.00179	-0.008	-0.00525
Fe2599	mg/L	172.34	1.6956	0.98387	172.11	170.78	174.15

Fe2714	mg/L	179.74	0.27564	0.15335	179.51	180.05	179.67
Hg1849	mg/L	0.00394	0.0018	45.695	0.00433	0.00552	0.00198
Hg1942	mg/L	-0.00737	0.00386	52.345	-0.00296	-0.0101	-0.00905
Li6707	mg/L	0.01573	0.00009	0.5434	0.01572	0.01565	0.01583
Mn2576	mg/L	-0.00321	0.00013	4.11	-0.00306	-0.00327	-0.00329
Mn2593	mg/L	-0.00733	0.00129	17.576	-0.00605	-0.00863	-0.0073
Mn4033	mg/L	0.00085	0.00864	1017.8	-0.00913	0.00563	0.00605
Mo2020	mg/L	0.00543	0.001	18.337	0.0062	0.0058	0.00431
Mo2816	mg/L	-0.48603	0.00454	0.93449	-0.49042	-0.48135	-0.48632
Ni2216	mg/L	0.00069	0.00076	110.03	-0.0001	0.00142	0.00075
Ni2303	mg/L	0.00151	0.00026	17.345	0.00124	0.00151	0.00176
Ni2316	mg/L	0.00188	0.00083	43.822	0.00179	0.00111	0.00275
P_1774	mg/L	-0.001	0.00384	384.27	-0.00541	0.00084	0.00158
P_2149	mg/L	0.08679	0.00511	5.8922	0.08349	0.08419	0.09268
Pb2169	mg/L	-0.0681	0.0513	75.4	-0.0151	-0.0716	-0.1176
Pb2203	mg/L	0.03847	0.01205	31.32	0.0373	0.05106	0.02705
Sb2068	mg/L	0.01656	0.00694	41.873	0.01959	0.00863	0.02148
Sb2175	mg/L	-0.03698	0.00924	24.985	-0.02937	-0.03431	-0.04726
Se1960	mg/L	-0.02497	0.00862	34.507	-0.01629	-0.0251	-0.03353
Se2039	mg/L	0.0081	0.00673	83.111	0.01229	0.01168	0.00033
Si2516	mg/L	0.01855	0.00574	30.955	0.01963	0.02368	0.01235
Si2881	mg/L	0.03759	0.00871	23.177	0.02753	0.04266	0.04258
Sn1899	mg/L	-0.00697	0.00369	52.904	-0.00894	-0.00926	-0.00272
Sr3464	mg/L	0.00306	0.00323	105.58	0.00678	0.00099	0.0014
Sr4077	mg/L	0.00418	0.00006	1.3994	0.00421	0.00422	0.00411
Te2142	mg/L	0.01878	0.00457	24.331	0.0137	0.02255	0.02008
Ti3349	mg/L	0.00511	0.00022	4.209	0.00529	0.00487	0.00518
Ti3361	mg/L	0.00656	0.00077	11.755	0.00737	0.00647	0.00584
Tl1908	mg/L	-0.0054	0.00088	16.265	-0.00549	-0.00448	-0.00623
U_3670	mg/L	-0.15792	0.07544	47.769	-0.24265	-0.13301	-0.09808
U_3859	mg/L	-0.0097	0.02685	276.98	-0.03828	0.01501	-0.00582
V_29240	mg/L	0.0051	0.00122	23.989	0.00383	0.00627	0.0052
Zn2062	mg/L	0.00247	0.00028	11.287	0.00228	0.00235	0.00279
Zn2138	mg/L	0.00243	0.00018	7.3193	0.00263	0.00232	0.00233
Zn3345	mg/L	-0.02128	0.02543	119.49	0.00602	-0.0443	-0.02556

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=ICSAB
Username=Ron Hunt
Comment=ICP-200.7-W-D
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 11:27:07
Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	440.51	1.6605	0.37696	440.33	438.95	442.25
Ca3181	mg/L	458.03	1.253	0.27357	456.73	459.24	458.11
Mg2790	mg/L	499.02	0.75438	0.15117	498.38	499.85	498.83
Mg2852	mg/L	424.19	2.596	0.612	424.36	421.51	426.69
K_7664	mg/L	20.363	0.22058	1.0832	20.143	20.584	20.362
K_7698	mg/L	20.315	0.21115	1.0394	20.078	20.484	20.382
Na5895	mg/L	20.37	0.2242	1.101	20.15	20.6	20.35
Na8183	mg/L	20.205	0.09585	0.47436	20.143	20.316	20.157
Ag3280	mg/L	0.95206	0.00966	1.0146	0.94314	0.96232	0.95073
Al1670	mg/L	114.48	0.33735	0.29467	114.14	114.82	114.49
Al3961	mg/L	490.21	5.1478	1.0501	485.77	495.85	489.02
As1890	mg/L	0.97514	0.01624	1.6654	0.9626	0.99349	0.96934
As1937	mg/L	0.96689	0.00549	0.5676	0.9615	0.97247	0.96669
Au2427	mg/L	0.86936	0.00247	0.28459	0.8685	0.86743	0.87215
Au2675	mg/L	0.9143	0.00763	0.83403	0.91722	0.92004	0.90565

B_2089	mg/L	0.94573	0.00245	0.2595	0.94301	0.94642	0.94777
B_2497	mg/L	0.946	0.00674	0.71221	0.94078	0.95361	0.94361
Ba4554	mg/L	0.4692	0.00451	0.96194	0.4675	0.47432	0.46579
Ba2347	mg/L	0.40939	0.01694	4.1367	0.42752	0.39398	0.40667
Be3130	mg/L	i .45591	0.00274	0.60208	i .45363	i .45896	i .45515
Be3131	mg/L	i .45322	0.00267	0.59	i .45269	i .45612	i .45085
Cd2144	mg/L	0.83717	0.0049	0.58483	0.83395	0.8428	0.83475
Cd2288	mg/L	0.9302	0.00291	0.31265	0.9269	0.93132	0.93238
Co2286	mg/L	0.41932	0.00109	0.25891	0.41835	0.42049	0.41912
Co2388	mg/L	0.46931	0.00394	0.83858	0.46977	0.47299	0.46516
Cr2055	mg/L	0.41218	0.00076	0.18318	0.41145	0.41296	0.41213
Cr2666	mg/L	0.45518	0.00876	1.9246	0.44694	0.46438	0.45422
Cr2677	mg/L	0.44714	0.00292	0.65316	0.4438	0.44922	0.44841
Cu2199	mg/L	0.19962	0.00094	0.4699	0.19993	0.19857	0.20037
Cu3247	mg/L	0.47905	0.00374	0.7807	0.47568	0.48307	0.47841
Cu3273	mg/L	0.46494	0.00789	1.6962	0.45675	0.47248	0.46557
Fe2599	mg/L	171.17	0.97739	0.57101	170.25	171.06	172.2
Fe2714	mg/L	178.71	0.4868	0.2724	178.16	179.09	178.88
Hg1849	mg/L	0.36444	0.00026	0.0723	0.36462	0.36457	0.36414
Hg1942	mg/L	0.3409	0.00523	1.5336	0.33491	0.34457	0.34321
Li6707	mg/L	1.0481	0.01321	1.2601	1.0361	1.0623	1.046
Mn2576	mg/L	0.44474	0.00333	0.74862	0.44106	0.44755	0.4456
Mn2593	mg/L	0.43869	0.00223	0.50751	0.43613	0.44016	0.43979
Mn4033	mg/L	0.51229	0.01684	3.2866	0.49917	0.53127	0.50641
Mo2020	mg/L	0.88969	0.00045	0.05107	0.88918	0.88987	0.89003
Mo2816	mg/L	0.40664	0.00758	1.8646	0.39979	0.40535	0.41479
Ni2216	mg/L	0.83639	0.00255	0.30494	0.83505	0.83933	0.83478
Ni2303	mg/L	0.84254	0.00249	0.296	0.84051	0.84532	0.84178
Ni2316	mg/L	0.8396	0.00285	0.33926	0.83874	0.84278	0.83728
P_1774	mg/L	9.4658	0.00795	0.08395	9.4567	9.4714	9.4692
P_2149	mg/L	9.4295	0.01799	0.19084	9.4098	9.4451	9.4336
Pb2169	mg/L	0.8521	0.0558	6.543	0.9103	0.8469	0.7992
Pb2203	mg/L	0.89361	0.00487	0.54527	0.88807	0.89726	0.89548
Sb2068	mg/L	0.97646	0.0058	0.594	0.97544	0.97123	0.9827
Sb2175	mg/L	0.92769	0.00943	1.0164	0.91788	0.92851	0.93668

Se1960	mg/L	0.91978	0.02061	2.241	0.90207	0.91485	0.94241
Se2039	mg/L	0.94971	0.01462	1.5394	0.95541	0.9331	0.96062
Si2516	mg/L	9.8157	0.06541	0.66638	9.7737	9.8911	9.7824
Si2881	mg/L	9.7579	0.04484	0.45953	9.715	9.8044	9.7544
Sn1899	mg/L	0.85077	0.00124	0.14578	0.8495	0.85198	0.85084
Sr3464	mg/L	0.87793	0.00545	0.62052	0.87178	0.87985	0.88216
Sr4077	mg/L	0.94539	0.00808	0.8551	0.94026	0.95471	0.9412
Te2142	mg/L	0.9331	0.00792	0.84908	0.92434	0.93977	0.9352
Ti3349	mg/L	0.93125	0.00539	0.57858	0.92752	0.93743	0.9288
Ti3361	mg/L	0.93434	0.00618	0.66104	0.93092	0.94147	0.93064
Tl1908	mg/L	0.83741	0.00463	0.55302	0.84046	0.83969	0.83208
U_3670	mg/L	0.77918	0.02708	3.475	0.77327	0.75554	0.80872
U_3859	mg/L	0.90967	0.02864	3.1479	0.90658	0.93973	0.88271
V_29240	mg/L	0.45988	0.0029	0.63112	0.45756	0.46314	0.45895
Zn2062	mg/L	0.82141	0.00247	0.30056	0.82034	0.82423	0.81965
Zn2138	mg/L	0.92375	0.0016	0.17342	0.92232	0.92548	0.92345
Zn3345	mg/L	0.89744	0.04785	5.3316	0.89315	0.94728	0.85187

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=Blank
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 15:17:57
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	Cts/S	1.8354	2.2092	120.37	3.8545	-0.52424	2.1758
Ca3181	Cts/S	4.4	1.0896	24.763	5.5111	3.3333	4.3556
Mg2790	Cts/S	6.6	0.90139	13.657	7.6	6.35	5.85
Mg2852	Cts/S	11.4	1.9641	17.229	13.55	9.7	10.95
K_7664	Cts/S	52.37	11.354	21.679	65.289	43.978	47.844
K_7698	Cts/S	179.96	10.333	5.7418	181.57	189.39	168.91
Na5895	Cts/S	154.7	7.614	4.921	151.9	163.3	148.9
Na8183	Cts/S	152.37	20.512	13.462	174.2	133.5	149.4
Ag3280	Cts/S	-2.4	5.5495	231.23	1.95	-8.65	-0.5
Al1670	Cts/S	0.3622	0.3804	105.03	-0.05333	0.69329	0.44664
Al3961	Cts/S	65.083	10.915	16.771	73.5	69	52.75
As1890	Cts/S	0.31109	0.20157	64.796	0.5333	0.25998	0.13999
As1937	Cts/S	-0.59681	0.25166	42.167	-0.34387	-0.5994	-0.84717
Au2427	Cts/S	2.4667	0.40415	16.384	2.9	2.1	2.4
Au2675	Cts/S	-1.4333	1.4785	103.15	-1.1	-0.15	-3.05
B_2089	Cts/S	4.1575	0.3564	8.5724	4.3464	4.3797	3.7464
B_2497	Cts/S	4.2833	4.8001	112.06	-0.5	9.1	4.25
Ba4554	Cts/S	29.55	9.7964	33.152	35.65	18.25	34.75
Ba2347	Cts/S	6.6167	0.82513	12.47	5.7	7.3	6.85
Be3130	Cts/S	i 22.750	1.9468	8.5573	i 24.950	i 22.050	i 21.250
Be3131	Cts/S	i -12.633	5.0647	40.09	i -9.2000	i -10.250	i -18.450
Cd2144	Cts/S	8.4794	0.73789	8.7021	7.7506	8.4617	9.2261
Cd2288	Cts/S	2.5909	0.35087	13.542	2.9265	2.2265	2.6198
Co2286	Cts/S	-3.0198	0.13282	4.3984	-3.0998	-3.0931	-2.8665
Co2388	Cts/S	-2.4476	1.4445	59.017	-1.6714	-4.1143	-1.5571
Cr2055	Cts/S	0.25109	0.54293	216.23	0.87328	-0.12666	0.00667
Cr2666	Cts/S	7.05	3.214	45.589	4.95	5.45	10.75
Cr2677	Cts/S	-1.5778	1.3977	88.59	-2.4667	0.03333	-2.3
Cu2199	Cts/S	-3.5598	0.9261	26.016	-4.6264	-2.9598	-3.0931
Cu3247	Cts/S	8.2111	1.7017	20.725	10.167	7.4	7.0667
Cu3273	Cts/S	13.567	4.0763	30.046	9.25	14.1	17.35
Fe2599	Cts/S	2.4333	0.02887	1.1863	2.45	2.4	2.45
Fe2714	Cts/S	3.9667	1.9662	49.567	1.75	4.65	5.5

Hg1849	Cts/S	1.2888	0.55335	42.935	1.8465	0.73995	1.2799
Hg1942	Cts/S	-0.21332	0.26963	126.4	-0.10666	-0.01333	-0.51997
Li6707	Cts/S	68.826	4.9543	7.1983	64.156	74.022	68.3
Mn2576	Cts/S	5.5	4.6872	85.222	6.8	9.4	0.3
Mn2593	Cts/S	-1.05	1.1303	107.64	-0.1	-0.75	-2.3
Mn4033	Cts/S	259.03	8.1615	3.1508	265.75	261.4	249.95
Mo2020	Cts/S	1.7221	0.1953	11.341	1.4999	1.8665	1.7999
Mo2816	Cts/S	-7.25	1.8173	25.066	-6.8	-5.7	-9.25
Ni2216	Cts/S	1.4044	1.0806	76.948	0.34664	1.3599	2.5065
Ni2303	Cts/S	-1.2066	1.6419	136.08	-1.9332	0.67329	-2.3598
Ni2316	Cts/S	4.9752	1.1449	23.012	6.2196	4.7397	3.9664
P_1774	Cts/S	-0.2311	0.48095	208.12	0.26665	-0.69329	-0.26665
P_2149	Cts/S	0.02222	1.6203	7291.8	-0.17777	-1.4888	1.7332
Pb2169	Cts/S	1.981	0.3997	20.18	2.355	2.027	1.56
Pb2203	Cts/S	2.5473	0.2959	11.616	2.5665	2.2423	2.8331
Sb2068	Cts/S	2.5443	0.10248	4.0279	2.6132	2.4265	2.5932
Sb2175	Cts/S	0.60663	1.06	174.74	1.6599	0.61996	-0.45997
Se1960	Cts/S	0.23332	0.51017	218.66	0.47997	0.5733	-0.35331
Se2039	Cts/S	0.96438	1.0613	110.05	1.0266	1.9932	-0.12666
Si2516	Cts/S	3.2167	2.9851	92.801	6.05	0.1	3.5
Si2881	Cts/S	20.983	3.7324	17.787	22.4	16.75	23.8
Sn1899	Cts/S	-0.29109	0.30037	103.19	-0.27332	-0.59996	0
Sr3464	Cts/S	-2.35	8.8288	375.69	-6.6	-8.25	7.8
Sr4077	Cts/S	13.2	4.912	37.212	7.7	14.75	17.15
Te2142	Cts/S	-5.8418	0.65554	11.222	-6.5729	-5.6463	-5.3063
Ti3349	Cts/S	14	4.3863	31.331	19	10.8	12.2
Ti3361	Cts/S	151.9	6.149	4.048	155.5	144.8	155.4
Tl1908	Cts/S	-0.37331	0.61097	163.66	0.29331	-0.90661	-0.50663
U_3670	Cts/S	31.8	1.6462	5.1768	29.9	32.7	32.8
U_3859	Cts/S	-30.4	6.3222	20.797	-23.1	-34.1	-34
V_29240	Cts/S	3.5167	3.0172	85.796	0.05	4.95	5.55
Zn2062	Cts/S	0.08444	0.71959	852.21	-0.69329	0.21999	0.72662
Zn2138	Cts/S	9.8349	0.39383	4.0045	10.166	9.9393	9.3994
Zn3345	Cts/S	3.2333	3.188	98.598	6.1	3.8	-0.2

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CalibStd-1
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 15:21:50
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	Cts/S	96724	134.02	0.13856	96581	96744	96846
Ca3181	Cts/S	9198	4.8433	0.05266	9194.5	9196	9203.5
Mg2790	Cts/S	10658	21.606	0.20272	10633	10667	10673
Mg2852	Cts/S	242340	762.94	0.31482	243170	242190	241670
K_7664	Cts/S	34610	196.13	0.56668	34788	34642	34400
K_7698	Cts/S	17228	106.14	0.61612	17318	17256	17111
Na5895	Cts/S	146800	1053	0.7172	147700	147100	145600
Na8183	Cts/S	6509.8	15.789	0.24254	6527.9	6498.6	6503
Fe2599	Cts/S	8627.8	14.929	0.17303	8624.4	8614.9	8644.2
Fe2714	Cts/S	572.82	5.6738	0.99051	579.35	569.12	569.97
Li6707	Cts/S	49481	401.71	0.81186	49834	49565	49044
P_1774	Cts/S	594.03	2.3195	0.39047	591.45	594.7	595.95
P_2149	Cts/S	536.13	2.4576	0.4584	535.28	538.9	534.21

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CalibStd-2
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 15:25:38
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ag3280	Cts/S	565.99	2.5922	0.45799	564.17	564.85	568.96
Al1670	Cts/S	1120.8	4.5263	0.40382	1126.1	1118.1	1118.3
Al3961	Cts/S	9164.3	55.866	0.60961	9155.5	9224.1	9113.4
Au2427	Cts/S	2911.6	13.942	0.47882	2900.9	2927.4	2906.5
Au2675	Cts/S	2688.6	19.621	0.72976	2667.8	2706.7	2691.5
Ba4554	Cts/S	682030	3752	0.55012	678340	681910	685840
Ba2347	Cts/S	475.63	2.9986	0.63045	479.09	473.8	474
Cr2055	Cts/S	6990.9	3.4293	0.04905	6986.9	6992.6	6993.1
Cr2666	Cts/S	1899.9	15.371	0.80907	1885.5	1916.1	1898
Cr2677	Cts/S	8817.9	17.798	0.20184	8797.4	8827.2	8829.1
Cu2199	Cts/S	1197.3	3.3746	0.28185	1200.3	1197.9	1193.7
Cu3247	Cts/S	12990	35.957	0.2768	12957	13028	12985
Cu3273	Cts/S	9112.9	27.785	0.30489	9081.2	9133.1	9124.5
Hg1849	Cts/S	83.424	0.6478	0.77652	83.238	82.889	84.144
Hg1942	Cts/S	51.573	0.0875	0.16967	51.673	51.512	51.533
Ni2216	Cts/S	7357.4	1.6204	0.02202	7356.6	7356.4	7359.3
Ni2303	Cts/S	2502.8	5.9187	0.23648	2496	2505.4	2507
Ni2316	Cts/S	3864.3	2.9871	0.0773	3862.9	3862.2	3867.7

Te2142	Cts/S	628.65	1.6912	0.26902	626.71	629.81	629.45
Tl1908	Cts/S	549.33	2.9322	0.53377	548.47	546.93	552.6

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CalibStd-3
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 15:29:29
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
As1890	Cts/S	492.01	2.8444	0.57813	493.23	488.75	494.04
As1937	Cts/S	493.01	2.3751	0.48175	495.31	493.16	490.57
B_2089	Cts/S	3029	11.074	0.36558	3038.5	3016.9	3031.8
B_2497	Cts/S	10903	37.965	0.3482	10941	10865	10904
Be3130	Cts/S	i 284130.	748.56	0.26345	i 283600.	i 284990.	i 283820.
Be3131	Cts/S	i 146850.	435.8	0.29677	i 146340.	i 147110.	i 147080.
Cd2144	Cts/S	15960	31.313	0.1962	15986	15925	15968
Cd2288	Cts/S	10295	22.495	0.21849	10308	10269	10309
Co2286	Cts/S	6127.2	20.311	0.33149	6140.1	6103.8	6137.7
Co2388	Cts/S	6910.8	11.89	0.17205	6912	6898.3	6922
Mn2576	Cts/S	56626	78.768	0.1391	56620	56550	56707
Mn2593	Cts/S	55759	186.28	0.33408	55640	55663	55973
Mn4033	Cts/S	1961.5	5.5451	0.2827	1965	1955.1	1964.3

Mo2020	Cts/S	3249.9	13.535	0.41647	3244.2	3240.1	3265.3
Mo2816	Cts/S	4662.2	15.063	0.32308	4648.4	4660	4678.3
Pb2169	Cts/S	149	1.201	0.806	150.4	148.1	148.6
Pb2203	Cts/S	1054.7	3.0383	0.28807	1056.4	1051.2	1056.6
Sb2068	Cts/S	553.66	1.8712	0.33797	554.08	551.61	555.28
Sb2175	Cts/S	584.64	0.39268	0.06717	584.8	584.19	584.93
Se1960	Cts/S	356.8	1.6725	0.46876	358.18	354.94	357.27
Se2039	Cts/S	204.46	0.55332	0.27062	205.02	204.46	203.91
Si2516	Cts/S	6032.1	29.565	0.49013	5998.3	6044.5	6053.4
Si2881	Cts/S	4574.9	29.504	0.6449	4551.4	4565.2	4608
Sn1899	Cts/S	878.21	3.497	0.3982	877.67	875.01	881.94
Sr3464	Cts/S	11624	16.362	0.14076	11618	11611	11642
Sr4077	Cts/S	1113100	2027	0.1821	1111000	1113400	1115000
Ti3349	Cts/S	60269	117.66	0.19522	60136	60307	60362
Ti3361	Cts/S	51938	72.568	0.13972	51879	51916	52019
V_29240	Cts/S	14391	21.361	0.14843	14382	14376	14416
Zn2062	Cts/S	7512.5	16.419	0.21856	7517.7	7494.1	7525.6
Zn2138	Cts/S	12083	43.011	0.35597	12124	12038	12086
Zn3345	Cts/S	728.95	9.8742	1.3546	729.93	718.62	738.29

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CalibStd-4
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 15:33:20
Sample Type=ReSlope
Mode=IR
CorrFactor=1.000

Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
U_3670	Cts/S	1137.2	13.497	1.1869	1121.8	1147.1	1142.6
U_3859	Cts/S	2017.5	10.991	0.5448	2016.4	2029	2007.1

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCV
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 15:37:14
Sample Type=QC
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	26.002	0.03542	0.13621	25.972	25.993	26.041	Chk Pass		
Ca3181	mg/L	26.134	0.07184	0.27488	26.072	26.118	26.213	Chk Pass		
Mg2790	mg/L	25.716	0.10095	0.39254	25.624	25.7	25.824	Chk Pass		
Mg2852	mg/L	25.753	0.05033	0.19543	25.695	25.785	25.78	Chk Pass		
K_7664	mg/L	25.481	0.01645	0.06458	25.488	25.462	25.493	Chk Pass		
K_7698	mg/L	25.432	0.05998	0.23583	25.393	25.402	25.501	Chk Pass		
Na5895	mg/L	25.36	0.0338	0.1334	25.39	25.37	25.32	Chk Pass		
Na8183	mg/L	25.645	0.1163	0.45349	25.621	25.542	25.771	Chk Pass		
Ag3280	mg/L	1.0053	0.00274	0.27221	1.0037	1.0038	1.0085	Chk Pass		

Al1670	mg/L	2.5069	0.00883	0.35231	2.5051	2.4991	2.5165	Chk Pass
Al3961	mg/L	2.522	0.00894	0.35467	2.5158	2.5322	2.5178	Chk Pass
As1890	mg/L	2.541	0.01023	0.40279	2.5373	2.5526	2.5331	Chk Pass
As1937	mg/L	2.5421	0.00507	0.19933	2.5471	2.5423	2.537	Chk Pass
Au2427	mg/L	2.4489	0.02325	0.94953	2.4252	2.4498	2.4717	Chk Pass
Au2675	mg/L	2.4548	0.02453	0.9991	2.4266	2.4674	2.4705	Chk Pass
B_2089	mg/L	2.5085	0.006	0.23937	2.5058	2.5044	2.5154	Chk Pass
B_2497	mg/L	2.5067	0.01041	0.41513	2.4954	2.5158	2.509	Chk Pass
Ba4554	mg/L	2.4972	0.00814	0.32579	2.5039	2.4995	2.4881	Chk Pass
Ba2347	mg/L	2.5093	0.0275	1.096	2.4971	2.49	2.5408	Chk Pass
Be3130	mg/L	i 1.2575	0.00187	0.14886	i 1.2554	i 1.2584	i 1.2588	Chk Pass
Be3131	mg/L	i 1.2655	0.00159	0.12554	i 1.2637	i 1.2665	i 1.2663	Chk Pass
Cd2144	mg/L	2.4646	0.00301	0.12215	2.4677	2.4617	2.4643	Chk Pass
Cd2288	mg/L	2.4916	0.00113	0.04525	2.4904	2.4925	2.4921	Chk Pass
Co2286	mg/L	2.4802	0.00394	0.15876	2.4844	2.4766	2.4796	Chk Pass
Co2388	mg/L	2.4387	0.00451	0.18511	2.4337	2.4397	2.4426	Chk Pass
Cr2055	mg/L	2.5031	0.0111	0.44354	2.5039	2.4917	2.5138	Chk Pass
Cr2666	mg/L	2.4656	0.01449	0.5875	2.4488	2.4746	2.4732	Chk Pass
Cr2677	mg/L	2.4698	0.00735	0.29762	2.4635	2.468	2.4779	Chk Pass
Cu2199	mg/L	2.3282	0.00324	0.13916	2.3311	2.3288	2.3247	Chk Pass
Cu3247	mg/L	2.4514	0.0022	0.08962	2.4489	2.4525	2.4529	Chk Pass
Cu3273	mg/L	2.4207	0.00682	0.28173	2.4181	2.4156	2.4285	Chk Pass
Fe2599	mg/L	2.5822	0.01162	0.44999	2.576	2.575	2.5956	Chk Pass
Fe2714	mg/L	2.5794	0.02318	0.89879	2.553	2.5963	2.589	Chk Pass
Hg1849	mg/L	1.0126	0.00523	0.51625	1.0067	1.0144	1.0166	Chk Pass
Hg1942	mg/L	1.0227	0.00102	0.09965	1.0238	1.0225	1.0218	Chk Pass
Li6707	mg/L	1.2687	0.00224	0.17647	1.2682	1.2711	1.2667	Chk Pass
Mn2576	mg/L	2.4689	0.00522	0.2116	2.4632	2.4702	2.4734	Chk Pass
Mn2593	mg/L	2.4768	0.0032	0.1293	2.4749	2.4749	2.4805	Chk Pass
Mn4033	mg/L	2.4773	0.0369	1.4894	2.4372	2.5098	2.4849	Chk Pass
Mo2020	mg/L	2.5186	0.00609	0.24164	2.5245	2.5123	2.5188	Chk Pass
Mo2816	mg/L	2.486	0.01773	0.71308	2.4656	2.4949	2.4976	Chk Pass
Ni2216	mg/L	2.4737	0.00448	0.18126	2.4784	2.4695	2.473	Chk Pass
Ni2303	mg/L	2.4271	0.00905	0.37298	2.4279	2.4176	2.4357	Chk Pass
Ni2316	mg/L	2.4442	0.00582	0.23797	2.447	2.4375	2.4481	Chk Pass

P_1774	mg/L	2.522	0.01453	0.57608	2.5147	2.5127	2.5388	Chk Pass
P_2149	mg/L	2.5263	0.0363	1.437	2.4876	2.5317	2.5596	Chk Pass
Pb2169	mg/L	2.45	0.0454	1.855	2.466	2.398	2.484	Chk Pass
Pb2203	mg/L	2.462	0.00567	0.23039	2.4615	2.4566	2.4679	Chk Pass
Sb2068	mg/L	2.5197	0.01209	0.47966	2.5176	2.5087	2.5326	Chk Pass
Sb2175	mg/L	2.5158	0.00701	0.27879	2.5133	2.5104	2.5237	Chk Pass
Se1960	mg/L	2.5074	0.00512	0.20415	2.5127	2.507	2.5025	Chk Pass
Se2039	mg/L	2.4567	0.0095	0.38679	2.4615	2.4458	2.4629	Chk Pass
Si2516	mg/L	5.0992	0.02013	0.39471	5.0932	5.0827	5.1216	Chk Pass
Si2881	mg/L	5.0841	0.02201	0.43297	5.059	5.0999	5.0935	Chk Pass
Sn1899	mg/L	2.4689	0.00878	0.35546	2.4688	2.4601	2.4777	Chk Pass
Sr3464	mg/L	2.5019	0.01141	0.45609	2.4919	2.4994	2.5143	Chk Pass
Sr4077	mg/L	2.5002	0.01653	0.661	2.4816	2.506	2.5131	Chk Pass
Te2142	mg/L	2.4919	0.00699	0.28056	2.4997	2.4862	2.4898	Chk Pass
Ti3349	mg/L	2.4883	0.01195	0.48013	2.4745	2.495	2.4954	Chk Pass
Ti3361	mg/L	2.4973	0.00643	0.25749	2.4902	2.5027	2.4991	Chk Pass
Tl1908	mg/L	2.4452	0.0178	0.72798	2.451	2.4252	2.4593	Chk Pass
U_3670	mg/L	2.5078	0.02056	0.81966	2.4991	2.5313	2.493	Chk Pass
U_3859	mg/L	2.5358	0.01949	0.76847	2.5489	2.5134	2.545	Chk Pass
V_29240	mg/L	2.5233	0.00226	0.08944	2.5209	2.5254	2.5237	Chk Pass
Zn2062	mg/L	2.4742	0.0051	0.20601	2.4766	2.4683	2.4776	Chk Pass
Zn2138	mg/L	2.4891	0.00531	0.21348	2.4874	2.4848	2.495	Chk Pass
Zn3345	mg/L	2.4951	0.03446	1.381	2.5346	2.4795	2.4711	Chk Pass

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCB
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=

Run Time=2/6/2018 15:40:55
Sample Type=QC
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	0.00546	0.00219	40.104	0.00622	0.00716	0.00299	Chk Pass		
Ca3181	mg/L	0.02228	0.00404	18.15	0.02498	0.02421	0.01763	Chk Pass		
Mg2790	mg/L	0.00817	0.00984	120.34	-0.00318	0.0135	0.0142	Chk Pass		
Mg2852	mg/L	0.00497	0.00112	22.485	0.00599	0.00514	0.00377	Chk Pass		
K_7664	mg/L	0.01651	0.01086	65.781	0.02099	0.00413	0.02441	Chk Pass		
K_7698	mg/L	-0.00722	0.0101	139.95	-0.01805	-0.00556	0.00195	Chk Pass		
Na5895	mg/L	0.0812	0.008	9.877	0.0896	0.0802	0.0737	Chk Pass		
Na8183	mg/L	-0.08733	0.18119	207.47	-0.01256	-0.29394	0.0445	Chk Pass		
Ag3280	mg/L	0.00059	0.00203	345.69	0.00288	-0.00011	-0.00101	None		
Al1670	mg/L	0.00015	0.00129	842.89	0.00016	0.00144	-0.00114	None		
Al3961	mg/L	0.00045	0.00271	602.53	0.00358	-0.00106	-0.00117	Chk Pass		
As1890	mg/L	-0.00058	0.00532	915.06	-0.00171	-0.00524	0.00521	None		
As1937	mg/L	-0.00215	0.00189	87.76	-0.00206	-0.00408	-0.00031	None		
Au2427	mg/L	0.00888	0.00456	51.398	0.01217	0.00367	0.01081	None		
Au2675	mg/L	0.01396	0.00287	20.567	0.01549	0.01065	0.01574	None		
B_2089	mg/L	0.00197	0.00194	98.613	0.00178	0.00399	0.00013	Chk Pass		
B_2497	mg/L	0.00333	0.00052	15.6	0.00349	0.00275	0.00375	Chk Pass		
Ba4554	mg/L	0.00054	0.00004	6.6035	0.00057	0.0005	0.00055	None		
Ba2347	mg/L	-0.01177	0.02141	181.9	-0.00713	0.00694	-0.03512	None		
Be3130	mg/L	i .00019	0.00003	16.106	i .00020	i .00015	i .00021	None		
Be3131	mg/L	i -.00001	0.00005	474.06	i .00003	i .00000	i -.00007	None		
Cd2144	mg/L	0.00057	0.00011	20.053	0.00055	0.00069	0.00046	None		
Cd2288	mg/L	0.00086	0.00042	48.783	0.00052	0.00133	0.00074	None		
Co2286	mg/L	0.00043	0.00087	203.04	-0.00057	0.00083	0.00102	None		
Co2388	mg/L	-0.00065	0.00118	180.28	0.0003	-0.00029	-0.00197	None		
Cr2055	mg/L	-0.00002	0.0005	3202.5	-0.00021	0.00055	-0.00039	None		
Cr2666	mg/L	0.00349	0.00744	213.25	0.01053	-0.0043	0.00424	None		

Cr2677	mg/L	0.00255	0.00076	29.789	0.0033	0.00178	0.00257	None
Cu2199	mg/L	0.00476	0.00129	27.136	0.00454	0.00615	0.00359	None
Cu3247	mg/L	0.00044	0.00112	254.99	-0.00082	0.00135	0.00079	None
Cu3273	mg/L	-0.0007	0.00073	104.95	-0.00154	-0.00035	-0.0002	None
Fe2599	mg/L	-0.00068	0.00087	128.71	0.00027	-0.00144	-0.00086	Chk Pass
Fe2714	mg/L	-0.00451	0.01374	304.57	0.00378	-0.02036	0.00305	Chk Pass
Hg1849	mg/L	0.00013	0.00041	319.22	-0.00009	-0.00013	0.0006	None
Hg1942	mg/L	-0.00092	0.00285	310.31	-0.00394	0.00173	-0.00055	None
Li6707	mg/L	-0.0001	0.00053	550.49	0.00019	0.00023	-0.00071	None
Mn2576	mg/L	0.00012	0.00017	150.33	0.00008	0.0003	-0.00004	None
Mn2593	mg/L	0.00049	0.00021	43.282	0.00057	0.00065	0.00025	None
Mn4033	mg/L	-0.02693	0.01128	41.905	-0.02301	-0.03965	-0.01813	None
Mo2020	mg/L	0.00092	0.00143	156.39	0.00033	-0.00013	0.00255	None
Mo2816	mg/L	0.00414	0.00187	45.268	0.00608	0.00234	0.004	None
Ni2216	mg/L	0.00015	0.00026	176.16	0.00009	0.00042	-0.00008	None
Ni2303	mg/L	0.00094	0.00147	155.9	0.00014	0.00264	0.00004	None
Ni2316	mg/L	0.00011	0.0008	702.85	0.00094	-0.00066	0.00007	None
P_1774	mg/L	0.00172	0.00057	33.005	0.00143	0.00238	0.00136	None
P_2149	mg/L	0.00808	0.0035	43.261	0.00681	0.01204	0.0054	None
Pb2169	mg/L	-0.0524	0.0159	30.39	-0.0345	-0.0577	-0.0649	None
Pb2203	mg/L	-0.00378	0.00762	201.57	0.00299	-0.00229	-0.01204	None
Sb2068	mg/L	-0.0006	0.0015	251.69	-0.00228	0.00061	-0.00012	None
Sb2175	mg/L	-0.0053	0.00184	34.723	-0.0067	-0.00322	-0.00598	None
Se1960	mg/L	0.00811	0.00752	92.689	0.00973	0.01468	-0.00008	None
Se2039	mg/L	0.01274	0.01161	91.129	0.02088	0.0179	-0.00056	None
Si2516	mg/L	0.00465	0.00161	34.541	0.00316	0.00445	0.00635	None
Si2881	mg/L	-0.0109	0.0026	23.893	-0.01388	-0.00971	-0.0091	None
Sn1899	mg/L	0.00273	0.00227	82.959	0.00482	0.00032	0.00306	None
Sr3464	mg/L	0.00463	0.00151	32.716	0.0061	0.00308	0.0047	None
Sr4077	mg/L	0.0005	0.00003	6.8272	0.00054	0.00048	0.00048	None
Te2142	mg/L	0.01827	0.00876	47.96	0.00856	0.02559	0.02066	None
Ti3349	mg/L	0.00016	0.00013	77.575	0.00002	0.00019	0.00027	None
Ti3361	mg/L	0.00096	0.00023	23.613	0.00119	0.00073	0.00097	None
Tl1908	mg/L	0.00292	0.00286	97.808	0.00312	-0.00003	0.00567	None
U_3670	mg/L	-0.03104	0.04025	129.67	0.00902	-0.03068	-0.07148	None

U_3859	mg/L	0.0628	0.023	36.628	0.07643	0.07573	0.03624	None
V_29240	mg/L	0.00047	0.00123	259.63	0.00154	-0.00087	0.00075	None
Zn2062	mg/L	0.00049	0.00016	32.483	0.00043	0.00037	0.00067	None
Zn2138	mg/L	0.00078	0.00055	70.094	0.00125	0.00091	0.00018	Chk Pass
Zn3345	mg/L	0.00479	0.0457	954.54	-0.04685	0.02123	0.03999	None

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=MB-118169
Username=Ron Hunt
Comment=ICP-6010-S-T
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 15:48:49
Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	0.09769	0.00407	4.166	0.10239	0.09526	0.09543
Ca3181	mg/L	0.12073	0.01012	8.3819	0.13231	0.1163	0.11359
Mg2790	mg/L	0.00899	0.01992	221.58	0.03171	-0.00545	0.00071
Mg2852	mg/L	0.01115	0.00285	25.52	0.0141	0.01092	0.00843
K_7664	mg/L	0.05342	0.01306	24.438	0.06833	0.04787	0.04406
K_7698	mg/L	0.25335	0.02381	9.3998	0.22686	0.2602	0.27299
Na5895	mg/L	0.1515	0.0074	4.872	0.159	0.1513	0.1443
Na8183	mg/L	-0.20395	0.07095	34.787	-0.12296	-0.25515	-0.23375
Ag3280	mg/L	0.0005	0.0021	419.84	-0.00136	0.00009	0.00278
Al1670	mg/L	0.00509	0.00167	32.834	0.00679	0.00345	0.00504

Al3961	mg/L	0.00171	0.00195	114.16	-0.00042	0.0034	0.00214
As1890	mg/L	-0.00429	0.00075	17.602	-0.00348	-0.00441	-0.00497
As1937	mg/L	-0.00307	0.00423	137.79	-0.0065	-0.00435	0.00165
Au2427	mg/L	0.0193	0.00369	19.105	0.02084	0.02197	0.0151
Au2675	mg/L	0.0278	0.00163	5.881	0.02814	0.02602	0.02924
B_2089	mg/L	0.00322	0.00024	7.5097	0.0035	0.00306	0.0031
B_2497	mg/L	0.004	0.00084	20.897	0.00353	0.0035	0.00496
Ba4554	mg/L	0.00037	0.00011	29.815	0.00048	0.00038	0.00026
Ba2347	mg/L	0.003	0.01381	460.35	-0.01034	0.00209	0.01724
Be3130	mg/L	i .00006	0.00004	69.756	i .00011	i .00005	i .00003
Be3131	mg/L	i -.00016	0.00008	51.49	i -.00019	i -.00024	i -.00007
Cd2144	mg/L	0.00005	0.00008	160.24	0.00013	0	0.00001
Cd2288	mg/L	0.00048	0.00006	12.779	0.00051	0.00051	0.00041
Co2286	mg/L	0.00047	0.00032	69.431	0.00045	0.0008	0.00015
Co2388	mg/L	0.00005	0.00189	3993.8	-0.00076	0.00221	-0.00131
Cr2055	mg/L	0.00144	0.00018	12.553	0.00136	0.00164	0.0013
Cr2666	mg/L	-0.0004	0.00253	632.37	0.0024	-0.00252	-0.00107
Cr2677	mg/L	0.00263	0.00123	46.833	0.00258	0.00389	0.00143
Cu2199	mg/L	-0.00446	0.00122	27.317	-0.00585	-0.00357	-0.00396
Cu3247	mg/L	0.00039	0.00145	376.34	-0.00065	0.00205	-0.00024
Cu3273	mg/L	-0.00261	0.00185	70.707	-0.00067	-0.00435	-0.00281
Fe2599	mg/L	0.01232	0.00069	5.5913	0.01311	0.01186	0.01198
Fe2714	mg/L	0.00524	0.00983	187.54	0.01486	-0.00478	0.00564
Hg1849	mg/L	-0.00141	0.00075	53.429	-0.00197	-0.00055	-0.00169
Hg1942	mg/L	-0.00132	0.00179	135.21	-0.00046	-0.00337	-0.00013
Li6707	mg/L	-0.00076	0.00053	68.819	-0.00137	-0.00054	-0.00039
Mn2576	mg/L	0.00076	0.00024	31.905	0.00097	0.00049	0.00081
Mn2593	mg/L	0.00072	0.00019	25.821	0.00054	0.00073	0.00091
Mn4033	mg/L	-0.05846	0.0115	19.673	-0.06938	-0.05954	-0.04646
Mo2020	mg/L	0.00114	0.00013	11.462	0.00099	0.00123	0.00121
Mo2816	mg/L	0.00478	0.00386	80.723	0.00884	0.00436	0.00115
Ni2216	mg/L	0.00072	0.00097	134.14	0.00023	0.00185	0.0001
Ni2303	mg/L	0.00424	0.0006	14.274	0.00385	0.00493	0.00393
Ni2316	mg/L	0.00052	0.00154	297.13	0.00196	0.00069	-0.0011
P_1774	mg/L	0.01781	0.00251	14.088	0.02017	0.01517	0.01809

P_2149	mg/L	0.01361	0.00937	68.837	0.0236	0.01223	0.00501
Pb2169	mg/L	-0.0223	0.0408	182.8	-0.0695	0.0029	-0.0005
Pb2203	mg/L	-0.00749	0.00458	61.172	-0.00249	-0.01148	-0.0085
Sb2068	mg/L	-0.00102	0.00117	114.35	-0.00234	-0.00012	-0.0006
Sb2175	mg/L	0.00268	0.00601	223.91	-0.00256	0.00924	0.00137
Se1960	mg/L	0.00758	0.00949	125.22	-0.00318	0.01478	0.01114
Se2039	mg/L	0.01541	0.02526	163.91	0.04182	0.01292	-0.00851
Si2516	mg/L	0.00515	0.00087	16.888	0.00604	0.00509	0.0043
Si2881	mg/L	0.00191	0.01194	624.73	-0.00097	0.01503	-0.00833
Sn1899	mg/L	0.02154	0.00235	10.897	0.02169	0.0238	0.01912
Sr3464	mg/L	0.00312	0.00148	47.441	0.00418	0.00143	0.00374
Sr4077	mg/L	0.00036	0.00006	16.387	0.00042	0.00035	0.00031
Te2142	mg/L	0.00945	0.0045	47.617	0.00469	0.01003	0.01364
Ti3349	mg/L	0.0005	0.00026	51.951	0.0008	0.00038	0.00032
Ti3361	mg/L	0.00038	0.0004	105.66	0.00004	0.00027	0.00081
Tl1908	mg/L	-0.00193	0.00436	225.89	-0.00051	0.00154	-0.00683
U_3670	mg/L	-0.02847	0.03175	111.52	0.00164	-0.02541	-0.06164
U_3859	mg/L	0.03979	0.03437	86.371	0.07424	0.00551	0.03963
V_29240	mg/L	0.00087	0.00152	174.87	0.00029	-0.00028	0.00259
Zn2062	mg/L	0.00242	0.00045	18.42	0.00208	0.00225	0.00293
Zn2138	mg/L	0.00258	0.00021	8.1366	0.00263	0.00276	0.00235
Zn3345	mg/L	0.01491	0.0026	17.456	0.01772	0.01443	0.01258

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=SRM-118169
Username=Ron Hunt
Comment=ICP-6010-S-T
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 15:52:43

Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	58.641	0.40413	0.68917	58.231	58.652	59.039
Ca3181	mg/L	58.634	0.39772	0.67831	58.228	58.651	59.023
Mg2790	mg/L	118.64	0.86804	0.73164	117.74	118.73	119.47
Mg2852	mg/L	113.91	0.67084	0.58893	113.22	114.56	113.95
K_7664	mg/L	56.535	0.18081	0.31981	56.729	56.506	56.371
K_7698	mg/L	56.714	0.22289	0.39301	56.953	56.676	56.512
Na5895	mg/L	88.65	0.5661	0.6385	89.12	88.82	88.03
Na8183	mg/L	87.783	0.15154	0.17263	87.608	87.874	87.866
Ag3280	mg/L	1.5149	0.00449	0.29637	1.51	1.5187	1.5161
Al1670	mg/L	84.059	0.1676	0.19938	83.982	84.251	83.943
Al3961	mg/L	173.99	0.71839	0.41288	174.49	174.32	173.17
As1890	mg/L	2.357	0.002	0.08498	2.3555	2.3593	2.3562
As1937	mg/L	2.3737	0.0116	0.48851	2.3691	2.3869	2.365
Au2427	mg/L	-0.03693	0.00263	7.1231	-0.03867	-0.03822	-0.0339
Au2675	mg/L	0.01095	0.00276	25.195	0.00935	0.00936	0.01413
B_2089	mg/L	2.6002	0.00268	0.10322	2.6021	2.6015	2.5972
B_2497	mg/L	2.5991	0.01048	0.40316	2.587	2.6058	2.6045
Ba4554	mg/L	4.5965	0.03109	0.67629	4.6048	4.6226	4.5621
Ba2347	mg/L	4.3835	0.07671	1.7499	4.3323	4.3466	4.4717
Be3130	mg/L	i 3.5932	0.0311	0.86543	i 3.5575	i 3.6145	i 3.6077
Be3131	mg/L	i 3.6141	0.0367	1.0155	i 3.5718	i 3.6375	i 3.6329
Cd2144	mg/L	4.0535	0.00513	0.12653	4.0495	4.0518	4.0593
Cd2288	mg/L	4.2055	0.00041	0.00965	4.2054	4.2052	4.206
Co2286	mg/L	1.1057	0.00054	0.0485	1.1057	1.1051	1.1062
Co2388	mg/L	1.1166	0.0078	0.69875	1.108	1.1184	1.1233
Cr2055	mg/L	3.3104	0.00513	0.15508	3.3045	3.3127	3.314
Cr2666	mg/L	3.2949	0.042	1.2746	3.2515	3.298	3.3353
Cr2677	mg/L	3.3064	0.02003	0.60584	3.2849	3.3098	3.3245

Cu2199	mg/L	1.1762	0.00683	0.58082	1.1805	1.1683	1.1798
Cu3247	mg/L	1.4018	0.00274	0.19582	1.4038	1.4029	1.3986
Cu3273	mg/L	1.3794	0.00143	0.10368	1.3786	1.3786	1.3811
Fe2599	mg/L	77.711	0.38408	0.49424	77.301	77.77	78.063
Fe2714	mg/L	79.486	0.43929	0.55267	79.061	79.459	79.939
Hg1849	mg/L	0.0829	0.0017	2.0537	0.08109	0.08312	0.08448
Hg1942	mg/L	0.07766	0.0016	2.0588	0.07739	0.07621	0.07938
Li6707	mg/L	1.8535	0.01074	0.57927	1.8629	1.8559	1.8418
Mn2576	mg/L	7.3798	0.03276	0.44386	7.3469	7.3801	7.4124
Mn2593	mg/L	7.3859	0.04147	0.56143	7.3417	7.3923	7.4239
Mn4033	mg/L	7.7545	0.03246	0.41858	7.7837	7.7603	7.7195
Mo2020	mg/L	1.0479	0.00179	0.17107	1.0494	1.0484	1.046
Mo2816	mg/L	0.39827	0.01096	2.7516	0.39525	0.38915	0.41043
Ni2216	mg/L	2.5652	0.00251	0.09773	2.5644	2.568	2.5632
Ni2303	mg/L	2.5325	0.004	0.15798	2.5307	2.5297	2.5371
Ni2316	mg/L	2.5423	0.00462	0.18153	2.5372	2.5463	2.5434
P_1774	mg/L	7.4255	0.01344	0.18097	7.4408	7.4201	7.4156
P_2149	mg/L	7.4787	0.01106	0.1479	7.4726	7.4915	7.472
Pb2169	mg/L	2.675	0.0403	1.505	2.664	2.72	2.642
Pb2203	mg/L	2.7056	0.00945	0.34938	2.7013	2.7165	2.6992
Sb2068	mg/L	0.31309	0.00526	1.6792	0.30967	0.31046	0.31915
Sb2175	mg/L	0.31716	0.01054	3.3235	0.32768	0.31721	0.3066
Se1960	mg/L	0.81595	0.00654	0.80125	0.81091	0.81361	0.82334
Se2039	mg/L	0.76268	0.01668	2.1872	0.7815	0.75682	0.74972
Si2516	mg/L	4.0514	0.0089	0.2197	4.0557	4.0412	4.0574
Si2881	mg/L	4.0547	0.02983	0.7357	4.0535	4.0255	4.0851
Sn1899	mg/L	2.2195	0.00515	0.23191	2.2254	2.217	2.2161
Sr3464	mg/L	6.3408	0.04348	0.68577	6.3006	6.3347	6.387
Sr4077	mg/L	6.4404	0.03714	0.57662	6.4015	6.4755	6.4441
Te2142	mg/L	0.02367	0.00692	29.244	0.02415	0.01652	0.03034
Ti3349	mg/L	2.1813	0.00803	0.36802	2.1721	2.1864	2.1855
Ti3361	mg/L	2.1956	0.00678	0.30867	2.1901	2.2032	2.1936
Tl1908	mg/L	0.96018	0.01189	1.2386	0.97129	0.94763	0.96162
U_3670	mg/L	0.02436	0.03092	126.95	0.03829	-0.01108	0.04586
U_3859	mg/L	0.05284	0.0228	43.137	0.04771	0.03305	0.07777

V_29240	mg/L	1.3761	0.00589	0.42816	1.371	1.3748	1.3825
Zn2062	mg/L	13.58	0.01914	0.14095	13.562	13.579	13.6
Zn2138	mg/L	14.05	0.00632	0.04495	14.047	14.057	14.045
Zn3345	mg/L	13.415	0.1427	1.0638	13.261	13.442	13.542

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=B18020067-001B
Username=Ron Hunt
Comment=6010.20-S
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 15:56:57
Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	19.615	0.14061	0.71685	19.468	19.63	19.748
Ca3181	mg/L	19.659	0.13163	0.66954	19.563	19.606	19.809
Mg2790	mg/L	16.309	0.13547	0.83065	16.179	16.298	16.45
Mg2852	mg/L	16.724	0.03973	0.23758	16.707	16.695	16.769
K_7664	mg/L	10.035	0.05691	0.56715	10.1	10.012	9.9934
K_7698	mg/L	10.193	0.0073	0.07162	10.2	10.195	10.186
Na5895	mg/L	1.117	0.012	1.077	1.129	1.118	1.105
Na8183	mg/L	0.77819	0.04075	5.2367	0.73944	0.82068	0.77443
Ag3280	mg/L	0.00032	0.00107	331.59	0.0014	0.00033	-0.00075
Al1670	mg/L	48.348	0.17362	0.35911	48.384	48.159	48.5
Al3961	mg/L	64.934	0.19913	0.30667	64.881	64.766	65.154

As1890	mg/L	0.02115	0.005	23.628	0.02592	0.01595	0.02157
As1937	mg/L	0.03664	0.00479	13.08	0.03263	0.03534	0.04195
Au2427	mg/L	-0.00714	0.00372	52.123	-0.00792	-0.01042	-0.00309
Au2675	mg/L	0.01073	0.00631	58.827	0.0035	0.01515	0.01353
B_2089	mg/L	0.03386	0.00074	2.1838	0.03469	0.03328	0.0336
B_2497	mg/L	0.01985	0.00083	4.1864	0.01993	0.01899	0.02064
Ba4554	mg/L	0.9177	0.00228	0.24799	0.91687	0.91596	0.92028
Ba2347	mg/L	0.85877	0.02979	3.4693	0.84337	0.83983	0.89311
Be3130	mg/L	i .00547	0.00012	2.136	i .00555	i .00553	i .00534
Be3131	mg/L	i .00513	0.00012	2.3776	i .00521	i .00518	i .00499
Cd2144	mg/L	-0.00341	0.00008	2.2256	-0.00341	-0.00334	-0.00349
Cd2288	mg/L	0.00049	0.00045	92.557	0.00082	-0.00003	0.00068
Co2286	mg/L	0.03212	0.00052	1.6195	0.03155	0.03257	0.03224
Co2388	mg/L	0.05637	0.00249	4.422	0.05581	0.0591	0.05421
Cr2055	mg/L	0.02698	0.00022	0.82471	0.0271	0.02712	0.02673
Cr2666	mg/L	0.05217	0.00431	8.2675	0.05677	0.05153	0.04822
Cr2677	mg/L	0.05113	0.00094	1.8334	0.05215	0.0503	0.05096
Cu2199	mg/L	-0.00006	0.00148	2433.6	-0.00056	0.0016	-0.00122
Cu3247	mg/L	0.02768	0.00068	2.4566	0.02714	0.02746	0.02844
Cu3273	mg/L	0.0231	0.00229	9.9078	0.02324	0.02075	0.02532
Fe2599	mg/L	93.279	0.48211	0.51685	92.827	93.225	93.786
Fe2714	mg/L	95.908	0.75822	0.79057	95.21	95.799	96.715
Hg1849	mg/L	0.00153	0.00106	69.164	0.00122	0.00271	0.00066
Hg1942	mg/L	-0.00103	0.00271	262.83	-0.00061	-0.00392	0.00144
Li6707	mg/L	0.05178	0.00062	1.2043	0.05191	0.05234	0.05111
Mn2576	mg/L	0.95627	0.00298	0.31182	0.95385	0.95537	0.9596
Mn2593	mg/L	0.96526	0.00394	0.40852	0.96191	0.96427	0.96961
Mn4033	mg/L	0.92213	0.01364	1.4797	0.90689	0.92625	0.93323
Mo2020	mg/L	0.00298	0.00109	36.55	0.00421	0.00255	0.00216
Mo2816	mg/L	-0.42802	0.00605	1.4134	-0.43192	-0.42105	-0.43108
Ni2216	mg/L	0.05102	0.00048	0.93347	0.05123	0.05047	0.05135
Ni2303	mg/L	0.0555	0.00225	4.062	0.05326	0.05548	0.05777
Ni2316	mg/L	0.05064	0.00098	1.9281	0.04952	0.05129	0.05112
P_1774	mg/L	1.4277	0.01609	1.1271	1.4121	1.4267	1.4442
P_2149	mg/L	1.4992	0.01575	1.0509	1.5137	1.4824	1.5013

Pb2169	mg/L	-0.0236	0.012	51.03	-0.0115	-0.0356	-0.0236
Pb2203	mg/L	0.07863	0.00728	9.2631	0.08272	0.07022	0.08295
Sb2068	mg/L	0.00385	0.00417	108.51	0.00719	-0.00083	0.00518
Sb2175	mg/L	-0.02528	0.00399	15.773	-0.025	-0.02143	-0.02939
Se1960	mg/L	0.00857	0.01167	136.16	0.02196	0.00322	0.00054
Se2039	mg/L	-0.00915	0.01015	110.92	-0.01171	-0.01778	0.00203
Si2516	mg/L	2.4729	0.0181	0.73207	2.4932	2.4585	2.4669
Si2881	mg/L	2.4459	0.02203	0.90087	2.4513	2.4217	2.4648
Sn1899	mg/L	0.01847	0.00309	16.704	0.01501	0.01948	0.02093
Sr3464	mg/L	0.22974	0.00251	1.0905	0.22697	0.23038	0.23186
Sr4077	mg/L	0.24357	0.00039	0.16008	0.24363	0.24315	0.24393
Te2142	mg/L	0.0202	0.00593	29.373	0.02358	0.01335	0.02368
Ti3349	mg/L	0.75692	0.00393	0.51944	0.75286	0.7572	0.7607
Ti3361	mg/L	0.76329	0.00087	0.11383	0.76394	0.76231	0.76364
Tl1908	mg/L	-0.00665	0.00389	58.495	-0.00806	-0.00964	-0.00225
U_3670	mg/L	-0.06392	0.01797	28.116	-0.06134	-0.08304	-0.04738
U_3859	mg/L	0.01185	0.0085	71.693	0.0025	0.01396	0.01909
V_29240	mg/L	0.13041	0.00026	0.19687	0.13032	0.13069	0.13021
Zn2062	mg/L	0.18417	0.00074	0.40281	0.18353	0.184	0.18498
Zn2138	mg/L	0.18577	0.00078	0.42241	0.1849	0.18643	0.18597
Zn3345	mg/L	-0.62904	0.02944	4.6794	-0.61235	-0.61174	-0.66302

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=B18020067-002B
Username=Ron Hunt
Comment=6010.20-S
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 16:00:39
Sample Type=Unk

Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	45.727	0.32858	0.71858	45.407	45.709	46.064
Ca3181	mg/L	45.8	0.39519	0.86285	45.365	45.9	46.136
Mg2790	mg/L	13.571	0.10226	0.75348	13.475	13.559	13.679
Mg2852	mg/L	14.108	0.02076	0.14716	14.084	14.116	14.122
K_7664	mg/L	6.4663	0.02573	0.39785	6.4891	6.4714	6.4384
K_7698	mg/L	6.6622	0.0125	0.18758	6.6723	6.6482	6.6662
Na5895	mg/L	2.246	0.0157	0.697	2.256	2.256	2.228
Na8183	mg/L	1.9271	0.03985	2.0678	1.8816	1.9439	1.9559
Ag3280	mg/L	-0.00016	0.00193	1203.7	-0.00235	0.00058	0.00129
Al1670	mg/L	31.21	0.05707	0.18287	31.149	31.262	31.219
Al3961	mg/L	37.584	0.07277	0.19361	37.523	37.664	37.565
As1890	mg/L	0.02748	0.0095	34.553	0.01738	0.03622	0.02885
As1937	mg/L	0.02133	0.00611	28.626	0.01452	0.0263	0.02317
Au2427	mg/L	-0.0088	0.00135	15.341	-0.00767	-0.00844	-0.0103
Au2675	mg/L	0.01019	0.00381	37.348	0.01456	0.00757	0.00845
B_2089	mg/L	0.03151	0.00125	3.9637	0.03118	0.03289	0.03046
B_2497	mg/L	0.01892	0.00138	7.2749	0.01985	0.01958	0.01734
Ba4554	mg/L	1.8887	0.01237	0.65483	1.878	1.8859	1.9023
Ba2347	mg/L	1.7927	0.01143	0.63741	1.7796	1.798	1.8006
Be3130	mg/L	i .00364	0.00008	2.1922	i .00358	i .00373	i .00360
Be3131	mg/L	i .00321	0.00002	0.65648	i .00323	i .00319	i .00322
Cd2144	mg/L	-0.00219	0.00019	8.8213	-0.0024	-0.00202	-0.00214
Cd2288	mg/L	0.00021	0.00034	164.77	-0.00018	0.00046	0.00034
Co2286	mg/L	0.03347	0.00049	1.4758	0.03322	0.03404	0.03316
Co2388	mg/L	0.0617	0.00115	1.8614	0.06284	0.06054	0.06172
Cr2055	mg/L	0.00887	0.0011	12.374	0.00939	0.00761	0.00961
Cr2666	mg/L	0.03349	0.00661	19.735	0.03287	0.02722	0.04039
Cr2677	mg/L	0.0344	0.00114	3.3188	0.03391	0.03571	0.03359
Cu2199	mg/L	0.00852	0.0061	71.641	0.00948	0.00199	0.01409

Cu3247	mg/L	0.02829	0.00091	3.2113	0.02915	0.02838	0.02734
Cu3273	mg/L	0.0214	0.0013	6.0716	0.02276	0.02126	0.02017
Fe2599	mg/L	108.4	0.46815	0.43188	107.96	108.34	108.89
Fe2714	mg/L	110.97	0.63332	0.57073	110.27	111.12	111.51
Hg1849	mg/L	0.00103	0.00069	66.705	0.00171	0.00104	0.00034
Hg1942	mg/L	-0.00152	0.00094	61.703	-0.00044	-0.00201	-0.00211
Li6707	mg/L	0.04994	0.00026	0.51895	0.05022	0.04989	0.0497
Mn2576	mg/L	1.2152	0.00293	0.24087	1.2118	1.2169	1.217
Mn2593	mg/L	1.2073	0.00431	0.35707	1.2029	1.2076	1.2115
Mn4033	mg/L	1.179	0.01975	1.6749	1.1938	1.1867	1.1566
Mo2020	mg/L	0.0044	0.00029	6.6827	0.0045	0.00407	0.00463
Mo2816	mg/L	-0.27795	0.00149	0.53696	-0.27631	-0.27831	-0.27922
Ni2216	mg/L	0.03655	0.00146	3.9903	0.0349	0.03768	0.03705
Ni2303	mg/L	0.04309	0.00279	6.475	0.04552	0.04004	0.04372
Ni2316	mg/L	0.03787	0.00091	2.4039	0.03765	0.03887	0.03709
P_1774	mg/L	4.0195	0.02249	0.55955	4.0131	4.0009	4.0445
P_2149	mg/L	4.058	0.02555	0.62957	4.0787	4.0294	4.0658
Pb2169	mg/L	-0.0118	0.0208	175.9	-0.034	-0.0086	0.0072
Pb2203	mg/L	0.07485	0.00472	6.3028	0.07242	0.08028	0.07183
Sb2068	mg/L	-0.00302	0.0023	76.072	-0.00048	-0.00495	-0.00362
Sb2175	mg/L	-0.01371	0.00563	41.06	-0.01327	-0.00832	-0.01955
Se1960	mg/L	0.0082	0.00851	103.85	-0.00107	0.00998	0.01567
Se2039	mg/L	0.01337	0.01531	114.53	0.02141	-0.00429	0.02298
Si2516	mg/L	2.7596	0.01797	0.65128	2.7484	2.7501	2.7803
Si2881	mg/L	2.7806	0.0131	0.47112	2.7704	2.7759	2.7954
Sn1899	mg/L	0.0215	0.00073	3.4116	0.02065	0.02194	0.0219
Sr3464	mg/L	0.28875	0.00533	1.845	0.28331	0.28898	0.29396
Sr4077	mg/L	0.31119	0.00035	0.1123	0.31143	0.31135	0.31078
Te2142	mg/L	0.02403	0.00234	9.7428	0.02597	0.02143	0.02468
Ti3349	mg/L	1.3335	0.00478	0.3583	1.328	1.3364	1.3362
Ti3361	mg/L	1.3424	0.00326	0.24269	1.34	1.3409	1.3461
Tl1908	mg/L	-0.01725	0.00186	10.762	-0.01635	-0.01938	-0.01601
U_3670	mg/L	-0.08471	0.01676	19.785	-0.08128	-0.06993	-0.10292
U_3859	mg/L	0.01353	0.0266	196.64	-0.01719	0.02884	0.02892
V_29240	mg/L	0.13247	0.00184	1.3894	0.13162	0.13121	0.13458

Zn2062	mg/L	0.19594	0.00069	0.35118	0.19531	0.19583	0.19667
Zn2138	mg/L	0.20064	0.0006	0.3014	0.20131	0.20047	0.20014
Zn3345	mg/L	-0.81363	0.02693	3.3099	-0.82849	-0.82985	-0.78254

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCV
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 16:25:23
Sample Type=QC
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	26.356	0.13559	0.51445	26.438	26.43	26.2	Chk Pass		
Ca3181	mg/L	26.607	0.03226	0.12126	26.644	26.592	26.585	Chk Pass		
Mg2790	mg/L	26.008	0.12042	0.46301	26.059	26.095	25.871	Chk Pass		
Mg2852	mg/L	26.083	0.13957	0.5351	26.232	26.06	25.956	Chk Pass		
K_7664	mg/L	25.882	0.21285	0.82242	26.127	25.76	25.757	Chk Pass		
K_7698	mg/L	26.074	0.24006	0.92068	26.351	25.942	25.93	Chk Pass		
Na5895	mg/L	25.95	0.2598	1.001	26.25	25.78	25.82	Chk Pass		
Na8183	mg/L	25.998	0.08191	0.31505	26.06	25.905	26.029	Chk Pass		
Ag3280	mg/L	1.011	0.00723	0.71528	1.0158	1.0145	1.0026	Chk Pass		
Al1670	mg/L	2.5691	0.01902	0.7402	2.5721	2.5487	2.5864	Chk Pass		
Al3961	mg/L	2.5557	0.01443	0.56443	2.572	2.5445	2.5507	Chk Pass		
As1890	mg/L	2.5963	0.01129	0.4347	2.6066	2.5842	2.5982	Chk Pass		

As1937	mg/L	2.572	0.01631	0.63405	2.5872	2.5548	2.5739	Chk Pass
Au2427	mg/L	2.4936	0.00886	0.35511	2.4971	2.4835	2.5002	Chk Pass
Au2675	mg/L	2.4935	0.01405	0.56343	2.4811	2.4905	2.5088	Chk Pass
B_2089	mg/L	2.5352	0.00946	0.37319	2.5447	2.5352	2.5258	Chk Pass
B_2497	mg/L	2.5667	0.01114	0.43419	2.573	2.5733	2.5538	Chk Pass
Ba4554	mg/L	2.5645	0.01062	0.41409	2.5643	2.5539	2.5752	Chk Pass
Ba2347	mg/L	2.5142	0.0144	0.57284	2.5089	2.5305	2.5032	Chk Pass
Be3130	mg/L	i 1.2890	0.0053	0.41087	i 1.2940	i 1.2894	i 1.2835	Chk Pass
Be3131	mg/L	i 1.2814	0.00562	0.43825	i 1.2866	i 1.2822	i 1.2755	Chk Pass
Cd2144	mg/L	2.4988	0.00391	0.15659	2.5029	2.4983	2.4951	Chk Pass
Cd2288	mg/L	2.5148	0.0074	0.29408	2.5221	2.5149	2.5074	Chk Pass
Co2286	mg/L	2.5017	0.00463	0.18495	2.5069	2.4981	2.5001	Chk Pass
Co2388	mg/L	2.5028	0.00745	0.2975	2.511	2.4965	2.501	Chk Pass
Cr2055	mg/L	2.5347	0.00619	0.24419	2.5419	2.5312	2.5311	Chk Pass
Cr2666	mg/L	2.5315	0.0119	0.47021	2.5367	2.5398	2.5179	Chk Pass
Cr2677	mg/L	2.5189	0.00438	0.17377	2.5198	2.5228	2.5142	Chk Pass
Cu2199	mg/L	2.334	0.00597	0.25562	2.3408	2.3299	2.3313	Chk Pass
Cu3247	mg/L	2.5004	0.01059	0.42366	2.5118	2.4986	2.4909	Chk Pass
Cu3273	mg/L	2.4572	0.0143	0.58188	2.4734	2.4462	2.4522	Chk Pass
Fe2599	mg/L	2.6939	0.02634	0.97793	2.7188	2.6965	2.6663	Chk Pass
Fe2714	mg/L	2.6371	0.02818	1.0685	2.6355	2.6097	2.666	Chk Pass
Hg1849	mg/L	1.0225	0.00336	0.32825	1.0246	1.0241	1.0186	Chk Pass
Hg1942	mg/L	1.0422	0.0044	0.42177	1.0464	1.0376	1.0427	Chk Pass
Li6707	mg/L	1.2925	0.01238	0.95794	1.3067	1.2835	1.2874	Chk Pass
Mn2576	mg/L	2.5403	0.01184	0.46609	2.5504	2.5433	2.5273	Chk Pass
Mn2593	mg/L	2.5231	0.00756	0.2998	2.5298	2.5247	2.5149	Chk Pass
Mn4033	mg/L	2.5118	0.03818	1.52	2.5554	2.4841	2.496	Chk Pass
Mo2020	mg/L	2.5576	0.00824	0.32215	2.5671	2.5525	2.5531	Chk Pass
Mo2816	mg/L	2.5257	0.00932	0.36905	2.535	2.5257	2.5164	Chk Pass
Ni2216	mg/L	2.4874	0.00665	0.26737	2.4937	2.4881	2.4804	Chk Pass
Ni2303	mg/L	2.4805	0.00397	0.16015	2.485	2.4788	2.4776	Chk Pass
Ni2316	mg/L	2.4798	0.00763	0.30785	2.4877	2.4792	2.4725	Chk Pass
P_1774	mg/L	2.5812	0.01019	0.39491	2.5857	2.5696	2.5884	Chk Pass
P_2149	mg/L	2.5417	0.01938	0.76234	2.5635	2.5351	2.5265	Chk Pass
Pb2169	mg/L	2.507	0.0108	0.4299	2.52	2.5	2.502	Chk Pass

Pb2203	mg/L	2.5098	0.00578	0.2303	2.5163	2.5054	2.5076	Chk Pass
Sb2068	mg/L	2.5744	0.00334	0.12982	2.5778	2.5745	2.5711	Chk Pass
Sb2175	mg/L	2.5477	0.0118	0.4631	2.5551	2.554	2.5341	Chk Pass
Se1960	mg/L	2.5321	0.00478	0.18882	2.5365	2.527	2.5327	Chk Pass
Se2039	mg/L	2.4975	0.02573	1.0304	2.5272	2.4826	2.4826	Chk Pass
Si2516	mg/L	5.162	0.02053	0.39781	5.1838	5.1594	5.143	Chk Pass
Si2881	mg/L	5.2072	0.01868	0.3587	5.2085	5.2252	5.1879	Chk Pass
Sn1899	mg/L	2.531	0.00596	0.23538	2.535	2.5241	2.5337	Chk Pass
Sr3464	mg/L	2.5426	0.00682	0.26835	2.5405	2.5502	2.537	Chk Pass
Sr4077	mg/L	2.5114	0.01516	0.60351	2.524	2.5157	2.4946	Chk Pass
Te2142	mg/L	2.5168	0.00708	0.28147	2.5225	2.5191	2.5089	Chk Pass
Ti3349	mg/L	2.5423	0.01174	0.46173	2.5538	2.5429	2.5303	Chk Pass
Ti3361	mg/L	2.5578	0.00989	0.38664	2.5677	2.5578	2.5479	Chk Pass
Tl1908	mg/L	2.4908	0.00117	0.04701	2.4916	2.4913	2.4895	Chk Pass
U_3670	mg/L	2.5416	0.03028	1.1913	2.5737	2.5136	2.5375	Chk Pass
U_3859	mg/L	2.598	0.02981	1.1475	2.5807	2.6324	2.5808	Chk Pass
V_29240	mg/L	2.587	0.00998	0.3857	2.5936	2.5919	2.5755	Chk Pass
Zn2062	mg/L	2.5005	0.00244	0.09748	2.5032	2.4997	2.4986	Chk Pass
Zn2138	mg/L	2.5282	0.0073	0.2888	2.5361	2.5267	2.5217	Chk Pass
Zn3345	mg/L	2.5358	0.02289	0.90251	2.5606	2.5314	2.5155	Chk Pass

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCB
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 16:29:06
Sample Type=QC
Mode=CONC

CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	0.00581	0.00165	28.322	0.00744	0.00584	0.00415	Chk Pass		
Ca3181	mg/L	0.02832	0.01202	42.439	0.03659	0.01453	0.03385	Chk Pass		
Mg2790	mg/L	0.01058	0.01202	113.52	0.01449	0.02016	-0.0029	Chk Pass		
Mg2852	mg/L	0.00473	0.00156	32.952	0.00649	0.0042	0.00351	Chk Pass		
K_7664	mg/L	0.00734	0.00941	128.23	0.01278	-0.00353	0.01276	Chk Pass		
K_7698	mg/L	-0.0315	0.03185	101.1	0.00141	-0.06216	-0.03375	Chk Pass		
Na5895	mg/L	0.0695	0.0018	2.661	0.0698	0.0675	0.0712	Chk Pass		
Na8183	mg/L	-0.12116	0.06603	54.5	-0.10342	-0.19424	-0.06581	Chk Pass		
Ag3280	mg/L	-0.00163	0.00071	43.743	-0.00162	-0.00235	-0.00092	None		
Al1670	mg/L	0.00102	0.00073	71.73	0.00019	0.00131	0.00157	None		
Al3961	mg/L	-0.00252	0.00336	133.48	-0.00314	0.00111	-0.00551	Chk Pass		
As1890	mg/L	0.0031	0.00647	208.74	-0.00205	0.01035	0.00099	None		
As1937	mg/L	-0.00173	0.00344	199.28	-0.00523	0.00165	-0.0016	None		
Au2427	mg/L	0.00379	0.00028	7.3126	0.0041	0.00359	0.00367	None		
Au2675	mg/L	0.01409	0.00087	6.1566	0.01312	0.01479	0.01435	None		
B_2089	mg/L	0.00081	0.00038	46.746	0.00088	0.0004	0.00115	Chk Pass		
B_2497	mg/L	0.00348	0.00151	43.335	0.00522	0.00269	0.00252	Chk Pass		
Ba4554	mg/L	0.00045	0.00004	8.9058	0.00049	0.00041	0.00046	None		
Ba2347	mg/L	-0.02024	0.02926	144.58	0.01351	-0.03843	-0.03579	None		
Be3130	mg/L	i .00015	0.00002	16.214	i .00018	i .00014	i .00014	None		
Be3131	mg/L	i -.00010	0.00003	28.481	i -.00012	i -.00012	i -.00007	None		
Cd2144	mg/L	0.00027	0.0003	112.88	0.00005	0.00014	0.00061	None		
Cd2288	mg/L	0.00052	0.00017	31.768	0.00054	0.00035	0.00068	None		
Co2286	mg/L	0.00073	0.00017	22.734	0.00092	0.00062	0.00065	None		
Co2388	mg/L	-0.00062	0.00184	297.6	-0.00095	-0.00227	0.00137	None		
Cr2055	mg/L	0.00043	0.00047	109.43	0.00087	-0.00006	0.00046	None		
Cr2666	mg/L	0.00334	0.00502	149.96	-0.00245	0.00635	0.00612	None		
Cr2677	mg/L	0.00205	0.00026	12.523	0.00185	0.00234	0.00197	None		
Cu2199	mg/L	0.00287	0.00187	64.973	0.00093	0.00465	0.00304	None		
Cu3247	mg/L	-0.00006	0.00124	1919.6	-0.00024	0.00125	-0.00121	None		

Cu3273	mg/L	-0.00265	0.00423	159.92	0.00223	-0.00534	-0.00483	None
Fe2599	mg/L	-0.00034	0.00145	427.97	0.001	-0.00013	-0.00187	Chk Pass
Fe2714	mg/L	-0.02209	0.02933	132.77	0.01043	-0.04654	-0.03017	Chk Pass
Hg1849	mg/L	-0.00139	0.00156	112.49	0.0004	-0.00208	-0.00248	None
Hg1942	mg/L	0.00038	0.00301	787.8	-0.00271	0.00055	0.00331	None
Li6707	mg/L	-0.00059	0.00048	81.654	-0.00046	-0.00018	-0.00111	None
Mn2576	mg/L	0.00002	0.00005	235.23	0.00008	-0.00001	0	None
Mn2593	mg/L	0.00042	0.00021	50.206	0.00034	0.00026	0.00066	None
Mn4033	mg/L	-0.02984	0.00479	16.065	-0.03258	-0.03262	-0.0243	None
Mo2020	mg/L	0.00029	0.0003	102.99	0.00026	0.00061	0.00001	None
Mo2816	mg/L	0.00454	0.00161	35.58	0.00597	0.00486	0.00279	None
Ni2216	mg/L	0.00057	0.00019	32.525	0.00055	0.0004	0.00076	None
Ni2303	mg/L	0.00287	0.00196	68.083	0.00281	0.00095	0.00486	None
Ni2316	mg/L	0.00075	0.00085	112.89	0.00146	-0.00019	0.00099	None
P_1774	mg/L	0.00228	0.00232	101.7	0.00417	-0.00031	0.003	None
P_2149	mg/L	0.00056	0.00562	1008.4	0.00705	-0.00248	-0.00289	None
Pb2169	mg/L	-0.0181	0.0254	140.3	-0.0334	-0.0321	0.0112	None
Pb2203	mg/L	-0.00277	0.00442	159.65	-0.00751	-0.00202	0.00123	None
Sb2068	mg/L	-0.00593	0.00663	111.96	0.0017	-0.01038	-0.0091	None
Sb2175	mg/L	0.00041	0.00797	1927.7	-0.00731	0.00861	-0.00006	None
Se1960	mg/L	0.01527	0.00279	18.248	0.01694	0.01206	0.01683	None
Se2039	mg/L	0.00991	0.03009	303.65	0.02972	-0.02472	0.02473	None
Si2516	mg/L	0.00248	0.00543	219.05	-0.00134	0.00008	0.0087	None
Si2881	mg/L	0.00119	0.00753	632.67	0.00704	0.00383	-0.0073	None
Sn1899	mg/L	-0.00258	0.00118	45.848	-0.00365	-0.00131	-0.00278	None
Sr3464	mg/L	0.00066	0.00046	69.633	0.00019	0.00111	0.00069	None
Sr4077	mg/L	0.00043	0.00006	14.603	0.0005	0.00042	0.00038	None
Te2142	mg/L	0.01523	0.00523	34.322	0.0103	0.01469	0.02071	None
Ti3349	mg/L	0.00059	0.00052	89.021	0.00087	0.00091	-0.00002	None
Ti3361	mg/L	0.00064	0.00026	41.23	0.00059	0.0004	0.00092	None
Tl1908	mg/L	0.00122	0.0039	318.74	-0.00039	0.00568	-0.00161	None
U_3670	mg/L	-0.03232	0.03061	94.69	-0.06655	-0.02287	-0.00756	None
U_3859	mg/L	0.04369	0.01293	29.589	0.03381	0.05833	0.03894	None
V_29240	mg/L	0.0007	0.00108	154.81	-0.00031	0.00056	0.00184	None
Zn2062	mg/L	0.00047	0.00021	44.72	0.00024	0.00054	0.00064	None

Zn2138	mg/L	0.00063	0.00027	43.138	0.0007	0.00033	0.00086	Chk Pass
Zn3345	mg/L	0.01416	0.01683	118.79	-0.00526	0.02393	0.02383	None

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=B18020068-014B
Username=Ron Hunt
Comment=6010.20-S
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 17:07:59
Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	237.39	2.7484	1.1578	234.49	237.72	239.95
Ca3181	mg/L	251.02	1.9124	0.76188	249.37	250.57	253.11
Mg2790	mg/L	13.177	0.09995	0.75857	13.113	13.125	13.292
Mg2852	mg/L	14.333	0.05198	0.36264	14.274	14.37	14.356
K_7664	mg/L	5.691	0.04594	0.80722	5.6794	5.7416	5.6519
K_7698	mg/L	6.2879	0.05489	0.8729	6.2586	6.3512	6.2538
Na5895	mg/L	1.52	0.0086	0.5687	1.518	1.53	1.513
Na8183	mg/L	0.92758	0.09563	10.31	0.82264	0.95029	1.0098
Ag3280	mg/L	-0.00038	0.00085	223.96	-0.00125	0.00044	-0.00032
Al1670	mg/L	28.498	0.12893	0.45241	28.496	28.37	28.628
Al3961	mg/L	33.899	0.11952	0.35256	33.783	34.022	33.892
As1890	mg/L	0.04663	0.00624	13.372	0.03976	0.04819	0.05194
As1937	mg/L	0.0446	0.00404	9.0623	0.04659	0.04726	0.03995

Au2427	mg/L	-0.02688	0.00351	13.048	-0.024	-0.02585	-0.03078
Au2675	mg/L	0.01227	0.00345	28.097	0.00829	0.01421	0.01431
B_2089	mg/L	0.02856	0.00104	3.6373	0.0289	0.0274	0.02939
B_2497	mg/L	0.02438	0.00094	3.8539	0.02375	0.02546	0.02393
Ba4554	mg/L	1.344	0.00486	0.36181	1.3414	1.3496	1.3409
Ba2347	mg/L	1.2759	0.01208	0.94642	1.2697	1.2898	1.2682
Be3130	mg/L	i .00310	0.00003	0.97235	i .00314	i .00309	i .00308
Be3131	mg/L	i .00242	0.00002	0.67127	i .00244	i .00241	i .00242
Cd2144	mg/L	-0.00141	0.00024	17.189	-0.00169	-0.00124	-0.00131
Cd2288	mg/L	0.00116	0.00011	9.4748	0.00119	0.00126	0.00104
Co2286	mg/L	0.02769	0.00155	5.5819	0.0294	0.02638	0.0273
Co2388	mg/L	0.05772	0.00253	4.3772	0.06038	0.05742	0.05536
Cr2055	mg/L	0.01418	0.0008	5.6444	0.01333	0.01491	0.01431
Cr2666	mg/L	0.03034	0.00566	18.665	0.0348	0.02397	0.03225
Cr2677	mg/L	0.02982	0.00068	2.2675	0.0302	0.02904	0.03023
Cu2199	mg/L	0.01392	0.0045	32.311	0.01054	0.0122	0.01902
Cu3247	mg/L	0.03129	0.00144	4.6062	0.03186	0.02965	0.03236
Cu3273	mg/L	0.02305	0.00021	0.9013	0.02295	0.02329	0.02292
Fe2599	mg/L	89.485	0.5754	0.64302	88.897	89.511	90.047
Fe2714	mg/L	84.632	0.63307	0.74803	84.152	84.395	85.349
Hg1849	mg/L	0.0004	0.00095	234.87	0.00083	0.00106	-0.00068
Hg1942	mg/L	-0.00344	0.00214	62.393	-0.00319	-0.00569	-0.00143
Li6707	mg/L	0.04995	0.00032	0.63913	0.04971	0.05031	0.04982
Mn2576	mg/L	3.0421	0.01713	0.56302	3.0244	3.0433	3.0586
Mn2593	mg/L	2.8776	0.01716	0.59648	2.8606	2.8774	2.8949
Mn4033	mg/L	3.0443	0.01748	0.57418	3.0254	3.0599	3.0477
Mo2020	mg/L	0.01727	0.00102	5.9021	0.01838	0.01706	0.01638
Mo2816	mg/L	-0.24245	0.0028	1.1568	-0.24109	-0.24058	-0.24567
Ni2216	mg/L	0.03938	0.00057	1.4442	0.0396	0.03874	0.03981
Ni2303	mg/L	0.03877	0.00113	2.9222	0.03953	0.03747	0.03931
Ni2316	mg/L	0.04391	0.00124	2.8223	0.04467	0.04248	0.04459
P_1774	mg/L	3.4187	0.00966	0.28249	3.4246	3.4076	3.4239
P_2149	mg/L	3.2386	0.02066	0.63787	3.2161	3.2567	3.243
Pb2169	mg/L	-0.0161	0.0277	172.1	-0.0094	-0.0465	0.0077
Pb2203	mg/L	0.06087	0.0088	14.452	0.06777	0.05096	0.06387

Sb2068	mg/L	-0.00661	0.00506	76.534	-0.01167	-0.00661	-0.00155
Sb2175	mg/L	-0.02123	0.0075	35.35	-0.02708	-0.01277	-0.02383
Se1960	mg/L	0.00438	0.00453	103.39	0.00325	0.00937	0.00052
Se2039	mg/L	0.02453	0.01379	56.217	0.03445	0.00878	0.03037
Si2516	mg/L	2.8584	0.00934	0.32688	2.8478	2.8625	2.8651
Si2881	mg/L	3.0271	0.01045	0.34528	3.0153	3.0354	3.0306
Sn1899	mg/L	0.02005	0.00397	19.808	0.0222	0.02249	0.01547
Sr3464	mg/L	0.49964	0.00656	1.3123	0.49323	0.49935	0.50633
Sr4077	mg/L	0.53023	0.00205	0.38647	0.52845	0.53247	0.52977
Te2142	mg/L	0.02434	0.00404	16.592	0.02312	0.02105	0.02884
Ti3349	mg/L	0.65453	0.00592	0.90503	0.64771	0.65847	0.65739
Ti3361	mg/L	0.6604	0.004	0.60554	0.65578	0.66275	0.66267
Tl1908	mg/L	-0.01351	0.00145	10.727	-0.01483	-0.01375	-0.01196
U_3670	mg/L	-0.05904	0.03446	58.366	-0.0967	-0.0291	-0.05131
U_3859	mg/L	0.03926	0.0083	21.149	0.04055	0.03039	0.04684
V_29240	mg/L	0.13694	0.00077	0.56285	0.13767	0.13701	0.13614
Zn2062	mg/L	0.14088	0.00099	0.70103	0.13978	0.14116	0.1417
Zn2138	mg/L	0.15352	0.0008	0.52243	0.15409	0.15386	0.1526
Zn3345	mg/L	-0.62303	0.06232	10.002	-0.55133	-0.65365	-0.66412

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=B18020068-014BDIL
Username=Ron Hunt
Comment=6010.20-S
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 17:11:48
Sample Type=Unk
Mode=CONC
CorrFactor=5.000

Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	259.46	0.26255	0.10119	259.17	259.56	259.66
Ca3181	mg/L	266.25	0.85925	0.32272	265.34	267.05	266.35
Mg2790	mg/L	14.256	0.12314	0.86381	14.19	14.398	14.179
Mg2852	mg/L	14.989	0.03131	0.20889	14.964	15.024	14.979
K_7664	mg/L	5.806	0.0465	0.80086	5.779	5.8597	5.7793
K_7698	mg/L	6.7269	0.11565	1.7192	6.7727	6.8126	6.5953
Na5895	mg/L	1.879	0.0144	0.7681	1.891	1.883	1.863
Na8183	mg/L	0.87834	0.69538	79.17	1.3248	0.07713	1.2331
Ag3280	mg/L	-0.00652	0.0015	23.022	-0.00497	-0.00797	-0.00661
Al1670	mg/L	34.694	0.15611	0.44995	34.571	34.87	34.643
Al3961	mg/L	34.616	0.0856	0.2473	34.592	34.711	34.545
As1890	mg/L	0.01097	0.01893	172.56	-0.00843	0.01196	0.02938
As1937	mg/L	0.04977	0.02685	53.957	0.01961	0.05858	0.0711
Au2427	mg/L	-0.039	0.04314	110.63	0.00739	-0.04646	-0.07792
Au2675	mg/L	0.03625	0.01756	48.444	0.03238	0.05542	0.02094
B_2089	mg/L	0.03205	0.00662	20.662	0.02771	0.03968	0.02877
B_2497	mg/L	0.02842	0.00495	17.43	0.02506	0.0261	0.03411
Ba4554	mg/L	1.3921	0.00449	0.32275	1.3876	1.3966	1.3921
Ba2347	mg/L	1.4579	0.086	5.8987	1.5049	1.3587	1.5102
Be3130	mg/L	i .00301	0.00016	5.2679	i .00294	i .00319	i .00290
Be3131	mg/L	i .00224	0.00043	19.239	i .00176	i .00233	i .00261
Cd2144	mg/L	-0.00251	0.00021	8.3055	-0.00228	-0.00259	-0.00267
Cd2288	mg/L	0.00164	0.00164	100.1	0.00243	-0.00025	0.00273
Co2286	mg/L	0.03123	0.00068	2.1649	0.03201	0.0309	0.03078
Co2388	mg/L	0.0671	0.00687	10.231	0.06165	0.06485	0.07481
Cr2055	mg/L	0.01063	0.0007	6.5744	0.00982	0.01105	0.01102
Cr2666	mg/L	0.03184	0.03359	105.49	0.02572	0.06807	0.00173
Cr2677	mg/L	0.03697	0.01302	35.218	0.05121	0.02567	0.03402
Cu2199	mg/L	0.01325	0.02894	218.47	0.04573	0.00381	-0.0098
Cu3247	mg/L	0.03453	0.00618	17.888	0.03801	0.0274	0.03818
Cu3273	mg/L	0.01836	0.01351	73.574	0.00317	0.02902	0.02289

Fe2599	mg/L	94.827	0.12504	0.13187	94.864	94.929	94.687
Fe2714	mg/L	91.318	0.20374	0.22311	91.142	91.271	91.541
Hg1849	mg/L	-0.00148	0.00595	402.23	0.0018	-0.00834	0.00211
Hg1942	mg/L	0.00064	0.00586	915.71	-0.00585	0.00555	0.00223
Li6707	mg/L	0.04769	0.00196	4.1164	0.04599	0.04724	0.04984
Mn2576	mg/L	3.2392	0.00499	0.15415	3.2335	3.2414	3.2427
Mn2593	mg/L	3.0959	0.00991	0.32001	3.0911	3.1073	3.0893
Mn4033	mg/L	2.9792	0.04057	1.3616	3.0239	2.9692	2.9447
Mo2020	mg/L	0.01095	0.00267	24.391	0.01336	0.01141	0.00808
Mo2816	mg/L	-0.29147	0.00721	2.4734	-0.28491	-0.29918	-0.29031
Ni2216	mg/L	0.04093	0.00259	6.318	0.04009	0.04384	0.03887
Ni2303	mg/L	0.04501	0.00462	10.266	0.04937	0.04017	0.04551
Ni2316	mg/L	0.04334	0.00149	3.4274	0.04237	0.04259	0.04505
P_1774	mg/L	3.5141	0.03491	0.99353	3.538	3.5302	3.474
P_2149	mg/L	3.3678	0.03636	1.0796	3.4087	3.3552	3.3393
Pb2169	mg/L	-0.0066	0.0836	1258	-0.102	0.0282	0.0539
Pb2203	mg/L	0.08012	0.05763	71.924	0.09652	0.12777	0.01607
Sb2068	mg/L	-0.02063	0.02695	130.65	-0.03277	0.01026	-0.03937
Sb2175	mg/L	-0.00242	0.01856	768.3	-0.01233	-0.01391	0.01899
Se1960	mg/L	0.04855	0.03052	62.86	0.08203	0.04134	0.02228
Se2039	mg/L	0.0998	0.05257	52.681	0.16005	0.06326	0.07608
Si2516	mg/L	2.9739	0.00511	0.17192	2.9746	2.9684	2.9785
Si2881	mg/L	3.0928	0.03569	1.1541	3.0535	3.1232	3.1018
Sn1899	mg/L	0.0322	0.01109	34.45	0.01942	0.03928	0.03792
Sr3464	mg/L	0.54734	0.01596	2.9165	0.53791	0.53833	0.56577
Sr4077	mg/L	0.55066	0.00185	0.33568	0.54923	0.55275	0.54999
Te2142	mg/L	0.05863	0.02767	47.198	0.02738	0.08002	0.06849
Ti3349	mg/L	0.68106	0.00218	0.32039	0.67894	0.6833	0.68093
Ti3361	mg/L	0.6772	0.00335	0.49493	0.67748	0.68041	0.67372
Tl1908	mg/L	-0.01808	0.04175	230.97	0.02905	-0.03285	-0.05043
U_3670	mg/L	-0.12895	0.19884	154.2	-0.15739	0.08257	-0.31204
U_3859	mg/L	0.16876	0.14826	87.851	0.33993	0.08568	0.08067
V_29240	mg/L	0.14368	0.00159	1.1056	0.14514	0.14199	0.14391
Zn2062	mg/L	0.15565	0.00157	1.0109	0.15739	0.15433	0.15522
Zn2138	mg/L	0.16312	0.00146	0.89629	0.16456	0.16164	0.16316

Zn3345	mg/L	-0.62708	0.25172	40.142	-0.78279	-0.33667	-0.76178

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCV
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 17:15:33
Sample Type=QC
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	25.763	0.06413	0.24892	25.689	25.795	25.804	Chk Pass		
Ca3181	mg/L	26.322	0.10311	0.39173	26.204	26.394	26.367	Chk Pass		
Mg2790	mg/L	25.23	0.05347	0.21195	25.169	25.256	25.266	Chk Pass		
Mg2852	mg/L	25.423	0.019	0.07473	25.418	25.444	25.408	Chk Pass		
K_7664	mg/L	25.57	0.01761	0.06886	25.558	25.562	25.59	Chk Pass		
K_7698	mg/L	26.413	0.021	0.07951	26.434	26.392	26.414	Chk Pass		
Na5895	mg/L	26.31	0.0592	0.2251	26.36	26.32	26.25	Chk Pass		
Na8183	mg/L	25.367	0.12763	0.50315	25.274	25.513	25.315	Chk Pass		
Ag3280	mg/L	0.98914	0.00786	0.79425	0.98087	0.99007	0.9965	Chk Pass		
Al1670	mg/L	2.5493	0.01664	0.65272	2.5564	2.5612	2.5303	Chk Pass		
Al3961	mg/L	2.485	0.01281	0.51555	2.4744	2.4992	2.4812	Chk Pass		
As1890	mg/L	2.6315	0.01877	0.71341	2.614	2.6291	2.6514	Chk Pass		
As1937	mg/L	2.5348	0.01274	0.50262	2.5346	2.5222	2.5476	Chk Pass		
Au2427	mg/L	2.4698	0.02166	0.87708	2.4456	2.4768	2.4872	Chk Pass		

Au2675	mg/L	2.4538	0.02507	1.0216	2.4264	2.4596	2.4755	Chk Pass
B_2089	mg/L	2.5261	0.00393	0.15546	2.5261	2.5221	2.53	Chk Pass
B_2497	mg/L	2.5957	0.00458	0.17656	2.5922	2.6009	2.5939	Chk Pass
Ba4554	mg/L	2.4372	0.02554	1.0478	2.4224	2.4225	2.4667	Chk Pass
Ba2347	mg/L	2.5074	0.01875	0.7476	2.5271	2.4898	2.5052	Chk Pass
Be3130	mg/L	i 1.3020	0.00078	0.05985	i 1.3014	i 1.3029	i 1.3017	Chk Pass
Be3131	mg/L	i 1.2512	0.00035	0.02836	i 1.2516	i 1.2511	i 1.2509	Chk Pass
Cd2144	mg/L	2.4975	0.00368	0.14751	2.4987	2.5004	2.4934	Chk Pass
Cd2288	mg/L	2.4914	0.00143	0.05726	2.4903	2.4909	2.493	Chk Pass
Co2286	mg/L	2.4582	0.00149	0.06071	2.4574	2.46	2.4573	Chk Pass
Co2388	mg/L	2.5043	0.00344	0.13755	2.5021	2.5082	2.5025	Chk Pass
Cr2055	mg/L	2.5276	0.00576	0.22795	2.5209	2.5311	2.5307	Chk Pass
Cr2666	mg/L	2.5589	0.01812	0.70798	2.5384	2.5652	2.573	Chk Pass
Cr2677	mg/L	2.4957	0.00487	0.19502	2.4921	2.4937	2.5012	Chk Pass
Cu2199	mg/L	2.2539	0.0086	0.38158	2.2624	2.2452	2.254	Chk Pass
Cu3247	mg/L	2.4702	0.00737	0.29844	2.4621	2.4718	2.4766	Chk Pass
Cu3273	mg/L	2.4151	0.00527	0.21827	2.4095	2.42	2.4158	Chk Pass
Fe2599	mg/L	2.7145	0.00787	0.2901	2.7106	2.7094	2.7236	Chk Pass
Fe2714	mg/L	2.5655	0.00411	0.16011	2.5635	2.5703	2.5628	Chk Pass
Hg1849	mg/L	1.0085	0.0026	0.25762	1.0101	1.01	1.0055	Chk Pass
Hg1942	mg/L	1.0512	0.00338	0.32118	1.052	1.0541	1.0475	Chk Pass
Li6707	mg/L	1.2898	0.00268	0.2076	1.2929	1.2886	1.2879	Chk Pass
Mn2576	mg/L	2.577	0.00312	0.12105	2.5741	2.5803	2.5766	Chk Pass
Mn2593	mg/L	2.4938	0.00586	0.23494	2.4882	2.4999	2.4935	Chk Pass
Mn4033	mg/L	2.4874	0.01058	0.42549	2.4777	2.4858	2.4987	Chk Pass
Mo2020	mg/L	2.5974	0.00062	0.02372	2.5967	2.5978	2.5977	Chk Pass
Mo2816	mg/L	2.4793	0.01624	0.65509	2.4607	2.4872	2.4902	Chk Pass
Ni2216	mg/L	2.4258	0.00292	0.12056	2.4287	2.4259	2.4229	Chk Pass
Ni2303	mg/L	2.5261	0.00393	0.15559	2.5283	2.5284	2.5215	Chk Pass
Ni2316	mg/L	2.4698	0.00436	0.17649	2.4681	2.4747	2.4665	Chk Pass
P_1774	mg/L	2.6293	0.00365	0.13898	2.6274	2.6271	2.6335	Chk Pass
P_2149	mg/L	2.5141	0.01011	0.40223	2.5044	2.5246	2.5134	Chk Pass
Pb2169	mg/L	2.485	0.0223	0.8959	2.502	2.46	2.494	Chk Pass
Pb2203	mg/L	2.5165	0.00882	0.35062	2.5166	2.5076	2.5252	Chk Pass
Sb2068	mg/L	2.6007	0.00158	0.06078	2.6025	2.5997	2.6	Chk Pass

Sb2175	mg/L	2.52	0.0115	0.4564	2.5095	2.5323	2.5181	Chk Pass
Se1960	mg/L	2.4606	0.00946	0.38447	2.454	2.4563	2.4714	Chk Pass
Se2039	mg/L	2.4884	0.01882	0.75629	2.5101	2.4794	2.4758	Chk Pass
Si2516	mg/L	5.0484	0.0115	0.22771	5.0614	5.044	5.0397	Chk Pass
Si2881	mg/L	5.218	0.03089	0.59201	5.1915	5.2106	5.2519	Chk Pass
Sn1899	mg/L	2.5849	0.00325	0.12586	2.5822	2.584	2.5885	Chk Pass
Sr3464	mg/L	2.4771	0.01136	0.45843	2.464	2.4826	2.4846	Chk Pass
Sr4077	mg/L	2.4436	0.00561	0.22957	2.4384	2.4495	2.443	Chk Pass
Te2142	mg/L	2.4931	0.00795	0.31891	2.4973	2.4839	2.4981	Chk Pass
Ti3349	mg/L	2.5558	0.00378	0.14802	2.5601	2.5543	2.553	Chk Pass
Ti3361	mg/L	2.5817	0.00432	0.16752	2.584	2.5844	2.5767	Chk Pass
Tl1908	mg/L	2.4653	0.00169	0.06858	2.4634	2.466	2.4666	Chk Pass
U_3670	mg/L	2.4488	0.04508	1.8411	2.3968	2.477	2.4726	Chk Pass
U_3859	mg/L	2.5377	0.01241	0.48888	2.552	2.5305	2.5306	Chk Pass
V_29240	mg/L	2.6048	0.00236	0.09078	2.602	2.6061	2.6062	Chk Pass
Zn2062	mg/L	2.4784	0.0031	0.12493	2.4812	2.479	2.4751	Chk Pass
Zn2138	mg/L	2.5351	0.00371	0.14649	2.5355	2.5313	2.5387	Chk Pass
Zn3345	mg/L	2.4841	0.02157	0.86831	2.4901	2.4602	2.5021	Chk Pass

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCB
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 17:19:14
Sample Type=QC
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	0.01323	0.00114	8.6554	0.01338	0.01201	0.01429	Chk Pass		
Ca3181	mg/L	0.04058	0.02632	64.866	0.06464	0.01247	0.04464	Chk Pass		
Mg2790	mg/L	-0.00038	0.00894	2338	0.00262	0.00667	-0.01043	Chk Pass		
Mg2852	mg/L	0.00855	0.00103	12.016	0.00973	0.00805	0.00786	Chk Pass		
K_7664	mg/L	0.00198	0.01782	898.73	0.0206	-0.01491	0.00025	Chk Pass		
K_7698	mg/L	0.01001	0.03283	327.97	0.0346	0.0227	-0.02727	Chk Pass		
Na5895	mg/L	0.0844	0.003	3.534	0.0878	0.082	0.0836	Chk Pass		
Na8183	mg/L	-0.02332	0.03955	169.58	-0.06898	-0.00086	-0.00012	Chk Pass		
Ag3280	mg/L	-0.00094	0.00204	215.43	-0.00018	0.00059	-0.00325	None		
Al1670	mg/L	0.00109	0.00106	97.382	0.00147	0.0019	-0.00011	None		
Al3961	mg/L	-0.00123	0.00535	436.32	-0.00642	-0.00154	0.00427	Chk Pass		
As1890	mg/L	0.0005	0.00727	1444.4	-0.00626	0.00819	-0.00042	None		
As1937	mg/L	0.00143	0.00192	134.43	0.00038	0.00026	0.00365	None		
Au2427	mg/L	0.00489	0.00315	64.433	0.00813	0.00184	0.00469	None		
Au2675	mg/L	0.00989	0.00158	15.986	0.00939	0.00862	0.01167	None		
B_2089	mg/L	0.00134	0.00035	25.997	0.00156	0.00153	0.00094	Chk Pass		
B_2497	mg/L	0.00211	0.00154	73.079	0.00386	0.00097	0.0015	Chk Pass		
Ba4554	mg/L	0.00082	0.00014	17.05	0.00098	0.00072	0.00075	None		
Ba2347	mg/L	0.00224	0.01381	617.79	0.00209	-0.0115	0.01612	None		
Be3130	mg/L	i .00034	0.00003	10.096	i .00038	i .00032	i .00033	None		
Be3131	mg/L	i .00015	0.00011	70.192	i .00027	i .00009	i .00009	None		
Cd2144	mg/L	0.0007	0.00018	26.425	0.00049	0.00082	0.00079	None		
Cd2288	mg/L	0.00096	0.00018	19.026	0.00077	0.00096	0.00114	None		
Co2286	mg/L	0.00065	0.00052	80.011	0.00021	0.00122	0.00052	None		
Co2388	mg/L	0.00034	0.00161	467.1	0.0022	-0.00041	-0.00075	None		
Cr2055	mg/L	0.00073	0.00034	46.12	0.0004	0.00072	0.00107	None		
Cr2666	mg/L	-0.00186	0.00417	224.04	-0.00631	0.00197	-0.00125	None		
Cr2677	mg/L	0.00271	0.00058	21.419	0.00205	0.00292	0.00316	None		
Cu2199	mg/L	0.00283	0.0037	130.68	-0.00029	0.00187	0.00693	None		
Cu3247	mg/L	0.00192	0.00146	75.954	0.00025	0.00256	0.00295	None		
Cu3273	mg/L	0.00057	0.00257	448.82	0.0007	0.00307	-0.00206	None		
Fe2599	mg/L	0.00229	0.00118	51.308	0.00236	0.00108	0.00343	Chk Pass		

Fe2714	mg/L	0.0231	0.02784	120.51	0.00272	0.05481	0.01176	Chk Pass
Hg1849	mg/L	0.00003	0.00136	4004.7	0.00007	-0.00135	0.00137	None
Hg1942	mg/L	-0.00088	0.00219	250.18	0.00156	-0.00151	-0.00268	None
Li6707	mg/L	-0.00012	0.00069	554.63	0.00048	0.00002	-0.00088	None
Mn2576	mg/L	0.00078	0.00033	41.692	0.00116	0.00061	0.00058	None
Mn2593	mg/L	0.00079	0.00017	21.688	0.00077	0.00097	0.00063	None
Mn4033	mg/L	-0.03957	0.01361	34.389	-0.0306	-0.05523	-0.03288	None
Mo2020	mg/L	0.0009	0.00063	70.404	0.00155	0.00028	0.00086	None
Mo2816	mg/L	0.00348	0.00231	66.334	0.00536	0.0009	0.00418	None
Ni2216	mg/L	-0.00021	0.0004	185.5	-0.00067	0.00009	-0.00007	None
Ni2303	mg/L	0.00278	0.00163	58.689	0.00421	0.00313	0.001	None
Ni2316	mg/L	0.00041	0.0013	315.45	-0.00101	0.00069	0.00155	None
P_1774	mg/L	-0.00151	0.00489	323.72	-0.0039	-0.00475	0.00412	None
P_2149	mg/L	0.00434	0.00793	182.96	-0.00479	0.00827	0.00953	None
Pb2169	mg/L	-0.0103	0.0173	167.7	-0.029	0.0051	-0.0069	None
Pb2203	mg/L	-0.00267	0.00479	179.47	-0.00218	0.00186	-0.00768	None
Sb2068	mg/L	-0.00339	0.00353	104.09	-0.00029	-0.00266	-0.00724	None
Sb2175	mg/L	-0.00306	0.00469	153.45	-0.00572	0.00236	-0.00581	None
Se1960	mg/L	0.01195	0.00249	20.855	0.00907	0.01348	0.01329	None
Se2039	mg/L	0.01844	0.00224	12.13	0.01586	0.01951	0.01993	None
Si2516	mg/L	0.00349	0.00157	45.108	0.00483	0.00388	0.00176	None
Si2881	mg/L	0.00471	0.00629	133.5	0.00855	0.00815	-0.00255	None
Sn1899	mg/L	0.00339	0.00216	63.875	0.00094	0.00416	0.00506	None
Sr3464	mg/L	0.0033	0.00285	86.396	0.00621	0.0032	0.0005	None
Sr4077	mg/L	0.00082	0.00011	13.899	0.00094	0.00072	0.0008	None
Te2142	mg/L	0.01931	0.0048	24.834	0.02249	0.0138	0.02165	None
Ti3349	mg/L	0.0009	0.00023	25.145	0.00116	0.00081	0.00073	None
Ti3361	mg/L	0.00025	0.00024	97.715	0.00042	0.00036	-0.00003	None
Tl1908	mg/L	-0.00129	0.00325	252.59	-0.00076	-0.00477	0.00167	None
U_3670	mg/L	-0.01338	0.01631	121.85	0.00269	-0.01292	-0.02992	None
U_3859	mg/L	0.05479	0.01388	25.331	0.05125	0.07009	0.04302	None
V_29240	mg/L	0.00139	0.00041	29.249	0.00093	0.00171	0.00154	None
Zn2062	mg/L	0.00065	0.00015	23.764	0.00066	0.00079	0.00049	None
Zn2138	mg/L	0.00063	0.00019	31.046	0.0005	0.00053	0.00085	Chk Pass
Zn3345	mg/L	0.02296	0.0598	260.46	0.05943	-0.04606	0.05551	None

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=B18020068-014BPDS
Username=Ron Hunt
Comment=6010.20-S
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 17:23:08
Sample Type=Unk
Mode=CONC
CorrFactor=1.030
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	281.96	4.3676	1.549	277.19	282.92	285.77
Ca3181	mg/L	294.04	2.8015	0.95275	291.24	294.05	296.84
Mg2790	mg/L	59.877	0.63627	1.0626	59.293	59.782	60.555
Mg2852	mg/L	61.462	0.48402	0.78751	60.907	61.685	61.794
K_7664	mg/L	55.102	0.24656	0.44746	55.241	54.818	55.248
K_7698	mg/L	56.877	0.30205	0.53105	57.049	56.528	57.054
Na5895	mg/L	52.55	0.348	0.6623	52.85	52.16	52.63
Na8183	mg/L	49.893	0.30927	0.61987	50.108	49.539	50.032
Ag3280	mg/L	0.45098	0.0033	0.73231	0.44998	0.44829	0.45467
Al1670	mg/L	31.281	0.2605	0.83277	31.028	31.548	31.266
Al3961	mg/L	38.994	0.12646	0.3243	38.919	38.924	39.14
As1890	mg/L	1.0361	0.00086	0.08335	1.0365	1.0351	1.0366
As1937	mg/L	1.0001	0.00148	0.14788	1.0013	0.99843	1.0004
Au2427	mg/L	0.8701	0.00404	0.46416	0.86638	0.86952	0.8744
Au2675	mg/L	0.90326	0.01515	1.6772	0.89325	0.89583	0.92069

B_2089	mg/L	0.9977	0.00334	0.33474	0.9954	0.99618	1.0015
B_2497	mg/L	1.0129	0.0049	0.48419	1.0117	1.0086	1.0182
Ba4554	mg/L	2.3134	0.00813	0.35139	2.3042	2.3163	2.3197
Ba2347	mg/L	2.1951	0.01557	0.70925	2.1784	2.1978	2.2092
Be3130	mg/L	i .49131	0.00352	0.71563	i .48827	i .49049	i .49516
Be3131	mg/L	i .47327	0.00378	0.79891	i .47018	i .47214	i .47748
Cd2144	mg/L	0.44685	0.00069	0.15342	0.4461	0.44703	0.44743
Cd2288	mg/L	0.46699	0.00115	0.2453	0.46631	0.46831	0.46635
Co2286	mg/L	0.92317	0.00046	0.04956	0.92269	0.92325	0.92359
Co2388	mg/L	0.96386	0.00626	0.64948	0.95698	0.96537	0.96923
Cr2055	mg/L	0.94536	0.00136	0.14401	0.94389	0.94562	0.94658
Cr2666	mg/L	0.96397	0.00161	0.16675	0.96241	0.96562	0.9639
Cr2677	mg/L	0.94041	0.0093	0.98856	0.93108	0.94049	0.94967
Cu2199	mg/L	0.84669	0.005	0.59096	0.85218	0.84548	0.84239
Cu3247	mg/L	0.96244	0.00665	0.691	0.95708	0.96037	0.96988
Cu3273	mg/L	0.93399	0.00627	0.67104	0.93263	0.92852	0.94083
Fe2599	mg/L	89.424	0.62517	0.69911	88.869	89.302	90.101
Fe2714	mg/L	88.042	0.76767	0.87193	87.212	88.189	88.726
Hg1849	mg/L	0.92256	0.00604	0.65432	0.91587	0.92759	0.92423
Hg1942	mg/L	0.95327	0.00249	0.26089	0.9514	0.95231	0.95609
Li6707	mg/L	1.0717	0.00819	0.76425	1.0799	1.0635	1.0718
Mn2576	mg/L	7.6273	0.05978	0.78375	7.5722	7.6189	7.6908
Mn2593	mg/L	7.4161	0.05775	0.77871	7.3632	7.4073	7.4777
Mn4033	mg/L	8.1323	0.03384	0.41608	8.1712	8.11	8.1157
Mo2020	mg/L	0.98042	0.0055	0.56127	0.97408	0.98406	0.9831
Mo2816	mg/L	0.66109	0.01217	1.8406	0.65433	0.6538	0.67513
Ni2216	mg/L	0.91331	0.00186	0.20368	0.91158	0.91307	0.91527
Ni2303	mg/L	0.95213	0.001	0.10489	0.95104	0.95237	0.95299
Ni2316	mg/L	0.93636	0.0043	0.45949	0.93171	0.94019	0.93719
P_1774	mg/L	13.302	0.04098	0.30805	13.254	13.325	13.326
P_2149	mg/L	12.852	0.05158	0.40139	12.821	12.823	12.911
Pb2169	mg/L	0.9272	0.0157	1.693	0.9152	0.9216	0.945
Pb2203	mg/L	0.97222	0.00256	0.26291	0.9696	0.9747	0.97236
Sb2068	mg/L	0.96888	0.00939	0.96878	0.95805	0.97395	0.97464
Sb2175	mg/L	0.92391	0.01381	1.4948	0.92269	0.91074	0.93829

Se1960	mg/L	0.93974	0.00823	0.87583	0.94039	0.94763	0.9312
Se2039	mg/L	0.94076	0.01849	1.9654	0.93514	0.96141	0.92573
Si2516	mg/L	12.416	0.07612	0.61311	12.361	12.383	12.503
Si2881	mg/L	12.81	0.07588	0.59239	12.744	12.793	12.892
Sn1899	mg/L	0.959	0.00518	0.54034	0.95309	0.96275	0.96116
Sr3464	mg/L	1.3929	0.0173	1.2422	1.3797	1.3865	1.4125
Sr4077	mg/L	1.4517	0.01277	0.8798	1.4383	1.4533	1.4637
Te2142	mg/L	0.94685	0.00314	0.33165	0.95046	0.94476	0.94533
Ti3349	mg/L	1.5899	0.00872	0.54822	1.5821	1.5882	1.5993
Ti3361	mg/L	1.608	0.00977	0.60788	1.5995	1.6058	1.6187
Tl1908	mg/L	0.87612	0.00239	0.27239	0.87336	0.87751	0.87748
U_3670	mg/L	0.87641	0.04588	5.2355	0.92358	0.83193	0.87374
U_3859	mg/L	1.0328	0.02809	2.7197	1.0138	1.0195	1.0651
V_29240	mg/L	1.1099	0.00676	0.6093	1.104	1.1085	1.1173
Zn2062	mg/L	1.006	0.00241	0.23966	1.0038	1.0085	1.0056
Zn2138	mg/L	1.0943	0.00251	0.2293	1.0918	1.0968	1.0942
Zn3345	mg/L	0.20487	0.06071	29.634	0.16113	0.27419	0.17931

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=B18020068-014BMS3
Username=Ron Hunt
Comment=6010.20-S
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 17:27:06
Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	221.23	3.3393	1.5095	217.45	222.46	223.77
Ca3181	mg/L	231.25	1.3618	0.58888	229.72	231.71	232.33
Mg2790	mg/L	65.17	0.55212	0.8472	64.548	65.362	65.601
Mg2852	mg/L	66.405	0.4029	0.60673	65.942	66.596	66.676
K_7664	mg/L	59.721	0.53767	0.90031	59.656	60.288	59.219
K_7698	mg/L	61.926	0.63271	1.0217	61.737	62.632	61.41
Na5895	mg/L	51.73	0.5871	1.135	51.63	52.37	51.21
Na8183	mg/L	48.979	0.31538	0.64391	48.896	49.328	48.714
Ag3280	mg/L	0.434	0.00351	0.8083	0.43324	0.43782	0.43093
Al1670	mg/L	50.344	0.20078	0.39881	50.377	50.129	50.526
Al3961	mg/L	73.197	0.52584	0.71839	72.894	73.804	72.892
As1890	mg/L	1.0842	0.00294	0.27148	1.0859	1.0808	1.0859
As1937	mg/L	1.0172	0.01044	1.0259	1.0222	1.0052	1.0241
Au2427	mg/L	0.86548	0.01012	1.1691	0.85627	0.86387	0.87631
Au2675	mg/L	0.90027	0.01387	1.541	0.88772	0.91517	0.89793
B_2089	mg/L	0.96928	0.00392	0.40461	0.97373	0.96632	0.96779
B_2497	mg/L	0.99018	0.00896	0.90517	0.97986	0.99599	0.9947
Ba4554	mg/L	2.2095	0.0189	0.85559	2.2085	2.191	2.2288
Ba2347	mg/L	2.0538	0.03153	1.5352	2.0494	2.0873	2.0248
Be3130	mg/L	i .48550	0.00259	0.53389	i .48275	i .48789	i .48585
Be3131	mg/L	i .46482	0.00188	0.40419	i .46270	i .46627	i .46549
Cd2144	mg/L	0.43811	0.0007	0.15932	0.43731	0.43843	0.43859
Cd2288	mg/L	0.45724	0.00098	0.21503	0.45761	0.45612	0.45797
Co2286	mg/L	0.90869	0.00117	0.12908	0.90804	0.90799	0.91005
Co2388	mg/L	0.97219	0.00463	0.47611	0.96685	0.97512	0.97459
Cr2055	mg/L	0.93247	0.00238	0.25525	0.92985	0.93305	0.9345
Cr2666	mg/L	0.9803	0.00212	0.21625	0.97788	0.98182	0.98121
Cr2677	mg/L	0.95029	0.00702	0.73901	0.94226	0.95524	0.95338
Cu2199	mg/L	0.81631	0.00471	0.57648	0.81174	0.82114	0.81605
Cu3247	mg/L	0.95253	0.00833	0.87462	0.94535	0.96166	0.95059
Cu3273	mg/L	0.94388	0.0027	0.28578	0.94173	0.94691	0.943
Fe2599	mg/L	160.41	1.8091	1.1278	158.58	160.46	162.19
Fe2714	mg/L	160.68	0.95459	0.59409	159.59	161.09	161.36

Hg1849	mg/L	0.00159	0.00119	74.698	0.00076	0.00295	0.00106
Hg1942	mg/L	-0.00179	0.00077	43.225	-0.00098	-0.00252	-0.00187
Li6707	mg/L	1.0708	0.01244	1.1619	1.0704	1.0834	1.0586
Mn2576	mg/L	8.3333	0.04192	0.50306	8.2857	8.3646	8.3496
Mn2593	mg/L	8.0682	0.04221	0.52319	8.0198	8.0977	8.0869
Mn4033	mg/L	8.7955	0.09395	1.0682	8.7648	8.9009	8.7207
Mo2020	mg/L	0.95766	0.00242	0.25257	0.95533	0.95749	0.96016
Mo2816	mg/L	0.48693	0.0119	2.4443	0.47509	0.49889	0.48681
Ni2216	mg/L	0.9044	0.00197	0.2183	0.90276	0.90386	0.90659
Ni2303	mg/L	0.94646	0.00185	0.19556	0.94858	0.94514	0.94567
Ni2316	mg/L	0.92885	0.00416	0.44812	0.92483	0.92859	0.93314
P_1774	mg/L	12.738	0.01677	0.13168	12.718	12.746	12.749
P_2149	mg/L	12.27	0.02518	0.20525	12.241	12.285	12.284
Pb2169	mg/L	0.929	0.0184	1.984	0.9248	0.913	0.9491
Pb2203	mg/L	0.98561	0.01374	1.3942	0.96975	0.9931	0.99397
Sb2068	mg/L	0.66324	0.01025	1.546	0.675	0.65855	0.65618
Sb2175	mg/L	0.62636	0.00736	1.1745	0.61913	0.63384	0.62612
Se1960	mg/L	0.9145	0.00506	0.55336	0.90877	0.91834	0.91639
Se2039	mg/L	0.92692	0.01532	1.6523	0.9123	0.92562	0.94284
Si2516	mg/L	3.8101	0.02404	0.63088	3.7835	3.8166	3.8302
Si2881	mg/L	3.9323	0.03683	0.93659	3.8988	3.9718	3.9263
Sn1899	mg/L	0.93727	0.00613	0.65427	0.93641	0.93162	0.94379
Sr3464	mg/L	1.2875	0.00721	0.56013	1.2816	1.2854	1.2955
Sr4077	mg/L	1.3422	0.01297	0.9664	1.3321	1.3375	1.3568
Te2142	mg/L	0.95958	0.00398	0.41448	0.959	0.96382	0.95593
Ti3349	mg/L	2.5454	0.0157	0.61694	2.5307	2.5619	2.5437
Ti3361	mg/L	2.5703	0.01134	0.44121	2.5582	2.5808	2.5718
Tl1908	mg/L	0.86383	0.0132	1.5276	0.87904	0.85551	0.85693
U_3670	mg/L	1.0236	0.0575	5.618	1.0717	1.0391	0.9599
U_3859	mg/L	1.0011	0.0213	2.1277	0.99239	1.0254	0.98554
V_29240	mg/L	1.2321	0.00956	0.77573	1.2223	1.2414	1.2327
Zn2062	mg/L	1.0374	0.00134	0.1288	1.0358	1.0383	1.038
Zn2138	mg/L	1.1291	0.00313	0.27706	1.1269	1.1276	1.1326
Zn3345	mg/L	-4.7902	0.06219	1.2982	-4.7185	-4.8224	-4.8296

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=B18020068-014BMSD3
Username=Ron Hunt
Comment=6010.20-S
Custom ID1=ICP204-B
Custom ID2=200.7/6010B
Custom ID3=
Run Time=2/6/2018 17:31:14
Sample Type=Unk
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3
Ca3179	mg/L	515.44	6.1905	1.201	508.49	517.48	520.35
Ca3181	mg/L	557.88	5.3719	0.96292	551.68	561.21	560.75
Mg2790	mg/L	68.563	0.82308	1.2005	67.613	69.004	69.072
Mg2852	mg/L	70.521	0.07445	0.10557	70.599	70.451	70.512
K_7664	mg/L	62.148	0.46066	0.74124	62.107	62.627	61.709
K_7698	mg/L	64.564	0.61676	0.95527	64.532	65.196	63.963
Na5895	mg/L	51.56	0.4531	0.8787	51.68	51.94	51.06
Na8183	mg/L	48.595	0.43048	0.88585	48.398	49.089	48.298
Ag3280	mg/L	0.42565	0.00533	1.252	0.41952	0.42825	0.42918
Al1670	mg/L	54.856	0.2779	0.5066	54.706	55.176	54.684
Al3961	mg/L	86.376	0.41539	0.48091	86.196	86.851	86.081
As1890	mg/L	1.0461	0.00547	0.52268	1.0413	1.0449	1.052
As1937	mg/L	0.98409	0.0025	0.25446	0.98697	0.98247	0.98282
Au2427	mg/L	0.83765	0.00659	0.78638	0.83125	0.84441	0.83729
Au2675	mg/L	0.87543	0.0051	0.58292	0.87327	0.88126	0.87176
B_2089	mg/L	0.9645	0.00307	0.31873	0.96096	0.96657	0.96596

B_2497	mg/L	0.98332	0.00575	0.58499	0.98427	0.98854	0.97715
Ba4554	mg/L	2.4772	0.02928	1.1821	2.4744	2.4494	2.5078
Ba2347	mg/L	2.3521	0.03376	1.4355	2.3313	2.3911	2.334
Be3130	mg/L	i .47710	0.00314	0.65734	i .47408	i .48034	i .47689
Be3131	mg/L	i .45544	0.00182	0.40027	i .45353	i .45716	i .45563
Cd2144	mg/L	0.42154	0.00093	0.22102	0.42213	0.42047	0.42203
Cd2288	mg/L	0.44868	0.00129	0.28825	0.44725	0.44902	0.44976
Co2286	mg/L	0.87148	0.00168	0.19312	0.86962	0.8719	0.87291
Co2388	mg/L	0.92794	0.00541	0.58248	0.9228	0.93357	0.92746
Cr2055	mg/L	0.91192	0.00313	0.34306	0.90832	0.91343	0.914
Cr2666	mg/L	0.95115	0.00431	0.45318	0.94668	0.95528	0.9515
Cr2677	mg/L	0.9151	0.00871	0.95178	0.90511	0.91914	0.92106
Cu2199	mg/L	0.78926	0.00443	0.5619	0.79438	0.78658	0.78682
Cu3247	mg/L	0.93547	0.00305	0.32583	0.9329	0.93884	0.93466
Cu3273	mg/L	0.9187	0.00717	0.78044	0.92194	0.92369	0.91049
Fe2599	mg/L	109.96	0.78022	0.70952	109.1	110.62	110.18
Fe2714	mg/L	107.42	0.9067	0.8441	106.41	108.17	107.66
Hg1849	mg/L	0.00311	0.00109	34.975	0.00345	0.00189	0.00398
Hg1942	mg/L	-0.00405	0.00281	69.204	-0.00137	-0.00697	-0.00382
Li6707	mg/L	1.0735	0.01073	0.99945	1.0785	1.0809	1.0612
Mn2576	mg/L	8.0732	0.05749	0.71209	8.0091	8.1202	8.0903
Mn2593	mg/L	7.8032	0.05986	0.76714	7.7353	7.8484	7.826
Mn4033	mg/L	8.6705	0.0546	0.62976	8.6933	8.7099	8.6082
Mo2020	mg/L	0.91645	0.00092	0.10089	0.9154	0.91716	0.91677
Mo2816	mg/L	0.42059	0.01082	2.5729	0.40951	0.42113	0.43113
Ni2216	mg/L	0.86491	0.00135	0.15578	0.86353	0.86622	0.865
Ni2303	mg/L	0.91373	0.00411	0.44979	0.90925	0.91733	0.91462
Ni2316	mg/L	0.89133	0.00163	0.18342	0.88958	0.89159	0.89282
P_1774	mg/L	12.207	0.02073	0.16981	12.189	12.23	12.204
P_2149	mg/L	11.72	0.06759	0.57672	11.655	11.714	11.79
Pb2169	mg/L	0.9043	0.0393	4.342	0.8953	0.9473	0.8704
Pb2203	mg/L	0.94384	0.01057	1.1204	0.93938	0.95591	0.93623
Sb2068	mg/L	0.58942	0.01038	1.7603	0.59828	0.59198	0.57801
Sb2175	mg/L	0.55695	0.0027	0.48459	0.55725	0.55949	0.55412
Se1960	mg/L	0.90587	0.01317	1.4541	0.8909	0.9157	0.91099

Se2039	mg/L	0.92094	0.019	2.0626	0.91898	0.94083	0.90299
Si2516	mg/L	5.0532	0.02013	0.39829	5.0302	5.0619	5.0675
Si2881	mg/L	5.2171	0.03294	0.63142	5.1814	5.2237	5.2463
Sn1899	mg/L	0.90452	0.00272	0.30102	0.90149	0.90531	0.90676
Sr3464	mg/L	2.1421	0.02038	0.95132	2.1199	2.1599	2.1465
Sr4077	mg/L	2.2484	0.02528	1.1243	2.2601	2.2658	2.2194
Te2142	mg/L	0.93937	0.00425	0.45261	0.94288	0.93464	0.94059
Ti3349	mg/L	2.5086	0.0124	0.49446	2.4966	2.5213	2.5079
Ti3361	mg/L	2.5303	0.01262	0.49894	2.5178	2.5431	2.53
Tl1908	mg/L	0.82323	0.02356	2.8622	0.82276	0.7999	0.84702
U_3670	mg/L	0.92812	0.02999	3.2308	0.9157	0.96232	0.90634
U_3859	mg/L	0.98048	0.00857	0.87417	0.98893	0.98072	0.97179
V_29240	mg/L	1.1204	0.01079	0.96326	1.109	1.1304	1.1218
Zn2062	mg/L	1.0175	0.00281	0.2764	1.0163	1.0156	1.0208
Zn2138	mg/L	1.1359	0.00137	0.12093	1.1343	1.1367	1.1367
Zn3345	mg/L	-4.8981	0.063	1.2861	-4.8547	-4.9703	-4.8693

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCV
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 18:03:59
Sample Type=QC
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	25.949	0.02465	0.09498	25.943	25.976	25.927	Chk Pass		
Ca3181	mg/L	26.625	0.02985	0.1121	26.591	26.64	26.645	Chk Pass		
Mg2790	mg/L	25.357	0.12695	0.50066	25.317	25.499	25.254	Chk Pass		
Mg2852	mg/L	25.525	0.0451	0.17669	25.519	25.573	25.483	Chk Pass		
K_7664	mg/L	25.917	0.13057	0.5038	26.017	25.965	25.77	Chk Pass		
K_7698	mg/L	27.083	0.11414	0.42145	27.179	27.114	26.957	Chk Pass		
Na5895	mg/L	26.86	0.0652	0.2428	26.9	26.89	26.78	Chk Pass		
Na8183	mg/L	25.364	0.10043	0.39594	25.261	25.462	25.37	Chk Pass		
Ag3280	mg/L	0.99278	0.00492	0.49605	0.98785	0.99278	0.9977	Chk Pass		
Al1670	mg/L	2.5796	0.00323	0.12525	2.5825	2.5761	2.5801	Chk Pass		
Al3961	mg/L	2.5054	0.01035	0.41311	2.504	2.5164	2.4958	Chk Pass		
As1890	mg/L	2.6718	0.01342	0.50223	2.6815	2.6773	2.6565	Chk Pass		
As1937	mg/L	2.5617	0.01025	0.4003	2.557	2.5734	2.5546	Chk Pass		
Au2427	mg/L	2.4821	0.01056	0.42531	2.4708	2.4837	2.4917	Chk Pass		
Au2675	mg/L	2.4695	0.01107	0.44821	2.4573	2.479	2.472	Chk Pass		
B_2089	mg/L	2.5489	0.00289	0.11321	2.5469	2.5476	2.5522	Chk Pass		
B_2497	mg/L	2.64	0.00819	0.31008	2.6318	2.6482	2.64	Chk Pass		
Ba4554	mg/L	2.4244	0.0162	0.66816	2.4071	2.4268	2.4392	Chk Pass		
Ba2347	mg/L	2.5129	0.02388	0.95019	2.4978	2.5005	2.5404	Chk Pass		
Be3130	mg/L	i 1.3250	0.00235	0.177	i 1.3251	i 1.3273	i 1.3227	Chk Pass		
Be3131	mg/L	i 1.2563	0.00161	0.12818	i 1.2563	i 1.2579	i 1.2546	Chk Pass		
Cd2144	mg/L	2.5294	0.00413	0.16329	2.5308	2.5326	2.5247	Chk Pass		
Cd2288	mg/L	2.4984	0.00318	0.12719	2.4965	2.5021	2.4967	Chk Pass		
Co2286	mg/L	2.4655	0.00473	0.1917	2.4646	2.4706	2.4612	Chk Pass		
Co2388	mg/L	2.5433	0.00374	0.14723	2.5397	2.5472	2.5429	Chk Pass		
Cr2055	mg/L	2.5556	0.00024	0.00929	2.5559	2.5554	2.5556	Chk Pass		
Cr2666	mg/L	2.6241	0.00997	0.37995	2.6147	2.6229	2.6346	Chk Pass		
Cr2677	mg/L	2.5342	0.00359	0.14155	2.5313	2.5382	2.5332	Chk Pass		
Cu2199	mg/L	2.2465	0.01034	0.46026	2.2498	2.2547	2.2349	Chk Pass		
Cu3247	mg/L	2.4845	0.0078	0.31383	2.4819	2.4932	2.4783	Chk Pass		
Cu3273	mg/L	2.4156	0.00739	0.30602	2.4173	2.4075	2.4221	Chk Pass		
Fe2599	mg/L	F 2.7726	0.01089	0.39282	2.7663	2.7852	2.7664	Chk Fail	2.5	10.50%
Fe2714	mg/L	2.6049	0.04768	1.8303	2.5533	2.6139	2.6474	Chk Pass		
Hg1849	mg/L	1.017	0.00471	0.46312	1.0117	1.0189	1.0205	Chk Pass		

Hg1942	mg/L	1.0696	0.00291	0.27245	1.0678	1.0729	1.068	Chk Pass
Li6707	mg/L	1.3048	0.00335	0.25675	1.3058	1.3076	1.3011	Chk Pass
Mn2576	mg/L	2.6281	0.00387	0.1473	2.6287	2.6316	2.6239	Chk Pass
Mn2593	mg/L	2.5226	0.00265	0.105	2.522	2.5255	2.5203	Chk Pass
Mn4033	mg/L	2.4926	0.01816	0.72863	2.4888	2.4766	2.5124	Chk Pass
Mo2020	mg/L	2.636	0.00683	0.25926	2.6305	2.6437	2.634	Chk Pass
Mo2816	mg/L	2.5052	0.01425	0.5687	2.4894	2.5171	2.5091	Chk Pass
Ni2216	mg/L	2.4219	0.00263	0.10853	2.4224	2.4242	2.419	Chk Pass
Ni2303	mg/L	2.573	0.00354	0.13764	2.5758	2.5743	2.569	Chk Pass
Ni2316	mg/L	2.4953	0.00102	0.04104	2.4942	2.4957	2.4961	Chk Pass
P_1774	mg/L	2.6823	0.01079	0.40213	2.672	2.6814	2.6935	Chk Pass
P_2149	mg/L	2.536	0.02339	0.92225	2.5408	2.5105	2.5565	Chk Pass
Pb2169	mg/L	2.49	0.0255	1.024	2.519	2.471	2.479	Chk Pass
Pb2203	mg/L	2.5563	0.02798	1.0947	2.531	2.5863	2.5515	Chk Pass
Sb2068	mg/L	2.6505	0.01068	0.4029	2.6389	2.6599	2.6528	Chk Pass
Sb2175	mg/L	2.5453	0.00684	0.26865	2.547	2.5378	2.5511	Chk Pass
Se1960	mg/L	2.4647	0.01176	0.47721	2.4571	2.4783	2.4588	Chk Pass
Se2039	mg/L	2.5115	0.01839	0.73208	2.5293	2.5125	2.4926	Chk Pass
Si2516	mg/L	5.0738	0.01635	0.32219	5.0558	5.0876	5.078	Chk Pass
Si2881	mg/L	5.2797	0.03891	0.73693	5.2671	5.3233	5.2486	Chk Pass
Sn1899	mg/L	2.6434	0.01172	0.44355	2.6382	2.6568	2.6351	Chk Pass
Sr3464	mg/L	2.4972	0.01184	0.47414	2.4863	2.5098	2.4954	Chk Pass
Sr4077	mg/L	2.4285	0.02998	1.2345	2.4195	2.462	2.4042	Chk Pass
Te2142	mg/L	2.507	0.0107	0.42693	2.5143	2.512	2.4947	Chk Pass
Ti3349	mg/L	2.5959	0.00742	0.28567	2.5921	2.6045	2.5912	Chk Pass
Ti3361	mg/L	2.623	0.0042	0.1601	2.622	2.6276	2.6194	Chk Pass
Tl1908	mg/L	2.4702	0.0022	0.08892	2.4677	2.4719	2.4709	Chk Pass
U_3670	mg/L	2.4191	0.03928	1.6239	2.3777	2.4558	2.4237	Chk Pass
U_3859	mg/L	2.5707	0.0094	0.36554	2.5603	2.5731	2.5786	Chk Pass
V_29240	mg/L	2.6533	0.01118	0.42145	2.6461	2.6662	2.6475	Chk Pass
Zn2062	mg/L	2.4933	0.0175	0.70179	2.4992	2.507	2.4736	Chk Pass
Zn2138	mg/L	2.5634	0.00301	0.11753	2.5636	2.5662	2.5602	Chk Pass
Zn3345	mg/L	2.5743	0.06789	2.6371	2.5569	2.5168	2.6492	Chk Pass

[Internal Standards]

Elem Units Avg Stddev RSD Rep1 Rep2 Rep3

[Sample Header]
Method=ICP204-B_200_7_6010B(v11)
SampleName=CCB
Username=Ron Hunt
Comment=
Custom ID1=
Custom ID2=
Custom ID3=
Run Time=2/6/2018 18:07:41
Sample Type=QC
Mode=CONC
CorrFactor=1.000
Repeats=3

[Results]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3	chk_Pass/F	chk_Low	chk_High
Ca3179	mg/L	0.00769	0.0026	33.826	0.00996	0.00827	0.00485	Chk Pass		
Ca3181	mg/L	0.04703	0.01429	30.388	0.059	0.03121	0.05088	Chk Pass		
Mg2790	mg/L	0.00172	0.02236	1303	0.0245	-0.02019	0.00084	Chk Pass		
Mg2852	mg/L	0.00429	0.00129	29.984	0.00577	0.0034	0.00371	Chk Pass		
K_7664	mg/L	-0.01013	0.01058	104.38	-0.00597	-0.02216	-0.00227	Chk Pass		
K_7698	mg/L	0.04431	0.05935	133.93	0.10639	0.03841	-0.01186	Chk Pass		
Na5895	mg/L	0.0745	0.0045	6.096	0.0798	0.0717	0.0721	Chk Pass		
Na8183	mg/L	-0.18635	0.03366	18.065	-0.17452	-0.16019	-0.22433	Chk Pass		
Ag3280	mg/L	-0.00138	0.00096	69.482	-0.00149	-0.00037	-0.00229	None		
Al1670	mg/L	0.0006	0.00081	135.94	0.00151	0.00035	-0.00006	None		
Al3961	mg/L	-0.00242	0.00222	91.844	-0.00011	-0.00454	-0.00259	Chk Pass		
As1890	mg/L	-0.00318	0.0017	53.592	-0.00495	-0.00156	-0.00302	None		
As1937	mg/L	0.00105	0.00269	254.61	0.00049	0.00398	-0.00131	None		
Au2427	mg/L	0.00268	0.00425	158.71	0.00734	0.00169	-0.00099	None		
Au2675	mg/L	0.01076	0.00278	25.809	0.00807	0.0106	0.01362	None		
B_2089	mg/L	0.00251	0.00051	20.483	0.00195	0.00296	0.00261	Chk Pass		
B_2497	mg/L	0.00401	0.0012	29.933	0.00392	0.00286	0.00526	Chk Pass		

Ba4554	mg/L	0.00038	0.00008	20.702	0.00046	0.00039	0.0003	None
Ba2347	mg/L	0.00854	0.01688	197.62	-0.00177	0.02802	-0.00063	None
Be3130	mg/L	i .00016	0.00007	44.688	i .00021	i .00021	i .00008	None
Be3131	mg/L	i .00002	0.00007	297.82	i .00010	i -.00003	i -.00001	None
Cd2144	mg/L	0.00053	0.00016	30.243	0.00066	0.00035	0.00058	None
Cd2288	mg/L	0.00034	0.00044	127.82	0.00039	-0.00012	0.00075	None
Co2286	mg/L	0.00111	0.00043	39.152	0.00091	0.00161	0.00081	None
Co2388	mg/L	0.00063	0.00192	306.34	-0.00118	0.00265	0.00041	None
Cr2055	mg/L	0.00052	0.00078	151.05	-0.00006	0.00021	0.00141	None
Cr2666	mg/L	-0.00139	0.00464	333.41	0.0029	-0.00076	-0.00631	None
Cr2677	mg/L	0.00316	0.00159	50.363	0.00399	0.00417	0.00133	None
Cu2199	mg/L	0.00315	0.00582	184.78	-0.00357	0.00643	0.00659	None
Cu3247	mg/L	0.00067	0.00111	165.84	-0.00055	0.00093	0.00163	None
Cu3273	mg/L	-0.00125	0.00135	108.14	-0.00234	-0.00167	0.00026	None
Fe2599	mg/L	0.00062	0.00251	405.63	0.00305	0.00076	-0.00196	Chk Pass
Fe2714	mg/L	0.04753	0.01452	30.557	0.06016	0.03166	0.05078	Chk Pass
Hg1849	mg/L	0.00072	0.00144	199.26	0.00149	-0.00094	0.00162	None
Hg1942	mg/L	-0.0013	0.00171	131.75	-0.00123	0.00038	-0.00304	None
Li6707	mg/L	0.00043	0.00028	65.368	0.00031	0.00023	0.00074	None
Mn2576	mg/L	0.00025	0.00024	96.485	0.0005	0.00023	0.00002	None
Mn2593	mg/L	0.00047	0.00027	58.897	0.00061	0.00015	0.00064	None
Mn4033	mg/L	-0.04781	0.01984	41.509	-0.03937	-0.07048	-0.03358	None
Mo2020	mg/L	0.00093	0.00006	6.9514	0.00089	0.001	0.00089	None
Mo2816	mg/L	0.00372	0.00214	57.677	0.00176	0.00338	0.00601	None
Ni2216	mg/L	-0.00011	0.00045	426.41	-0.00041	-0.00032	0.00041	None
Ni2303	mg/L	0.00199	0.00093	46.569	0.00092	0.0025	0.00254	None
Ni2316	mg/L	0.00076	0.00098	129.42	0.00099	-0.00032	0.0016	None
P_1774	mg/L	-0.00039	0.00561	1440.1	0.00154	-0.00671	0.00401	None
P_2149	mg/L	-0.00597	0.0051	85.468	-0.00355	-0.01183	-0.00253	None
Pb2169	mg/L	-0.0157	0.0293	187.2	-0.0469	0.0112	-0.0113	None
Pb2203	mg/L	-0.0054	0.0082	151.94	-0.00074	-0.00059	-0.01486	None
Sb2068	mg/L	-0.00469	0.0091	194.11	-0.01009	-0.00979	0.00582	None
Sb2175	mg/L	-0.00549	0.00449	81.659	-0.00043	-0.00708	-0.00897	None
Se1960	mg/L	0.0036	0.00642	178.35	-0.00326	0.00459	0.00946	None
Se2039	mg/L	0.01308	0.00358	27.341	0.01021	0.01193	0.01708	None

Si2516	mg/L	0.00255	0.0012	47.046	0.00121	0.00352	0.00291	None
Si2881	mg/L	-0.00212	0.00606	286.06	-0.00445	-0.00666	0.00476	None
Sn1899	mg/L	-0.00001	0.00125	8878.1	-0.00073	0.00142	-0.00073	None
Sr3464	mg/L	-0.00018	0.00243	1348.9	-0.00288	0.00182	0.00052	None
Sr4077	mg/L	0.00047	0.00004	8.5721	0.00052	0.00044	0.00046	None
Te2142	mg/L	0.01949	0.00458	23.498	0.01636	0.01736	0.02475	None
Ti3349	mg/L	0.00067	0.00032	47.398	0.00068	0.00034	0.00097	None
Ti3361	mg/L	-0.00028	0.00076	265.41	0.00027	-0.00114	0.00002	None
Tl1908	mg/L	0.00199	0.00341	171.25	-0.00125	0.00554	0.00167	None
U_3670	mg/L	-0.01439	0.00598	41.526	-0.01294	-0.02096	-0.00927	None
U_3859	mg/L	0.03749	0.01001	26.69	0.02602	0.04203	0.04443	None
V_29240	mg/L	0.00122	0.00144	117.26	0.00284	0.00009	0.00074	None
Zn2062	mg/L	0.00047	0.00029	62.738	0.00016	0.0005	0.00075	None
Zn2138	mg/L	0.00043	0.00017	40.581	0.00027	0.00062	0.0004	Chk Pass
Zn3345	mg/L	-0.00285	0.04657	1631.1	-0.01727	-0.04051	0.04921	None

[Internal Standards]

Elem	Units	Avg	Stddev	RSD	Rep1	Rep2	Rep3

Energy Laboratories Inc

ANALYTICAL RUN Summary

27-Feb-18

Run ID ICPMS202-B_180206A

Run Start Date: 2/6/2018 2:34:00 P
Analyst: Jason P. Van Cleave
Ical: 0
Column ID:
Comments:

Instrument ID	Description
07J20627	Metals 100-1000 uL Adjustable Pipette
12X5317	Metals 100-1000 uL Adjustable Pipette
15549647	Metals 10-100 uL Adjustable Pipette
15571644	Metals 20-200 uL Adjusatble Pipette
340760037	Metals 100-1000 uL Adjustable Pipette
340760040	Metals 100-1000 uL Adjustable Pipette
340782036	Metals 1-5 mL Adjustable Pipette
440760303	Metals 100-1000 uL Adjustable Pipette
440760412	Metals 100-1000 uL Adjustable Pipette
440780018	Metals 1-5 mL Adjustable Pipette
440780025	Metals 1-5 mL Adjustable Pipette
440780027	Metals 1-5 mL Adjustable Pipette
ICPMS202-B	Agilent 7500a
O33504C	Metals 10-100 uL Adjustable Pipette

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
ME170822 MSCAL-5A	EL-MSCAL-5A	0.05	ml	5	ml	LFB/MS	9/11/2018
MS ICSA 171017	ICSA					ICSA	3/29/2018
MS ISCAB 171212	ICSAB					ICSAB	8/13/2018
MS171220 QCS	QCS Solution					ICV	3/15/2018
MS180103 LLRV	2017 ICPMS LLRV/LLOQ STOCK	0.05	ml	49.95	ml	LLRV	1/3/2019
MS180103 P/A	P/A Factor Solution						9/1/2018
MS180104 Spiking Solution	Spiking Solution	0.05	ml	5	ml	LFB/MS	9/1/2018
MS180104 Tune Solution	Tune Solution						7/1/2018
MS180129 ULR 2	ULR 2 for ICP-MS					ULR2	9/1/2018
MS180129 ULR 3	ULR 3 for ICP-MS					ULR3	9/28/2018
MS180201 202 0.5STD	0.5 mg/L STD for 202					CAL2	9/1/2018
MS180201 202 100STD	100 mg/L STD for 202					CAL5	9/1/2018
MS180201 202 10STD	10 mg/L STD for 202					CAL3	9/1/2018
MS180201 202 CCV	CCV for 202					CAL4/CCV	9/1/2018

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684856	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 2:52:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

1

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684856	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 2:52:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.000263	0		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.00037	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000337	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000335	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000318	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002452	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000249	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.00003	0.00003		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	-0.000273	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000312	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000342	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.005565	0.005565		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000034	0.000034		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	-0.00031	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.00034	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000006	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000281	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000188	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000254	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000033	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000213	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.00039	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000138	0		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000138	0		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000123	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000381	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000268	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000317	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000241	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684857	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 2:55:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684857	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 2:55:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.000251	0		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000393	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000378	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000346	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000372	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.003343	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000285	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000015	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000387	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000395	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000381	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.00024	0.00024		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000026	0.000026		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	-0.000362	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000374	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000006	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000376	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.00034	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000373	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000118	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.00027	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000416	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000264	0		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000264	0		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000259	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000431	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.00032	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000365	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000294	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684858	Cal Blank	ICPMS-200.8-W	SAMP		2/6/2018 2:58:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		1107762	1107762		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684858	Cal Blank	ICPMS-200.8-W	SAMP		2/6/2018 2:58:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684859	0.5 ppb std	ICPMS-200.8-W	SAMP		2/6/2018 3:00:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		1104441	1104441		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684860	10 ppb std	ICPMS-200.8-W	SAMP		2/6/2018 3:03:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		1101414	1101414		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684861	50 ppb std	ICPMS-200.8-W	SAMP		2/6/2018 3:06:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		1092760	1092760		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684862	100 ppb std	ICPMS-200.8-W	SAMP		2/6/2018 3:08:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		1086336	1086336		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684863	100 ppb Br std	ICPMS-200.8-W	SAMP		2/6/2018 3:11:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		1094116	1094116		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684864	QCS	ICPMS-200.8-W ICV			2/6/2018 3:14:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.2599	0.2599		0.25	0	0	0.0002849	0.1	4.5	104%	90	110	0%	
Antimony	A	mg/L	0.04936	0.04936		0.05	0	0	3.047E-05	0.05	18	99%	90	110	0%	
Arsenic	A	mg/L	0.0497	0.0497		0.05	0	0	6.629E-05	0.005	18	99%	90	110	0%	
Barium	A	mg/L	0.0488	0.0488		0.05	0	0	6.437E-05	0.1	18	98%	90	110	0%	
Beryllium	A	mg/L	0.02582	0.02582		0.025	0	0	8.97E-06	0.001	4.5	103%	90	110	0%	
Boron	A	mg/L	0.05135	0.05135		0.05	0	0	0.00141	0.1	4.5	103%	90	110	0%	
Cadmium	A	mg/L	0.025	0.025		0.025	0	0	1.468E-05	0.001	18	100%	90	110	0%	
Cerium	A	mg/L	0.04926	0.04926		0.05	0	0	2.257E-05	0.001	4.5	99%	90	110	0%	
Chromium	A	mg/L	0.04987	0.04987		0.05	0	0	5.576E-05	0.01	18	100%	90	110	0%	
Cobalt	A	mg/L	0.05049	0.05049		0.05	0	0	3.904E-05	0.01	18	101%	90	110	0%	
Copper	A	mg/L	0.05229	0.05229		0.05	0	0	7.681E-05	0.01	4.5	105%	90	110	0%	
Iron	A	mg/L	0.2507	0.2507		0.25	0	0	0.000175	0.02	4.5	100%	90	110	0%	
Lanthanum	A	mg/L	0.05087	0.05087		0.05	0	0	0.0000111	0.001	4.5	102%	90	110	0%	
Lead	A	mg/L	0.05071	0.05071		0.05	0	0	2.956E-05	0.01	18	101%	90	110	0%	
Manganese	A	mg/L	0.2517	0.2517		0.25	0	0	3.649E-05	0.01	18	101%	90	110	0%	
Mercury	A	mg/L	0.002047	0.002047		0.002	0	0	1.289E-05	0.001	0.36	102%	90	110	0%	
Molybdenum	A	mg/L	0.04776	0.04776		0.05	0	0	2.302E-05	0.005	9	96%	90	110	0%	
Nickel	A	mg/L	0.05065	0.05065		0.05	0	0	7.128E-05	0.01	4.5	101%	90	110	0%	
Selenium	A	mg/L	0.05008	0.05008		0.05	0	0	0.0001532	0.005	18	100%	90	110	0%	
Silver	A	mg/L	0.02644	0.02644		0.025	0	0	2.959E-05	0.005	1.8	106%	90	110	0%	
Strontium	A	mg/L	0.04891	0.04891		0.05	0	0	1.229E-05	0.1	18	98%	90	110	0%	
Thallium	A	mg/L	0.04941	0.04941		0.05	0	0	1.434E-05	0.1	18	99%	90	110	0%	
Thorium	A	mg/L	0.02148	0.02148		0.02	0	0	5.767E-05	0.001	4.5	107%	90	110	0%	
Thorium 232	A	mg/L	0.02148	0.02148		0.02	0	0	5.767E-05	0.01	4.5	107%	90	110	0%	
Tin	A	mg/L	0.04898	0.04898		0.05	0	0	5.199E-05	0.1	9	98%	90	110	0%	
Titanium	A	mg/L	0.04676	0.04676		0.05	0	0	0.0001736	0.01	18	94%	90	110	0%	
Uranium	A	mg/L	0.01993	0.01993		0.02	0	0	1.332E-05	0.001	4.5	100%	90	110	0%	
Vanadium	A	mg/L	0.04913	0.04913		0.05	0	0	7.351E-05	0.1	18	98%	90	110	0%	
Zinc	A	mg/L	0.05227	0.05227		0.05	0	0	0.0002495	0.01	4.5	105%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684865	CCV	ICPMS-200.8-W CCV			2/6/2018 3:16:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684865	CCV	ICPMS-200.8-W	CCV		2/6/2018 3:16:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0518	0.0518		0.05	0	0	0.0002849	0.1	4.5	104%	90	110	0%	
Antimony	A	mg/L	0.05237	0.05237		0.05	0	0	3.047E-05	0.05	18	105%	90	110	0%	
Arsenic	A	mg/L	0.05199	0.05199		0.05	0	0	6.629E-05	0.005	18	104%	90	110	0%	
Barium	A	mg/L	0.05188	0.05188		0.05	0	0	6.437E-05	0.1	18	104%	90	110	0%	
Beryllium	A	mg/L	0.05263	0.05263		0.05	0	0	8.97E-06	0.001	4.5	105%	90	110	0%	
Boron	A	mg/L	0.05248	0.05248		0.05	0	0	0.00141	0.1	4.5	105%	90	110	0%	
Cadmium	A	mg/L	0.05246	0.05246		0.05	0	0	1.468E-05	0.001	18	105%	90	110	0%	
Cerium	A	mg/L	0.05027	0.05027		0.05	0	0	2.257E-05	0.001	4.5	101%	90	110	0%	
Chromium	A	mg/L	0.05208	0.05208		0.05	0	0	5.576E-05	0.01	18	104%	90	110	0%	
Cobalt	A	mg/L	0.05215	0.05215		0.05	0	0	3.904E-05	0.01	18	104%	90	110	0%	
Copper	A	mg/L	0.05218	0.05218		0.05	0	0	7.681E-05	0.01	4.5	104%	90	110	0%	
Iron	A	mg/L	1.357	1.357		1.3	0	0	0.000175	0.02	4.5	104%	90	110	0%	
Lanthanum	A	mg/L	0.0513	0.0513		0.05	0	0	0.0000111	0.001	4.5	103%	90	110	0%	
Lead	A	mg/L	0.05214	0.05214		0.05	0	0	2.956E-05	0.01	18	104%	90	110	0%	
Manganese	A	mg/L	0.05213	0.05213		0.05	0	0	3.649E-05	0.01	18	104%	90	110	0%	
Mercury	A	mg/L	0.001083	0.001083		0.001	0	0	1.289E-05	0.001	0.36	108%	90	110	0%	
Molybdenum	A	mg/L	0.0524	0.0524		0.05	0	0	2.302E-05	0.005	9	105%	90	110	0%	
Nickel	A	mg/L	0.05184	0.05184		0.05	0	0	7.128E-05	0.01	4.5	104%	90	110	0%	
Selenium	A	mg/L	0.05237	0.05237		0.05	0	0	0.0001532	0.005	18	105%	90	110	0%	
Silver	A	mg/L	0.02061	0.02061		0.02	0	0	2.959E-05	0.005	1.8	103%	90	110	0%	
Strontium	A	mg/L	0.05135	0.05135		0.05	0	0	1.229E-05	0.1	18	103%	90	110	0%	
Thallium	A	mg/L	0.05063	0.05063		0.05	0	0	1.434E-05	0.1	18	101%	90	110	0%	
Thorium	A	mg/L	0.04958	0.04958		0.05	0	0	5.767E-05	0.001	4.5	99%	90	110	0%	
Thorium 232	A	mg/L	0.04958	0.04958		0.05	0	0	5.767E-05	0.01	4.5	99%	90	110	0%	
Tin	A	mg/L	0.05381	0.05381		0.05	0	0	5.199E-05	0.1	9	108%	90	110	0%	
Titanium	A	mg/L	0.051	0.051		0.05	0	0	0.0001736	0.01	18	102%	90	110	0%	
Uranium	A	mg/L	0.05169	0.05169		0.05	0	0	1.332E-05	0.001	4.5	103%	90	110	0%	
Vanadium	A	mg/L	0.05172	0.05172		0.05	0	0	7.351E-05	0.1	18	103%	90	110	0%	
Zinc	A	mg/L	0.05193	0.05193		0.05	0	0	0.0002495	0.01	4.5	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684866	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:19:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684866	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:19:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.000162	0		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000019	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000076	0.000076		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000024	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000015	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000384	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.00004	0.00004		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000057	0.000057		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000054	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	0.000013	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000025	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01038	0.01038		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000066	0.000066		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000048	0.000048		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000091	0.000091		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000032	0.000032		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000284	0.000284		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000057	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000171	0.000171		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000266	0.000266		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000051	0.000051		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.00006	0.00006		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000346	0.000346		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000346	0.000346		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.00057	0.00057		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000015	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000033	0.000033		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000027	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000003	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684867	CCB	ICPMS-200.8-W	CCB		2/6/2018 3:22:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684867	CCB	ICPMS-200.8-W	CCB		2/6/2018 3:22:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.000092	-0.000092		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000056	-0.000056		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000078	-0.000078		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000067	-0.000067		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000099	-0.000099		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000309	-0.000309		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000036	-0.000036		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000023	0.000023		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000068	-0.000068		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000079	-0.000079		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000055	-0.000055		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.006104	0.006104		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000022	0.000022		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.00007	-0.00007		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000034	-0.000034		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000007	0.000007		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000015	0.000015		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000078	-0.000078		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.00003	0.00003		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000055	0.000055		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000059	-0.000059		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000052	-0.000052		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000038	0.000038		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000038	0.000038		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000116	0.000116		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000011	-0.000011		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000075	-0.000075		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000075	-0.000075		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000138	-0.000138		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684868	LRB	ICPMS-200.8-W	MBLK		2/6/2018 3:24:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684868	LRB	ICPMS-200.8-W	MBLK		2/6/2018 3:24:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.000156	0		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000076	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000088	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000063	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000114	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000786	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000049	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000009	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000117	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000088	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.00008	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.002079	0.002079		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000006	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.00005	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000034	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000005	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000083	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000053	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000058	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000026	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000058	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.000012	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000093	0		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000093	0		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000016	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000019	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000092	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000091	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000778	0.000778		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684869	LLRV	ICPMS-200.8-W	CRI		2/6/2018 3:27:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11684869	LLRV	ICPMS-200.8-W CRI			2/6/2018 3:27:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01017	0.01017		0.01	0	0	0.0002849	0.1	4.5	102%	80	120	0%	
Antimony	A	mg/L	0.000292	0.000292		0.0005	0	0	3.047E-05	0.05	18	58%	80	120	0%	S
Arsenic	A	mg/L	0.000896	0.000896		0.001	0	0	6.629E-05	0.005	18	90%	80	120	0%	
Barium	A	mg/L	0.000215	0.000215		0.0003	0	0	6.437E-05	0.1	18	72%	80	120	0%	S
Beryllium	A	mg/L	0.000365	0.000365		0.0005	0	0	8.97E-06	0.001	4.5	73%	80	120	0%	S
Boron	A	mg/L	0.000914	0.000914		0.002	0	0	0.00141	0.1	4.5	46%	80	120	0%	S
Cadmium	A	mg/L	0.00013	0.00013		0.0002	0	0	1.468E-05	0.001	18	65%	80	120	0%	S
Cerium	A	mg/L	0.000198	0.000198		0.0002	0	0	2.257E-05	0.001	4.5	99%	80	120	0%	
Chromium	A	mg/L	0.000857	0.000857		0.001	0	0	5.576E-05	0.01	18	86%	80	120	0%	
Cobalt	A	mg/L	0.0001	0.0001		0.0002	0	0	3.904E-05	0.01	18	50%	80	120	0%	S
Copper	A	mg/L	0.001944	0.001944		0.002	0	0	7.681E-05	0.01	4.5	97%	80	120	0%	
Lanthanum	A	mg/L	0.000199	0.000199		0.0002	0	0	0.0000111	0.001	4.5	100%	80	120	0%	
Lead	A	mg/L	0.000399	0.000399		0.0005	0	0	2.956E-05	0.01	18	80%	80	120	0%	
Manganese	A	mg/L	0.000447	0.000447		0.0005	0	0	3.649E-05	0.01	18	89%	80	120	0%	
Mercury	A	mg/L	0.001357	0.001357		0.001	0	0	1.289E-05	0.001	0.36	136%	80	120	0%	S
Molybdenum	A	mg/L	0.000339	0.000339		0.0005	0	0	2.302E-05	0.005	9	68%	80	120	0%	S
Nickel	A	mg/L	0.002058	0.002058		0.002	0	0	7.128E-05	0.01	4.5	103%	80	120	0%	
Selenium	A	mg/L	0.00196	0.00196		0.002	0	0	0.0001532	0.005	18	98%	80	120	0%	
Silver	A	mg/L	0.000063	0.000063		0.0002	0	0	2.959E-05	0.005	1.8	32%	80	120	0%	S
Strontium	A	mg/L	0.000405	0.000405		0.0005	0	0	1.229E-05	0.1	18	81%	80	120	0%	
Thallium	A	mg/L	0.000462	0.000462		0.0005	0	0	1.434E-05	0.1	18	92%	80	120	0%	
Thorium	A	mg/L	0.005852	0.005852		0.01	0	0	5.767E-05	0.001	4.5	59%	80	120	0%	S
Thorium 232	A	mg/L	0.005852	0.005852		0.01	0	0	5.767E-05	0.01	4.5	59%	70	130	0%	S
Tin	A	mg/L	0.000823	0.000823		0.001	0	0	5.199E-05	0.1	9	82%	80	120	0%	
Titanium	A	mg/L	0.00094	0.00094		0.001	0	0	0.0001736	0.01	18	94%	80	120	0%	
Uranium	A	mg/L	0.000389	0.000389		0.0005	0	0	1.332E-05	0.001	4.5	78%	80	120	0%	S
Vanadium	A	mg/L	0.001849	0.001849		0.002	0	0	7.351E-05	0.1	18	92%	80	120	0%	
Zinc	A	mg/L	0.004978	0.004978		0.005	0	0	0.0002495	0.01	4.5	100%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685107	LFB	ICPMS-200.8-W LFB			2/6/2018 3:30:00	1.02	R294337		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685107	LFB	ICPMS-200.8-W	LFB		2/6/2018 3:30:00	1.02	R294337		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04996	0.0509592		0.05	0	0	0.0002906	0.1	4.5	102%	85	115	0%	
Antimony	A	mg/L	0.04908	0.0500616		0.05	0	0	3.108E-05	0.05	18	100%	85	115	0%	
Arsenic	A	mg/L	0.05064	0.0516528		0.05	0	0	6.762E-05	0.005	18	103%	85	115	0%	
Barium	A	mg/L	0.05034	0.0513468		0.05	0	0	6.566E-05	0.1	18	103%	85	115	0%	
Beryllium	A	mg/L	0.05015	0.051153		0.05	0	0	9.149E-06	0.001	4.5	102%	85	115	0%	
Boron	A	mg/L	0.04781	0.0487662		0.05	0	0	0.0014382	0.1	4.5	98%	85	115	0%	
Cadmium	A	mg/L	0.04977	0.0507654		0.05	0	0	1.497E-05	0.001	18	102%	85	115	0%	
Cerium	A	mg/L	0.05026	0.0512652		0.05	0	0	2.302E-05	0.001	4.5	103%	85	115	0%	
Chromium	A	mg/L	0.05027	0.0512754		0.05	0	0	5.688E-05	0.01	18	103%	85	115	0%	
Cobalt	A	mg/L	0.05017	0.0511734		0.05	0	0	3.982E-05	0.01	18	102%	85	115	0%	
Copper	A	mg/L	0.04998	0.0509796		0.05	0	0	7.835E-05	0.01	4.5	102%	85	115	0%	
Iron	A	mg/L	5.081	5.18262		5	0.002079	0	0.0001785	0.02	4.5	104%	85	115	0%	
Lanthanum	A	mg/L	0.05144	0.0524688		0.05	0	0	1.132E-05	0.001	4.5	105%	85	115	0%	
Lead	A	mg/L	0.05111	0.0521322		0.05	0	0	3.015E-05	0.01	18	104%	85	115	0%	
Manganese	A	mg/L	0.05058	0.0515916		0.05	0	0	3.722E-05	0.01	18	103%	85	115	0%	
Mercury	A	mg/L	0.00109	0.0011118		0.001	0	0	1.315E-05	0.001	0.36	111%	85	115	0%	
Molybdenum	A	mg/L	0.05073	0.0517446		0.05	0	0	2.348E-05	0.005	9	103%	85	115	0%	
Nickel	A	mg/L	0.04988	0.0508776		0.05	0	0	7.271E-05	0.01	4.5	102%	85	115	0%	
Selenium	A	mg/L	0.04931	0.0502962		0.05	0	0	0.0001563	0.005	18	101%	85	115	0%	
Silver	A	mg/L	0.0194	0.019788		0.02	0	0	3.018E-05	0.005	1.8	99%	85	115	0%	
Strontium	A	mg/L	0.05048	0.0514896		0.05	0	0	1.254E-05	0.1	18	103%	85	115	0%	
Thallium	A	mg/L	0.04961	0.0506022		0.05	0	0	1.463E-05	0.1	18	101%	85	115	0%	
Thorium	A	mg/L	0.05263	0.0536826		0.05	0	0	5.882E-05	0.001	4.5	107%	85	115	0%	
Thorium 232	A	mg/L	0.05263	0.0536826		0.05	0	0	5.882E-05	0.01	4.5	107%	85	115	0%	
Tin	A	mg/L	0.05016	0.0511632		0.05	0	0	5.303E-05	0.1	9	102%	85	115	0%	
Titanium	A	mg/L	0.05643	0.0575586		0.05	0	0	0.0001771	0.01	18	115%	85	115	0%	
Uranium	A	mg/L	0.05142	0.0524484		0.05	0	0	1.359E-05	0.001	4.5	105%	85	115	0%	
Vanadium	A	mg/L	0.05115	0.052173		0.05	0	0	7.498E-05	0.1	18	104%	85	115	0%	
Zinc	A	mg/L	0.04967	0.0506634		0.05	0.000778	0	0.0002545	0.01	4.5	100%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685108	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:32:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685108	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:32:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000193	0.000193		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	-0.000009	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000032	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000015	0.000015		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000026	0.000026		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000169	0.000169		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000006	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000002	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01999	0.01999		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000031	0.000031		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000042	0.000042		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000064	0.000064		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000016	0.000016		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000127	0.000127		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.00005	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000093	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000268	0.000268		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000002	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.000128	0.000128		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000281	0.000281		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	-0.000001	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.00001	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000028	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000061	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685109	ICSA	ICPMS-200.8-W	ICSA		2/6/2018 3:35:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	38.38	38.38		40	0	0	0.0002849	0.1	4.5	96%	70	130	0%	
Antimony	A	mg/L	0.00014	0.00014		0	0	0	3.047E-05	0.05	18	0%			0%	
Arsenic	A	mg/L	0.00006	0.00006		0	0	0	6.629E-05	0.005	18	0%			0%	
Barium	A	mg/L	0.00003	0.00003		0	0	0	6.437E-05	0.1	18	0%			0%	
Beryllium	A	mg/L	-0.00013	-0.00013		0	0	0	8.97E-06	0.001	4.5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685109	ICSA	ICPMS-200.8-W	ICSA		2/6/2018 3:35:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.0477	0.0477		0	0	0	0.00141	0.1	4.5	0%			0%	
Cadmium	A	mg/L	-0.0001	-0.0001		0	0	0	1.468E-05	0.001	18	0%			0%	
Cerium	A	mg/L	0.00003	0.00003		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.00184	0.00184		0	0	0	5.576E-05	0.01	18	0%			0%	
Cobalt	A	mg/L	0.00004	0.00004		0	0	0	3.904E-05	0.01	18	0%			0%	
Copper	A	mg/L	0.00126	0.00126		0	0	0	7.681E-05	0.01	4.5	0%			0%	
Iron	A	mg/L	88.81	88.81		100	0	0	0.000175	0.02	4.5	89%	70	130	0%	
Lanthanum	A	mg/L	0.00001	0.00001		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.00031	0.00031		0	0	0	2.956E-05	0.01	18	0%			0%	
Manganese	A	mg/L	0.00024	0.00024		0	0	0	3.649E-05	0.01	18	0%			0%	
Mercury	A	mg/L	0.00003	0.00003		0	0	0	1.289E-05	0.001	0.36	0%			0%	
Molybdenum	A	mg/L	0.8207	0.8207		0.8	0	0	2.302E-05	0.005	9	103%	70	130	0%	
Nickel	A	mg/L	0.00123	0.00123		0	0	0	7.128E-05	0.01	4.5	0%			0%	
Selenium	A	mg/L	-0.00013	-0.00013		0	0	0	0.0001532	0.005	18	0%			0%	
Silver	A	mg/L	0.00038	0.00038		0	0	0	2.959E-05	0.005	1.8	0%			0%	
Strontium	A	mg/L	0.00042	0.00042		0	0	0	1.229E-05	0.1	18	0%			0%	
Thallium	A	mg/L	-0.00003	-0.00003		0	0	0	1.434E-05	0.1	18	0%			0%	
Thorium	A	mg/L	0.00512	0.00512		0	0	0	5.767E-05	0.001	4.5	0%			0%	
Thorium 232	A	mg/L	0.00512	0.00512		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.00017	0.00017		0	0	0	5.199E-05	0.1	9	0%			0%	
Titanium	A	mg/L	0.7912	0.7912		0.8	0	0	0.0001736	0.01	18	99%			0%	
Uranium	A	mg/L	-0.00009	-0.00009		0	0	0	1.332E-05	0.001	4.5	0%			0%	
Vanadium	A	mg/L	0.00006	0.00006		0	0	0	7.351E-05	0.1	18	0%			0%	
Zinc	A	mg/L	0.00214	0.00214		0	0	0	0.0002495	0.01	4.5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685110	ICSAB	ICPMS-200.8-W	ICSAB		2/6/2018 3:38:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	37.62	37.62		40	0	0	0.0002849	0.1	4.5	94%	70	130	0%	
Antimony	A	mg/L	0.00003	0.00003		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.00997	0.00997		0.01	0	0	6.629E-05	0.005	18	100%	70	130	0%	
Barium	A	mg/L	0	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00012	-0.00012		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.00098	0.00098		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685110	ICSAB	ICPMS-200.8-W	ICSAB		2/6/2018 3:38:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium	A	mg/L	0.01	0.01		0.01	0	0	1.468E-05	0.001	18	100%	70	130	0%	
Cerium	A	mg/L	0.00004	0.00004		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.02022	0.02022		0.02	0	0	5.576E-05	0.01	18	101%	70	130	0%	
Cobalt	A	mg/L	0.0193	0.0193		0.02	0	0	3.904E-05	0.01	18	97%	70	130	0%	
Copper	A	mg/L	0.02009	0.02009		0.02	0	0	7.681E-05	0.01	4.5	100%	70	130	0%	
Iron	A	mg/L	86.69	86.69		100	0	0	0.000175	0.02	4.5	87%	70	130	0%	
Lanthanum	A	mg/L	0.00002	0.00002		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.00031	0.00031		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.01926	0.01926		0.02	0	0	3.649E-05	0.01	18	96%	70	130	0%	
Mercury	A	mg/L	0.00001	0.00001		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.8124	0.8124		0.8	0	0	2.302E-05	0.005	9	102%	70	130	0%	
Nickel	A	mg/L	0.02065	0.02065		0.02	0	0	7.128E-05	0.01	4.5	103%	70	130	0%	
Selenium	A	mg/L	0.00904	0.00904		0.01	0	0	0.0001532	0.005	18	90%	70	130	0%	
Silver	A	mg/L	0.0204	0.0204		0.02	0	0	2.959E-05	0.005	1.8	102%	70	130	0%	
Strontium	A	mg/L	0.00038	0.00038		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.00008	-0.00008		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.0019	0.0019		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.0019	0.0019		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.00005	-0.00005		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.7744	0.7744		0.8	0	0	0.0001736	0.01	18	97%	70	130	0%	
Uranium	A	mg/L	-0.00009	-0.00009		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.0191	0.0191		0.02	0	0	7.351E-05	0.1	18	96%	70	130	0%	
Zinc	A	mg/L	0.01114	0.01114		0.01	0	0	0.0002495	0.01	4.5	111%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685111	ULR3	ICPMS-6020-W-	ULR3		2/6/2018 3:40:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	5.119	5.119		5	0	0	3.047E-05	0.001	5	102%	90	110	0%	
Molybdenum	A	mg/L	5.108	5.108		5	0	0	2.302E-05	0.001	5	102%	90	110	0%	
Tin	A	mg/L	5.262	5.262		5	0	0	5.199E-05	0.001	5	105%	90	110	0%	
Titanium	A	mg/L	4.503	4.503		5	0	0	0.0001736	0.001	5	90%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685112	ULR2	ICPMS-6020-W-	ULR2		2/6/2018 3:43:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	4.464	4.464		5	0	0	0.0002849	0.001	5	89%	90	110	0%	S
Arsenic	A	mg/L	4.863	4.863		5	0	0	6.629E-05	0.001	5	97%	90	110	0%	
Barium	A	mg/L	4.849	4.849		5	0	0	6.437E-05	0.001	5	97%	90	110	0%	
Beryllium	A	mg/L	4.781	4.781		5	0	0	8.97E-06	0.001	5	96%	90	110	0%	
Boron	A	mg/L	5.31	5.31		5	0	0	0.00141	0.00141	5	106%	90	110	0%	
Cadmium	A	mg/L	4.996	4.996		5	0	0	5.635E-05	0.001	5	100%	90	110	0%	
Chromium	A	mg/L	4.446	4.446		5	0	0	5.576E-05	0.001	5	89%	90	110	0%	S
Cobalt	A	mg/L	4.786	4.786		5	0	0	3.904E-05	0.001	5	96%	90	110	0%	
Copper	A	mg/L	5.124	5.124		5	0	0	7.681E-05	0.001	5	102%	90	110	0%	
Iron	A	mg/L	4.505	4.505		5	0	0	0.000175	0.001	10	90%	90	110	0%	
Lead	A	mg/L	4.99	4.99		5	0	0	2.956E-05	0.001	5	100%	90	110	0%	
Manganese	A	mg/L	4.523	4.523		5	0	0	3.649E-05	0.001	5	90%	90	110	0%	
Nickel	A	mg/L	4.772	4.772		5	0	0	7.128E-05	0.001	5	95%	90	110	0%	
Selenium	A	mg/L	5.006	5.006		5	0	0	0.0001532	0.001	5	100%	90	110	0%	
Silver	A	mg/L	2.146	2.146		2	0	0	2.959E-05	0.001	1	107%	90	110	0%	
Strontium	A	mg/L	4.73	4.73		5	0	0	1.229E-05	0.001	5	95%	90	110	0%	
Thallium	A	mg/L	4.832	4.832		5	0	0	1.434E-05	0.001	5	97%	90	110	0%	
Thorium	A	mg/L	5.255	5.255		5	0	0	5.767E-05	0.001	5	105%	90	110	0%	
Uranium	A	mg/L	5.01	5.01		5	0	0	1.332E-05	0.0003	5	100%	90	110	0%	
Vanadium	A	mg/L	4.481	4.481		5	0	0	7.351E-05	0.001	5	90%	90	110	0%	
Zinc	A	mg/L	4.945	4.945		5	0	0	0.0002495	0.001	5	99%	90	110	0%	
Iron, Ferrous	C	mg/L	4.505	4.505		0	0	0	0.000175	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685113	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:45:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.002227	0.002227		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.004499	0.004499		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.003829	0.003829		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.003602	0.003602		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.003801	0.003801		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000013	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.00346	0.00346		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.003558	0.003558		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685113	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:45:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	A	mg/L	0.003817	0.003817		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.00001	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.004095	0.004095		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.003691	0.003691		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000001	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.00314	0.00314		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.003723	0.003723		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.005455	0.005455		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.002364	0.002364		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.003547	0.003547		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.004082	0.004082		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.002026	0.002026		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.002294	0.002294		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.003784	0.003784		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.003447	0.003447		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.003699	0.003699		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685114	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:48:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.001376	0.001376		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.001939	0.001939		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.00165	0.00165		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Cerium	A	mg/L	-0.000011	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.001465	0.001465		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.001632	0.001632		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.001815	0.001815		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.000014	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.002199	0.002199		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.001877	0.001877		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000001	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.001725	0.001725		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.001755	0.001755		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.002135	0.002135		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685114	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:48:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	0.001003	0.001003		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.001604	0.001604		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.001827	0.001827		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.001052	0.001052		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.001345	0.001345		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Vanadium	A	mg/L	0.001442	0.001442		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.001687	0.001687		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685115	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:50:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000919	0.000919		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.001229	0.001229		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.001041	0.001041		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Cerium	A	mg/L	-0.000017	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000824	0.000824		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.001018	0.001018		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.001132	0.001132		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.01845	0.01845		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.000012	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.001468	0.001468		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.001261	0.001261		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000002	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.00105	0.00105		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.001107	0.001107		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.001486	0.001486		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000655	0.000655		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.001018	0.001018		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.00121	0.00121		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000615	0.000615		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000898	0.000898		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Vanadium	A	mg/L	0.000955	0.000955		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000996	0.000996		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685116	CCV	ICPMS-200.8-W	CCV		2/6/2018 3:53:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.05695	0.05695		0.05	0	0	0.0002849	0.1	4.5	114%	90	110	0%	S
Antimony	A	mg/L	0.05414	0.05414		0.05	0	0	3.047E-05	0.05	18	108%	90	110	0%	
Arsenic	A	mg/L	0.05358	0.05358		0.05	0	0	6.629E-05	0.005	18	107%	90	110	0%	
Barium	A	mg/L	0.05322	0.05322		0.05	0	0	6.437E-05	0.1	18	106%	90	110	0%	
Beryllium	A	mg/L	0.05215	0.05215		0.05	0	0	8.97E-06	0.001	4.5	104%	90	110	0%	
Boron	A	mg/L	0.05893	0.05893		0.05	0	0	0.00141	0.1	4.5	118%	90	110	0%	S
Cadmium	A	mg/L	0.05432	0.05432		0.05	0	0	1.468E-05	0.001	18	109%	90	110	0%	
Cerium	A	mg/L	0.0521	0.0521		0.05	0	0	2.257E-05	0.001	4.5	104%	90	110	0%	
Chromium	A	mg/L	0.05019	0.05019		0.05	0	0	5.576E-05	0.01	18	100%	90	110	0%	
Cobalt	A	mg/L	0.05146	0.05146		0.05	0	0	3.904E-05	0.01	18	103%	90	110	0%	
Copper	A	mg/L	0.0539	0.0539		0.05	0	0	7.681E-05	0.01	4.5	108%	90	110	0%	
Iron	A	mg/L	1.323	1.323		1.3	0	0	0.000175	0.02	4.5	102%	90	110	0%	
Lanthanum	A	mg/L	0.05234	0.05234		0.05	0	0	0.0000111	0.001	4.5	105%	90	110	0%	
Lead	A	mg/L	0.05423	0.05423		0.05	0	0	2.956E-05	0.01	18	108%	90	110	0%	
Manganese	A	mg/L	0.05106	0.05106		0.05	0	0	3.649E-05	0.01	18	102%	90	110	0%	
Mercury	A	mg/L	0.001101	0.001101		0.001	0	0	1.289E-05	0.001	0.36	110%	90	110	0%	
Molybdenum	A	mg/L	0.05304	0.05304		0.05	0	0	2.302E-05	0.005	9	106%	90	110	0%	
Nickel	A	mg/L	0.05312	0.05312		0.05	0	0	7.128E-05	0.01	4.5	106%	90	110	0%	
Selenium	A	mg/L	0.0527	0.0527		0.05	0	0	0.0001532	0.005	18	105%	90	110	0%	
Silver	A	mg/L	0.02101	0.02101		0.02	0	0	2.959E-05	0.005	1.8	105%	90	110	0%	
Strontium	A	mg/L	0.0523	0.0523		0.05	0	0	1.229E-05	0.1	18	105%	90	110	0%	
Thallium	A	mg/L	0.05253	0.05253		0.05	0	0	1.434E-05	0.1	18	105%	90	110	0%	
Thorium	A	mg/L	0.05822	0.05822		0.05	0	0	5.767E-05	0.001	4.5	116%	90	110	0%	S
Thorium 232	A	mg/L	0.05822	0.05822		0.05	0	0	5.767E-05	0.01	4.5	116%	90	110	0%	S
Tin	A	mg/L	0.05479	0.05479		0.05	0	0	5.199E-05	0.1	9	110%	90	110	0%	
Titanium	A	mg/L	0.0509	0.0509		0.05	0	0	0.0001736	0.01	18	102%	90	110	0%	
Uranium	A	mg/L	0.05472	0.05472		0.05	0	0	1.332E-05	0.001	4.5	109%	90	110	0%	
Vanadium	A	mg/L	0.05024	0.05024		0.05	0	0	7.351E-05	0.1	18	100%	90	110	0%	
Zinc	A	mg/L	0.05328	0.05328		0.05	0	0	0.0002495	0.01	4.5	107%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685117	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 3:56:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685118	CCB	ICPMS-200.8-W	CCB		2/6/2018 3:58:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.003723	0.003723		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000322	0.000322		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.0004	0.0004		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000319	0.000319		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000265	0.000265		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.002439	0.002439		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.00034	0.00034		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000004	-0.000004		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000259	0.000259		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	0.000302	0.000302		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000301	0.000301		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.008522	0.008522		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	-0.000005	-0.000005		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000359	0.000359		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000374	0.000374		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000006	-0.000006		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000378	0.000378		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000352	0.000352		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000411	0.000411		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000246	0.000246		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000294	0.000294		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.00045	0.00045		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000549	0.000549		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000549	0.000549		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000194	0.000194		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000319	0.000319		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000306	0.000306		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000247	0.000247		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.00028	0.00028		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685185	QCS	ICPMS-6020-W-	ICV		2/6/2018 3:14:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685185	QCS	ICPMS-6020-W-	ICV		2/6/2018 3:14:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.2599	0.2599		0.25	0	0	0.0002849	0.001	5	104%	90	110	0%	
Antimony	A	mg/L	0.04936	0.04936		0.05	0	0	3.047E-05	0.001	5	99%	90	110	0%	
Arsenic	A	mg/L	0.0497	0.0497		0.05	0	0	6.629E-05	0.001	5	99%	90	110	0%	
Barium	A	mg/L	0.0488	0.0488		0.05	0	0	6.437E-05	0.001	5	98%	90	110	0%	
Beryllium	A	mg/L	0.02582	0.02582		0.025	0	0	8.97E-06	0.001	5	103%	90	110	0%	
Boron	A	mg/L	0.05135	0.05135		0.05	0	0	0.00141	0.00141	5	103%	90	110	0%	
Cadmium	A	mg/L	0.02509	0.02509		0.025	0	0	5.635E-05	0.001	5	100%	90	110	0%	
Cerium	A	mg/L	0.04926	0.04926		0	0	0		0.001		0%	0	0	0%	
Chromium	A	mg/L	0.04987	0.04987		0.05	0	0	5.576E-05	0.001	5	100%	90	110	0%	
Cobalt	A	mg/L	0.05049	0.05049		0.05	0	0	3.904E-05	0.001	5	101%	90	110	0%	
Copper	A	mg/L	0.05229	0.05229		0.05	0	0	7.681E-05	0.001	5	105%	90	110	0%	
Iron	A	mg/L	0.2507	0.2507		0.25	0	0	0.000175	0.001	10	100%	90	110	0%	
Lead	A	mg/L	0.05071	0.05071		0.05	0	0	2.956E-05	0.001	5	101%	90	110	0%	
Manganese	A	mg/L	0.2517	0.2517		0.25	0	0	3.649E-05	0.001	5	101%	90	110	0%	
Mercury	A	mg/L	0.002047	0.002047		0.002	0	0	1.289E-05	0.001	0.5	102%	90	110	0%	
Molybdenum	A	mg/L	0.04776	0.04776		0.05	0	0	2.302E-05	0.001	5	96%	90	110	0%	
Nickel	A	mg/L	0.05065	0.05065		0.05	0	0	7.128E-05	0.001	5	101%	90	110	0%	
Selenium	A	mg/L	0.05008	0.05008		0.05	0	0	0.0001532	0.001	5	100%	90	110	0%	
Silver	A	mg/L	0.02644	0.02644		0.025	0	0	2.959E-05	0.001	1	106%	90	110	0%	
Strontium	A	mg/L	0.04891	0.04891		0.05	0	0	1.229E-05	0.001	5	98%	90	110	0%	
Thallium	A	mg/L	0.04941	0.04941		0.05	0	0	1.434E-05	0.001	5	99%	90	110	0%	
Thorium	A	mg/L	0.02148	0.02148		0.02	0	0	5.767E-05	0.001	5	107%	90	110	0%	
Tin	A	mg/L	0.04898	0.04898		0.05	0	0	5.199E-05	0.001	5	98%	90	110	0%	
Titanium	A	mg/L	0.04676	0.04676		0.05	0	0	0.0001736	0.001	5	94%	90	110	0%	
Uranium	A	mg/L	0.01993	0.01993		0.02	0	0	1.332E-05	0.0003	5	100%	90	110	0%	
Vanadium	A	mg/L	0.04913	0.04913		0.05	0	0	7.351E-05	0.001	5	98%	90	110	0%	
Zinc	A	mg/L	0.05227	0.05227		0.05	0	0	0.0002495	0.001	5	105%	90	110	0%	
Iron, Ferrous	C	mg/L	0.2507	0.2507		0	0	0	0.000175	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685186	LRB	ICPMS-6020-W-	MBLK		2/6/2018 3:24:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685186	LRB	ICPMS-6020-W-	MBLK		2/6/2018 3:24:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.000156	0		0	0	0	0.0002849	0.001	5	0%	0	0	0%	
Antimony	A	mg/L	-0.000076	0		0	0	0	3.047E-05	0.001	5	0%	0	0	0%	
Arsenic	A	mg/L	-0.000088	0		0	0	0	6.629E-05	0.001	5	0%	0	0	0%	
Barium	A	mg/L	-0.000063	0		0	0	0	6.437E-05	0.001	5	0%	0	0	0%	
Beryllium	A	mg/L	-0.000114	0		0	0	0	8.97E-06	0.001	5	0%	0	0	0%	
Boron	A	mg/L	-0.000786	0		0	0	0	0.00141	0.00141	5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000049	0		0	0	0	5.635E-05	0.001	5	0%	0	0	0%	
Cerium	A	mg/L	0.000009	0.000009		0	0	0		0.001		0%	0	0	0%	
Chromium	A	mg/L	-0.000117	0		0	0	0	5.576E-05	0.001	5	0%	0	0	0%	
Cobalt	A	mg/L	-0.000088	0		0	0	0	3.904E-05	0.001	5	0%	0	0	0%	
Copper	A	mg/L	-0.00008	0		0	0	0	7.681E-05	0.001	5	0%	0	0	0%	
Iron	A	mg/L	0.002079	0.002079		0	0	0	0.000175	0.001	10	0%	0	0	0%	
Lead	A	mg/L	-0.00005	0		0	0	0	2.956E-05	0.001	5	0%	0	0	0%	
Manganese	A	mg/L	-0.000034	0		0	0	0	3.649E-05	0.001	5	0%	0	0	0%	
Mercury	A	mg/L	0.000005	0		0	0	0	1.289E-05	0.001	0.5	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000083	0		0	0	0	2.302E-05	0.001	5	0%	0	0	0%	
Nickel	A	mg/L	-0.000053	0		0	0	0	7.128E-05	0.001	5	0%	0	0	0%	
Selenium	A	mg/L	0.000058	0		0	0	0	0.0001532	0.001	5	0%	0	0	0%	
Silver	A	mg/L	-0.000026	0		0	0	0	2.959E-05	0.001	1	0%	0	0	0%	
Strontium	A	mg/L	-0.000058	0		0	0	0	1.229E-05	0.001	5	0%	0	0	0%	
Thallium	A	mg/L	0.000012	0		0	0	0	1.434E-05	0.001	5	0%	0	0	0%	
Thorium	A	mg/L	-0.000093	0		0	0	0	5.767E-05	0.001	5	0%	0	0	0%	
Tin	A	mg/L	-0.000016	0		0	0	0	5.199E-05	0.001	5	0%	0	0	0%	
Titanium	A	mg/L	0.000019	0		0	0	0	0.0001736	0.001	5	0%	0	0	0%	
Uranium	A	mg/L	-0.000092	0		0	0	0	1.332E-05	0.0003	5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000091	0		0	0	0	7.351E-05	0.001	5	0%	0	0	0%	
Zinc	A	mg/L	0.000778	0.000778		0	0	0	0.0002495	0.001	5	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.002079	0.002079		0	0	0	0.000175	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685187	LLRV	ICPMS-6020-W-	CRI		2/6/2018 3:27:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685187	LLRV	ICPMS-6020-W-	CRI		2/6/2018 3:27:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01017	0.01017		0.01	0	0	0.0002849	0.001	5	102%	80	120	0%	
Antimony	A	mg/L	0.000292	0.000292		0.0005	0	0	3.047E-05	0.001	5	58%	80	120	0%	S
Arsenic	A	mg/L	0.000896	0.000896		0.001	0	0	6.629E-05	0.001	5	90%	80	120	0%	
Barium	A	mg/L	0.000215	0.000215		0.0003	0	0	6.437E-05	0.001	5	72%	80	120	0%	S
Beryllium	A	mg/L	0.000365	0.000365		0.0005	0	0	8.97E-06	0.001	5	73%	80	120	0%	S
Boron	A	mg/L	0.000914	0.000914		0.002	0	0	0.00141	0.00141	5	46%	80	120	0%	S
Cadmium	A	mg/L	0.000132	0.000132		0.0002	0	0	5.635E-05	0.001	5	66%	80	120	0%	S
Cerium	A	mg/L	0.000198	0.000198		0.0002	0	0		0.001		99%	80	120	0%	
Chromium	A	mg/L	0.000857	0.000857		0.001	0	0	5.576E-05	0.001	5	86%	80	120	0%	
Cobalt	A	mg/L	0.0001	0.0001		0.0002	0	0	3.904E-05	0.001	5	50%	80	120	0%	S
Copper	A	mg/L	0.001944	0.001944		0.002	0	0	7.681E-05	0.001	5	97%	80	120	0%	
Iron	A	mg/L	0.008297	0.008297		0.0005	0	0	0.000175	0.001	10	1659%	80	120	0%	S
Lead	A	mg/L	0.000399	0.000399		0.0005	0	0	2.956E-05	0.001	5	80%	80	120	0%	
Manganese	A	mg/L	0.000447	0.000447		0.0005	0	0	3.649E-05	0.001	5	89%	80	120	0%	
Mercury	A	mg/L	0.001357	0.001357		0.001	0	0	1.289E-05	0.001	0.5	136%	80	120	0%	S
Molybdenum	A	mg/L	0.000339	0.000339		0.0005	0	0	2.302E-05	0.001	5	68%	80	120	0%	S
Nickel	A	mg/L	0.002058	0.002058		0.002	0	0	7.128E-05	0.001	5	103%	80	120	0%	
Selenium	A	mg/L	0.00196	0.00196		0.002	0	0	0.0001532	0.001	5	98%	80	120	0%	
Silver	A	mg/L	0.000063	0.000063		0.0002	0	0	2.959E-05	0.001	1	32%	80	120	0%	S
Strontium	A	mg/L	0.000405	0.000405		0.0005	0	0	1.229E-05	0.001	5	81%	80	120	0%	
Thallium	A	mg/L	0.000462	0.000462		0.0005	0	0	1.434E-05	0.001	5	92%	80	120	0%	
Thorium	A	mg/L	0.005852	0.005852		0.01	0	0	5.767E-05	0.001	5	59%	80	120	0%	S
Tin	A	mg/L	0.000823	0.000823		0.001	0	0	5.199E-05	0.001	5	82%	80	120	0%	
Titanium	A	mg/L	0.00094	0.00094		0.001	0	0	0.0001736	0.001	5	94%	80	120	0%	
Uranium	A	mg/L	0.000389	0.000389		0.0005	0	0	1.332E-05	0.0003	5	78%	80	120	0%	S
Vanadium	A	mg/L	0.001849	0.001849		0.002	0	0	7.351E-05	0.001	5	92%	80	120	0%	
Zinc	A	mg/L	0.004978	0.004978		0.005	0	0	0.0002495	0.001	5	100%	80	120	0%	
Iron, Ferrous	C	mg/L	0.008297	0.008297		0	0	0	0.000175	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685188	LFB	ICPMS-6020-W-	LFB		2/6/2018 3:30:00	1.02	R294337		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685188	LFB	ICPMS-6020-W-	LFB		2/6/2018 3:30:00	1.02	R294337		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04996	0.0509592		0.05	0	0	0.0002906	0.001	5	102%	85	115	0%	
Antimony	A	mg/L	0.04908	0.0500616		0.05	0	0	3.108E-05	0.001	5	100%	85	115	0%	
Arsenic	A	mg/L	0.05064	0.0516528		0.05	0	0	6.762E-05	0.001	5	103%	85	115	0%	
Barium	A	mg/L	0.05034	0.0513468		0.05	0	0	6.566E-05	0.001	5	103%	85	115	0%	
Beryllium	A	mg/L	0.05015	0.051153		0.05	0	0	9.149E-06	0.001	5	102%	85	115	0%	
Boron	A	mg/L	0.04781	0.0487662		0.05	0	0	0.0014382	0.0014382	5	98%	85	115	0%	
Cadmium	A	mg/L	0.04984	0.0508368		0.05	0	0	5.748E-05	0.001	5	102%	85	115	0%	
Cerium	A	mg/L	0.05026	0.0512652		0	0.000009	0		0.001		0%	0	0	0%	
Chromium	A	mg/L	0.05027	0.0512754		0.05	0	0	5.688E-05	0.001	5	103%	85	115	0%	
Cobalt	A	mg/L	0.05017	0.0511734		0.05	0	0	3.982E-05	0.001	5	102%	85	115	0%	
Copper	A	mg/L	0.04998	0.0509796		0.05	0	0	7.835E-05	0.001	5	102%	85	115	0%	
Iron	A	mg/L	5.081	5.18262		5.05	0.002079	0	0.0001785	0.001	10	103%	85	115	0%	
Lead	A	mg/L	0.05111	0.0521322		0.05	0	0	3.015E-05	0.001	5	104%	85	115	0%	
Manganese	A	mg/L	0.05058	0.0515916		0.05	0	0	3.722E-05	0.001	5	103%	85	115	0%	
Mercury	A	mg/L	0.00109	0.0011118		0.001	0	0	1.315E-05	0.001	0.5	111%	85	115	0%	
Molybdenum	A	mg/L	0.05073	0.0517446		0.05	0	0	2.348E-05	0.001	5	103%	85	115	0%	
Nickel	A	mg/L	0.04988	0.0508776		0.05	0	0	7.271E-05	0.001	5	102%	85	115	0%	
Selenium	A	mg/L	0.04931	0.0502962		0.05	0	0	0.0001563	0.001	5	101%	85	115	0%	
Silver	A	mg/L	0.0194	0.019788		0.02	0	0	3.018E-05	0.001	1	99%	85	115	0%	
Strontium	A	mg/L	0.05048	0.0514896		0.05	0	0	1.254E-05	0.001	5	103%	85	115	0%	
Thallium	A	mg/L	0.04961	0.0506022		0.05	0	0	1.463E-05	0.001	5	101%	85	115	0%	
Thorium	A	mg/L	0.05263	0.0536826		0.05	0	0	5.882E-05	0.001	5	107%	85	115	0%	
Tin	A	mg/L	0.05016	0.0511632		0.05	0	0	5.303E-05	0.001	5	102%	85	115	0%	
Titanium	A	mg/L	0.05643	0.0575586		0.05	0	0	0.0001771	0.001	5	115%	85	115	0%	
Uranium	A	mg/L	0.05142	0.0524484		0.05	0	0	1.359E-05	0.0003	5	105%	85	115	0%	
Vanadium	A	mg/L	0.05115	0.052173		0.05	0	0	7.498E-05	0.001	5	104%	85	115	0%	
Zinc	A	mg/L	0.04967	0.0506634		0.05	0.000778	0	0.0002545	0.001	5	100%	85	115	0%	
Iron, Ferrous	C	mg/L	5.081	5.18262		0	0.002079	0	0.0001785	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685189	ICSA	ICPMS-6020-W-	ICSA		2/6/2018 3:35:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685189	ICSA	ICPMS-6020-W-	ICSA		2/6/2018 3:35:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	38.38	38.38		40	0	0	0.0002849	0.001	5	96%	70	130	0%	
Antimony	A	mg/L	0.00014	0.00014		0	0	0	3.047E-05	0.001	5	0%			0%	
Arsenic	A	mg/L	0.00006	0.00006		0	0	0	6.629E-05	0.001	5	0%			0%	
Barium	A	mg/L	0.00003	0.00003		0	0	0	6.437E-05	0.001	5	0%			0%	
Beryllium	A	mg/L	-0.00013	-0.00013		0	0	0	8.97E-06	0.001	5	0%			0%	
Boron	A	mg/L	0.0477	0.0477		0	0	0	0.00141	0.00141	5	0%			0%	
Cadmium	A	mg/L	-0.00012	-0.00012		0	0	0	5.635E-05	0.001	5	0%			0%	
Cerium	A	mg/L	0.00003	0.00003		0	0	0		0.001		0%			0%	
Chromium	A	mg/L	0.00184	0.00184		0	0	0	5.576E-05	0.001	5	0%			0%	
Cobalt	A	mg/L	0.00004	0.00004		0	0	0	3.904E-05	0.001	5	0%			0%	
Copper	A	mg/L	0.00126	0.00126		0	0	0	7.681E-05	0.001	5	0%			0%	
Iron	A	mg/L	88.81	88.81		100	0	0	0.000175	0.001	10	89%	70	130	0%	
Lead	A	mg/L	0.00031	0.00031		0	0	0	2.956E-05	0.001	5	0%			0%	
Manganese	A	mg/L	0.00024	0.00024		0	0	0	3.649E-05	0.001	5	0%			0%	
Mercury	A	mg/L	0.00003	0.00003		0	0	0	1.289E-05	0.001	0.5	0%			0%	
Molybdenum	A	mg/L	0.8207	0.8207		0.8	0	0	2.302E-05	0.001	5	103%	70	130	0%	
Nickel	A	mg/L	0.00123	0.00123		0	0	0	7.128E-05	0.001	5	0%			0%	
Selenium	A	mg/L	-0.00013	-0.00013		0	0	0	0.0001532	0.001	5	0%			0%	
Silver	A	mg/L	0.00038	0.00038		0	0	0	2.959E-05	0.001	1	0%			0%	
Strontium	A	mg/L	0.00042	0.00042		0	0	0	1.229E-05	0.001	5	0%			0%	
Thallium	A	mg/L	-0.00003	-0.00003		0	0	0	1.434E-05	0.001	5	0%			0%	
Thorium	A	mg/L	0.00512	0.00512		0	0	0	5.767E-05	0.001	5	0%			0%	
Tin	A	mg/L	0.00017	0.00017		0	0	0	5.199E-05	0.001	5	0%			0%	
Titanium	A	mg/L	0.7912	0.7912		0.8	0	0	0.0001736	0.001	5	99%			0%	
Uranium	A	mg/L	-0.00009	-0.00009		0	0	0	1.332E-05	0.0003	5	0%			0%	
Vanadium	A	mg/L	0.00006	0.00006		0	0	0	7.351E-05	0.001	5	0%			0%	
Zinc	A	mg/L	0.00214	0.00214		0	0	0	0.0002495	0.001	5	0%			0%	
Iron, Ferrous	C	mg/L	88.81	88.81		0	0	0	0.000175	0.001	5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685190	ICSAB	ICPMS-6020-W-	ICSAB		2/6/2018 3:38:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685190	ICSAB	ICPMS-6020-W-	ICSAB		2/6/2018 3:38:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	37.62	37.62		40	0	0	0.0002849	0.001	5	94%	70	130	0%	
Antimony	A	mg/L	0.00003	0.00003		0	0	0	3.047E-05	0.001	5	0%			0%	
Arsenic	A	mg/L	0.00997	0.00997		0.01	0	0	6.629E-05	0.001	5	100%	70	130	0%	
Barium	A	mg/L	0	0		0	0	0	6.437E-05	0.001	5	0%			0%	
Beryllium	A	mg/L	-0.00012	-0.00012		0	0	0	8.97E-06	0.001	5	0%			0%	
Boron	A	mg/L	0.00098	0.00098		0	0	0	0.00141	0.00141	5	0%			0%	
Cadmium	A	mg/L	0.0097	0.0097		0.01	0	0	5.635E-05	0.001	5	97%	70	130	0%	
Cerium	A	mg/L	0.00004	0.00004		0	0	0		0.001		0%			0%	
Chromium	A	mg/L	0.02022	0.02022		0.02	0	0	5.576E-05	0.001	5	101%	70	130	0%	
Cobalt	A	mg/L	0.0193	0.0193		0.02	0	0	3.904E-05	0.001	5	97%	70	130	0%	
Copper	A	mg/L	0.02009	0.02009		0.02	0	0	7.681E-05	0.001	5	100%	70	130	0%	
Iron	A	mg/L	86.69	86.69		100	0	0	0.000175	0.001	10	87%	70	130	0%	
Lead	A	mg/L	0.00031	0.00031		0	0	0	2.956E-05	0.001	5	0%			0%	
Manganese	A	mg/L	0.01926	0.01926		0.02	0	0	3.649E-05	0.001	5	96%	70	130	0%	
Mercury	A	mg/L	0.00001	0.00001		0	0	0	1.289E-05	0.001	0.5	0%			0%	
Molybdenum	A	mg/L	0.8124	0.8124		0.8	0	0	2.302E-05	0.001	5	102%	70	130	0%	
Nickel	A	mg/L	0.02065	0.02065		0.02	0	0	7.128E-05	0.001	5	103%	70	130	0%	
Selenium	A	mg/L	0.00904	0.00904		0.01	0	0	0.0001532	0.001	5	90%	70	130	0%	
Silver	A	mg/L	0.0204	0.0204		0.02	0	0	2.959E-05	0.001	1	102%	70	130	0%	
Strontium	A	mg/L	0.00038	0.00038		0	0	0	1.229E-05	0.001	5	0%			0%	
Thallium	A	mg/L	-0.00008	-0.00008		0	0	0	1.434E-05	0.001	5	0%			0%	
Thorium	A	mg/L	0.0019	0.0019		0	0	0	5.767E-05	0.001	5	0%			0%	
Tin	A	mg/L	-0.00005	-0.00005		0	0	0	5.199E-05	0.001	5	0%			0%	
Titanium	A	mg/L	0.7744	0.7744		0.8	0	0	0.0001736	0.001	5	97%	70	130	0%	
Uranium	A	mg/L	-0.00009	-0.00009		0	0	0	1.332E-05	0.0003	5	0%			0%	
Vanadium	A	mg/L	0.0191	0.0191		0.02	0	0	7.351E-05	0.001	5	96%	70	130	0%	
Zinc	A	mg/L	0.01114	0.01114		0.01	0	0	0.0002495	0.001	5	111%	70	130	0%	
Iron, Ferrous	C	mg/L	86.69	86.69		0	0	0	0.000175	0.001	5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685191	B18020204-001	200.7.8-W-DW	SAMP		2/6/2018 4:01:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685191	B18020204-001	200.7.8-W-DW	SAMP		2/6/2018 4:01:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000359	0.000359		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000598	0.000598		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	J
Barium	A	mg/L	0.1686	0.1686		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000205	0.000205		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	-0.000225	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.01355	0.01355		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	
Cobalt	A	mg/L	0.000232	0.000232		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	J
Copper	A	mg/L	0.007152	0.007152		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Mercury	A	mg/L	0.000019	0.000019		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.001188	0.001188		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000388	0.000388		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Silver	A	mg/L	0.000536	0.000536		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	J
Strontium	A	mg/L	0.1878	0.1878		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Thallium	A	mg/L	0.000387	0.000387		0	0	0	1.434E-05	0.0005	18	0%	0	0	0%	J
Tin	A	mg/L	0.000118	0.000118		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000795	0.000795		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Vanadium	A	mg/L	0.003806	0.003806		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.006413	0.006413		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685192	B18020204-001	200.7.8-W-DW	MS		2/6/2018 4:04:00	1.02	R294337		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.05332	0.0543864		0.05	0.004426	0	0.0002906	0.03	4.5	100%	70	130	0%	
Antimony	A	mg/L	0.05381	0.0548862		0.05	0.000359	0	3.108E-05	0.001	18	109%	70	130	0%	
Arsenic	A	mg/L	0.05656	0.0576912		0.05	0.000598	0	6.762E-05	0.001	18	114%	70	130	0%	
Barium	A	mg/L	0.2168	0.221136		0.05	0.1686	0	6.566E-05	0.05	18	105%	70	130	0%	
Beryllium	A	mg/L	0.04895	0.049929		0.05	0.000205	0	9.149E-06	0.001	4.5	99%	70	130	0%	
Boron	A	mg/L	0.2678	0.273156		0.05	0.2274	0	0.0014382	0.05	4.5		70	130	0%	A
Cadmium	A	mg/L	0.05043	0.0514386		0.05	0	0	1.497E-05	0.001	18	103%	70	130	0%	
Chromium	A	mg/L	0.06123	0.0624546		0.05	0.01355	0	5.688E-05	0.005	18	98%	70	130	0%	
Cobalt	A	mg/L	0.05045	0.051459		0.05	0.000232	0	3.982E-05	0.005	18	102%	70	130	0%	
Copper	A	mg/L	0.05701	0.0581502		0.05	0.007152	0	7.835E-05	0.005	4.5	102%	70	130	0%	
Lead	A	mg/L	0.05296	0.0540192		0.05	0.001112	0	3.015E-05	0.001	18	106%	70	130	0%	
Manganese	A	mg/L	0.05275	0.053805		0.05	0.003136	0	3.722E-05	0.001	18	101%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685192	B18020204-001	200.7.8-W-DW	MS		2/6/2018 4:04:00	1.02	R294337		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Mercury	A	mg/L	0.001083	0.00110466		0.001	0.000019	0	1.315E-05	0.0001	0.36	109%	70	130	0%	
Molybdenum	A	mg/L	0.05254	0.0535908		0.05	0.001188	0	2.348E-05	0.005	9	105%	70	130	0%	
Nickel	A	mg/L	0.05009	0.0510918		0.05	0.000388	0	7.271E-05	0.01	4.5	101%	70	130	0%	
Selenium	A	mg/L	0.05875	0.059925		0.05	0.001608	0	0.0001563	0.001	18	117%	70	130	0%	
Silver	A	mg/L	0.02074	0.0211548		0.02	0.000536	0	3.018E-05	0.001	0.1	103%	70	130	0%	
Strontium	A	mg/L	0.2356	0.240312		0.05	0.1878	0	1.254E-05	0.01	18	105%	70	130	0%	
Thallium	A	mg/L	0.04852	0.0494904		0.05	0.000387	0	1.463E-05	0.0005	18	98%	70	130	0%	
Thorium	A	mg/L	0.0585	0.05967		0.05	0.002762	0	5.882E-05	0.005	4.5	114%	70	130	0%	
Thorium 232	A	mg/L	0.0585	0.05967		0.05	0.002762	0	5.882E-05	0.005	4.5	114%	70	130	0%	
Tin	A	mg/L	0.05179	0.0528258		0.05	0.000118	0	5.303E-05	0.05	9	105%	70	130	0%	
Titanium	A	mg/L	0.05526	0.0563652		0.05	0.000795	0	0.0001771	0.005	18	111%	70	130	0%	
Uranium	A	mg/L	0.05368	0.0547536		0.05	0.000281	0	1.359E-05	0.0003	4.5	109%	70	130	0%	
Vanadium	A	mg/L	0.0539	0.054978		0.05	0.003806	0	7.498E-05	0.01	18	102%	70	130	0%	
Zinc	A	mg/L	0.05502	0.0561204		0.05	0.006413	0	0.0002545	0.01	4.5	99%	70	130	0%	
Uranium, Activity	C	pCi/L	35.9656	36.684912		0	0	0	0.0091029	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685193	B18020204-001	200.7.8-W-DW	MSD		2/6/2018 4:06:00	1.02	R294337		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.05443	0.0555186		0.05	0.004426	0.0543864	0.0002906	0.03	4.5	102%	70	130	2%	
Antimony	A	mg/L	0.05263	0.0536826		0.05	0.000359	0.0548862	3.108E-05	0.001	18	107%	70	130	2%	
Arsenic	A	mg/L	0.05601	0.0571302		0.05	0.000598	0.0576912	6.762E-05	0.001	18	113%	70	130	1%	
Barium	A	mg/L	0.2222	0.226644		0.05	0.1686	0.221136	6.566E-05	0.05	18	116%	70	130	2%	
Beryllium	A	mg/L	0.04925	0.050235		0.05	0.000205	0.049929	9.149E-06	0.001	4.5	100%	70	130	1%	
Boron	A	mg/L	0.2746	0.280092		0.05	0.2274	0.273156	0.0014382	0.05	4.5		70	130	3%	A
Cadmium	A	mg/L	0.04881	0.0497862		0.05	0	0.0514386	1.497E-05	0.001	18	100%	70	130	3%	
Chromium	A	mg/L	0.06514	0.0664428		0.05	0.01355	0.0624546	5.688E-05	0.005	18	106%	70	130	6%	
Cobalt	A	mg/L	0.05253	0.0535806		0.05	0.000232	0.051459	3.982E-05	0.005	18	107%	70	130	4%	
Copper	A	mg/L	0.05817	0.0593334		0.05	0.007152	0.0581502	7.835E-05	0.005	4.5	104%	70	130	2%	
Lead	A	mg/L	0.05152	0.0525504		0.05	0.001112	0.0540192	3.015E-05	0.001	18	103%	70	130	3%	
Manganese	A	mg/L	0.0566	0.057732		0.05	0.003136	0.053805	3.722E-05	0.001	18	109%	70	130	7%	
Mercury	A	mg/L	0.001067	0.00108834		0.001	0.000019	0.0011047	1.315E-05	0.0001	0.36	107%	70	130	1%	
Molybdenum	A	mg/L	0.0519	0.052938		0.05	0.001188	0.0535908	2.348E-05	0.005	9	103%	70	130	1%	
Nickel	A	mg/L	0.05228	0.0533256		0.05	0.000388	0.0510918	7.271E-05	0.01	4.5	106%	70	130	4%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685193	B18020204-001	200.7.8-W-DW	MSD		2/6/2018 4:06:00	1.02	R294337		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	0.06019	0.0613938		0.05	0.001608	0.059925	0.0001563	0.001	18	120%	70	130	2%	
Silver	A	mg/L	0.02039	0.0207978		0.02	0.000536	0.0211548	3.018E-05	0.001	0.1	101%	70	130	2%	
Strontium	A	mg/L	0.2452	0.250104		0.05	0.1878	0.240312	1.254E-05	0.01	18	125%	70	130	4%	
Thallium	A	mg/L	0.04781	0.0487662		0.05	0.000387	0.0494904	1.463E-05	0.0005	18	97%	70	130	1%	
Thorium	A	mg/L	0.05552	0.0566304		0.05	0.002762	0.05967	5.882E-05	0.005	4.5	108%	70	130	5%	
Thorium 232	A	mg/L	0.05552	0.0566304		0.05	0.002762	0.05967	5.882E-05	0.005	4.5	108%	70	130	5%	
Tin	A	mg/L	0.05152	0.0525504		0.05	0.000118	0.0528258	5.303E-05	0.05	9	105%	70	130	1%	
Titanium	A	mg/L	0.05745	0.058599		0.05	0.000795	0.0563652	0.0001771	0.005	18	116%	70	130	4%	
Uranium	A	mg/L	0.05261	0.0536622		0.05	0.000281	0.0547536	1.359E-05	0.0003	4.5	107%	70	130	2%	
Vanadium	A	mg/L	0.05721	0.0583542		0.05	0.003806	0.054978	7.498E-05	0.01	18	109%	70	130	6%	
Zinc	A	mg/L	0.05466	0.0557532		0.05	0.006413	0.0561204	0.0002545	0.01	4.5	99%	70	130	1%	
Uranium, Activity	C	pCi/L	35.2487	35.953674		0	0	36.684912	0.0091029	0.201	1000	0%	0	0	2%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685194	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 4:09:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000158	0.000158		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000237	0.000237		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000477	0.000477		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000179	0.000179		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000217	0.000217		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000065	0.000065		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000371	0.000371		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000204	0.000204		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.00028	0.00028		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000062	0.000062		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000328	0.000328		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000346	0.000346		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000595	0.000595		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000228	0.000228		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000274	0.000274		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000457	0.000457		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.00051	0.00051		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685194	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 4:09:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.000482	0.000482		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000521	0.000521		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.00074	0.00074		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000209	0.000209		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000319	0.000319		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000259	0.000259		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685195	B18020221-001	200.7.8-W-DW	SAMP		2/6/2018 4:12:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000494	0.000494		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.005386	0.005386		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	A	mg/L	0.05002	0.05002		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000024	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000028	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.003769	0.003769		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.00001	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.008997	0.008997		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000677	0.000677		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000227	0.000227		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000009	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.006133	0.006133		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.001458	0.001458		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Silver	A	mg/L	0.000129	0.000129		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	J
Strontium	A	mg/L	0.9069	0.9069		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Thallium	A	mg/L	0.000265	0.000265		0	0	0	1.434E-05	0.0005	18	0%	0	0	0%	J
Tin	A	mg/L	0.000276	0.000276		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	J
Titanium	A	mg/L	0.001746	0.001746		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Uranium	A	mg/L	0.003819	0.003819		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.002591	0.002591		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.01574	0.01574		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	
Uranium, Activity	C	pCi/L	2.55873	2.55873		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685196	B18020221-002	200.7.8-W-DW	SAMP		2/6/2018 4:14:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000326	0.000326		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.003184	0.003184		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	A	mg/L	0.04319	0.04319		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.00004	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000025	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.003996	0.003996		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000056	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.00357	0.00357		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.00042	0.00042		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000052	0.000052		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000006	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.006754	0.006754		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000978	0.000978		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Silver	A	mg/L	-0.000004	0		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	
Strontium	A	mg/L	1.104	1.104		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Thallium	A	mg/L	0.000073	0.000073		0	0	0	1.434E-05	0.0005	18	0%	0	0	0%	J
Tin	A	mg/L	-0.000034	0		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	
Titanium	A	mg/L	0.001561	0.001561		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Uranium	A	mg/L	0.003632	0.003632		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.001376	0.001376		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.006663	0.006663		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J
Uranium, Activity	C	pCi/L	2.43344	2.43344		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685197	B18020265-001	200.7.8-W-DW	SAMP		2/6/2018 4:17:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000376	0.000376		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.007267	0.007267		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	A	mg/L	0.03831	0.03831		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000078	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000982	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.00142	0.00142		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000072	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.00701	0.00701		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685197	B18020265-001	200.7.8-W-DW	SAMP		2/6/2018 4:17:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	0.000067	0.000067		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000007	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.001282	0.001282		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000326	0.000326		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000428	0.000428		0	0	0	0.0001532	0.001	18	0%	0	0	0%	J
Strontium	A	mg/L	0.2425	0.2425		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Thallium	A	mg/L	0.000119	0.000119		0	0	0	1.434E-05	0.0005	18	0%	0	0	0%	J
Tin	A	mg/L	-0.000161	0		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	
Titanium	A	mg/L	0.000823	0.000823		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000137	0.000137		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.00103	0.00103		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.001962	0.001962		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J
Uranium, Activity	C	pCi/L	0.09179	0.09179		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685198	B18020205-001	ICPMS-200.8-W	SAMP		2/6/2018 4:19:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	mg/L	-0.00005	0		0	0	0	0.000014	0.001	4.5	0%	0	0	0%	
Uranium, Activity	C	pCi/L	-0.0335	0		0	0	0	0.00938	0.67	13400	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685199	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 4:22:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000048	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000023	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000148	0.000148		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000063	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000021	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000014	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000031	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000003	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685199	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 4:22:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	mg/L	0.01367	0.01367		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.000012	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000015	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000028	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000016	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000018	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000012	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.00008	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000047	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000506	0.000506		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000088	0.000088		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	-0.000164	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000089	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000025	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000006	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000101	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685200	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 4:25:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000065	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000024	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000066	0.000066		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.00006	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000019	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000013	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000032	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000039	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000007	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01598	0.01598		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.000013	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000011	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000001	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000009	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685200	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 4:25:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	A	mg/L	-0.000046	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000003	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000151	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000051	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000367	0.000367		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000067	0.000067		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	-0.000225	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000005	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000028	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000001	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.00009	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685201	CCV	ICPMS-200.8-W	SAMP		2/6/2018 4:27:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.005881	0.005881		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.006024	0.006024		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.006099	0.006099		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.006238	0.006238		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.005855	0.005855		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.005859	0.005859		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.005175	0.005175		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.005929	0.005929		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.005802	0.005802		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.005904	0.005904		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.006467	0.006467		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.005918	0.005918		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000102	0.000102		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.005219	0.005219		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.005926	0.005926		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.00552	0.00552		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.002036	0.002036		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.006063	0.006063		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.006255	0.006255		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685201	CCV	ICPMS-200.8-W	SAMP		2/6/2018 4:27:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.004637	0.004637		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.005568	0.005568		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.006302	0.006302		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.00558	0.00558		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.005919	0.005919		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685202	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 4:30:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.00005	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000037	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000024	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000078	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000002	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000012	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.00001	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000068	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000001	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01177	0.01177		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.000006	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000014	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000015	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000012	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000096	0.000096		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	-0.000019	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000087	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000044	0.000044		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000171	0.000171		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000025	0.000025		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000049	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000025	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000023	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000021	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000033	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685202	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 4:30:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685203	CCB	ICPMS-200.8-W	SAMP		2/6/2018 4:33:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cerium	A	mg/L	-0.00002	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Copper	A	mg/L	-0.000097	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	-0.000018	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Mercury	A	mg/L	-0.000017	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Selenium	A	mg/L	-0.000159	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000044	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Titanium	B	mg/L	-0.000162	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Vanadium	B	mg/L	-0.000033	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685204	CCV	ICPMS-200.8-W	CCV		2/6/2018 4:36:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.05223	0.05223		0.05	0	0	0.0002849	0.1	4.5	104%	90	110	0%	
Antimony	A	mg/L	0.05077	0.05077		0.05	0	0	3.047E-05	0.05	18	102%	90	110	0%	
Arsenic	A	mg/L	0.05055	0.05055		0.05	0	0	6.629E-05	0.005	18	101%	90	110	0%	
Barium	A	mg/L	0.05147	0.05147		0.05	0	0	6.437E-05	0.1	18	103%	90	110	0%	
Beryllium	A	mg/L	0.05195	0.05195		0.05	0	0	8.97E-06	0.001	4.5	104%	90	110	0%	
Boron	A	mg/L	0.05147	0.05147		0.05	0	0	0.00141	0.1	4.5	103%	90	110	0%	
Cadmium	A	mg/L	0.0512	0.0512		0.05	0	0	1.468E-05	0.001	18	102%	90	110	0%	
Cerium	A	mg/L	0.04999	0.04999		0.05	0	0	2.257E-05	0.001	4.5	100%	90	110	0%	
Chromium	A	mg/L	0.05137	0.05137		0.05	0	0	5.576E-05	0.01	18	103%	90	110	0%	
Cobalt	A	mg/L	0.0509	0.0509		0.05	0	0	3.904E-05	0.01	18	102%	90	110	0%	
Copper	A	mg/L	0.05034	0.05034		0.05	0	0	7.681E-05	0.01	4.5	101%	90	110	0%	
Iron	A	mg/L	1.352	1.352		1.3	0	0	0.000175	0.02	4.5	104%	90	110	0%	
Lanthanum	A	mg/L	0.05132	0.05132		0.05	0	0	0.0000111	0.001	4.5	103%	90	110	0%	
Lead	A	mg/L	0.05128	0.05128		0.05	0	0	2.956E-05	0.01	18	103%	90	110	0%	
Manganese	A	mg/L	0.05186	0.05186		0.05	0	0	3.649E-05	0.01	18	104%	90	110	0%	
Mercury	A	mg/L	0.00104	0.00104		0.001	0	0	1.289E-05	0.001	0.36	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685204	CCV	ICPMS-200.8-W CCV			2/6/2018 4:36:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	A	mg/L	0.05003	0.05003		0.05	0	0	2.302E-05	0.005	9	100%	90	110	0%	
Nickel	A	mg/L	0.05108	0.05108		0.05	0	0	7.128E-05	0.01	4.5	102%	90	110	0%	
Selenium	A	mg/L	0.05118	0.05118		0.05	0	0	0.0001532	0.005	18	102%	90	110	0%	
Silver	A	mg/L	0.02043	0.02043		0.02	0	0	2.959E-05	0.005	1.8	102%	90	110	0%	
Strontium	A	mg/L	0.05035	0.05035		0.05	0	0	1.229E-05	0.1	18	101%	90	110	0%	
Thallium	A	mg/L	0.04972	0.04972		0.05	0	0	1.434E-05	0.1	18	99%	90	110	0%	
Thorium	A	mg/L	0.04823	0.04823		0.05	0	0	5.767E-05	0.001	4.5	96%	90	110	0%	
Thorium 232	A	mg/L	0.04823	0.04823		0.05	0	0	5.767E-05	0.01	4.5	96%	90	110	0%	
Tin	A	mg/L	0.052	0.052		0.05	0	0	5.199E-05	0.1	9	104%	90	110	0%	
Titanium	A	mg/L	0.05074	0.05074		0.05	0	0	0.0001736	0.01	18	101%	90	110	0%	
Uranium	A	mg/L	0.05063	0.05063		0.05	0	0	1.332E-05	0.001	4.5	101%	90	110	0%	
Vanadium	A	mg/L	0.05105	0.05105		0.05	0	0	7.351E-05	0.1	18	102%	90	110	0%	
Zinc	A	mg/L	0.0499	0.0499		0.05	0	0	0.0002495	0.01	4.5	100%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685205	Rinse	ICPMS-200.8-W SAMP			2/6/2018 4:39:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.000209	0		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000029	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.00002	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000005	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000083	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000748	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.00001	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000021	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000059	0.000059		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000082	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000072	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01289	0.01289		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000027	0.000027		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	-0.000009	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.00004	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000008	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000118	0.000118		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685205	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 4:39:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/L	0.000005	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000125	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000179	0.000179		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000066	0.000066		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000029	0.000029		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000242	0.000242		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000242	0.000242		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000293	0.000293		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	-0.000021	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000025	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000035	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000052	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685206	CCB	ICPMS-200.8-W	CCB		2/6/2018 4:41:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.000044	0.000044		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000085	-0.000085		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000111	-0.000111		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000085	-0.000085		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000142	-0.000142		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000902	-0.000902		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000075	-0.000075		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000006	-0.000006		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000037	-0.000037		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.00014	-0.00014		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000097	-0.000097		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01467	0.01467		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	-0.000004	-0.000004		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000096	-0.000096		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000114	-0.000114		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000012	-0.000012		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000065	-0.000065		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.00007	-0.00007		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685206	CCB	ICPMS-200.8-W	CCB		2/6/2018 4:41:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	0.00002	0.00002		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000013	-0.000013		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000021	-0.000021		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000072	-0.000072		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000045	-0.000045		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000045	-0.000045		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000133	-0.000133		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000162	-0.000162		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000115	-0.000115		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000038	-0.000038		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.00013	-0.00013		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685207	MB-118183	6010.20-S	MBLK		2/6/2018 4:44:00	2	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.00374	0		0	0	0	0.6864	5	5	0%	0	0	0%	
Antimony	A	mg/kg	0.000169	0.0169		0	0	0	0.011164	1	5	0%	0	0	0%	
Arsenic	A	mg/kg	-0.000546	0		0	0	0	0.03342	1	5	0%	0	0	0%	
Barium	A	mg/kg	0.000041	0		0	0	0	0.013238	1	5	0%	0	0	0%	
Beryllium	A	mg/kg	-0.000122	0		0	0	0	0.003436	1	5	0%	0	0	0%	
Boron	A	mg/kg	0.000266	0		0	0	0	0.0848	1	5	0%	0	0	0%	
Cadmium	A	mg/kg	-0.000312	0		0	0	0	0.00689	1	5	0%	0	0	0%	
Chromium	A	mg/kg	0.00635	0.635		0	0	0	0.11824	1	5	0%	0	0	0%	
Cobalt	A	mg/kg	-0.000185	0		0	0	0	0.003824	1	5	0%	0	0	0%	
Copper	A	mg/kg	0.000481	0		0	0	0	0.06682	1	5	0%	0	0	0%	
Lead	A	mg/kg	0.000296	0		0	0	0	0.04464	1	5	0%	0	0	0%	
Manganese	A	mg/kg	0.000369	0		0	0	0	0.0479	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg	0.000085	0		0	0	0	0.009372	1	5	0%	0	0	0%	
Nickel	A	mg/kg	0.000243	0.0243		0	0	0	0.017344	1	5	0%	0	0	0%	
Selenium	A	mg/kg	0.000003	0		0	0	0	0.03788	1	5	0%	0	0	0%	
Silver	A	mg/kg	0.00044	0.044		0	0	0	0.010724	1	1	0%	0	0	0%	
Strontium	A	mg/kg	0.000023	0		0	0	0	0.005114	1	5	0%	0	0	0%	
Thallium	A	mg/kg	0.000004	0		0	0	0	0.004758	1	5	0%	0	0	0%	
Thorium	A	mg/kg	0.00587	0.587		0	0	0	0.03388	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685207	MB-118183	6010.20-S	MBLK		2/6/2018 4:44:00	2	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thorium 232	A	mg/kg	0.00587	0.587		0	0	0	0.03388	1	5	0%	0	0	0%	
Tin	A	mg/kg	0.01274	1.274		0	0	0	0.08568	1	5	0%	0	0	0%	
Titanium	A	mg/kg	0.000414	0.0414		0	0	0	0.0391	1	5	0%	0	0	0%	
Uranium	A	mg/kg	-0.000086	0		0	0	0	0.001281	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	0.000075	0		0	0	0	0.1674	1	5	0%	0	0	0%	
Zinc	A	mg/kg	0.001372	0		0	0	0	0.2444	1	5	0%	0	0	0%	
Aluminum as Al2O3	C	mg/kg	0.0070686	0		0	0	0	1.297296	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	-0.0000273	0		0	0	0	0.001671	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	0.00004592	0		0	0	0	0.0148266	1.12	100000	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	-0.0000156	0		0	0	0	0.0003445	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.0003175	0.03175		0	0	0	0.005912	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.0000148	0		0	0	0	0.002232	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	0.00046863	0		0	0	0	0.060833	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.00000015	0		0	0	0	0.001894	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.000022	0.0022		0	0	0	0.0005362	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	0.00002714	0		0	0	0	0.0060345	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	0.00063983	0.063983		0	0	0	0.0036929	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.00069138	0.069138		0	0	0	0.065297	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	-5.822E-05	0		0	0	0	0.0008672	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685208	B18012204-001	6010.20-S	SAMP		2/6/2018 4:47:00	5	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.004708	0		0	0	0	3.3081048	5	5	0%	0	0	0%	
Antimony	A	mg/kg	0.000028	0		0	0	0	0.0538049	1	5	0%	0	0	0%	
Arsenic	A	mg/kg	-0.00055	0		0	0	0	0.1610677	1	5	0%	0	0	0%	
Barium	A	mg/kg	0.000019	0		0	0	0	0.0638005	1	5	0%	0	0	0%	
Beryllium	A	mg/kg	-0.000126	0		0	0	0	0.0165598	1	5	0%	0	0	0%	
Boron	A	mg/kg	-0.000532	0		0	0	0	0.4086936	1	5	0%	0	0	0%	
Cadmium	A	mg/kg	0.000004	0		0	0	0	0.0332064	1	5	0%	0	0	0%	
Chromium	A	mg/kg	0.004196	2.0222622		0	0	0	0.5698577	1	5	0%	0	0	0%	
Cobalt	A	mg/kg	-0.000208	0		0	0	0	0.0184298	1	5	0%	0	0	0%	
Copper	A	mg/kg	0.000479	0		0	0	0	0.322039	1	5	0%	0	0	0%	
Lead	A	mg/kg	0.000624	0.3007368		0	0	0	0.2151425	1	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685208	B18012204-001	6010.20-S	SAMP		2/6/2018 4:47:00	5	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	mg/kg	0.000073	0		0	0	0	0.2308541	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg	-0.000083	0		0	0	0	0.0451684	1	5	0%	0	0	0%	
Nickel	A	mg/kg	0.002929	1.41163155		0	0	0	0.0835894	1	5	0%	0	0	0%	
Selenium	A	mg/kg	0.000115	0		0	0	0	0.1825627	1	5	0%	0	0	0%	
Silver	A	mg/kg	0.000002	0		0	0	0	0.0516843	1	1	0%	0	0	0%	
Strontium	A	mg/kg	0.000004	0		0	0	0	0.0246469	1	5	0%	0	0	0%	
Thallium	A	mg/kg	-0.000111	0		0	0	0	0.0229312	1	5	0%	0	0	0%	
Thorium	A	mg/kg	0.000909	0.43809255		0	0	0	0.1632847	1	5	0%	0	0	0%	J
Thorium 232	A	mg/kg	0.000909	0.43809255		0	0	0	0.1632847	1	5	0%	0	0	0%	J
Titanium	A	mg/kg	0.000748	0.3604986		0	0	0	0.1884425	1	5	0%	0	0	0%	J
Uranium	A	mg/kg	-0.000064	0		0	0	0	0.0061738	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	0.0232	11.18124		0	0	0	0.8067843	1	5	0%	0	0	0%	
Zinc	B	mg/kg	0.0012	0		0	0	0	1.1778858	1.1778858	5	0%	0	0	0%	
Aluminum as Al2O3	C	mg/kg	0.00889812	0		0	0	0	6.2523181	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	-0.0000275	0		0	0	0	0.0080534	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	0.00002128	0		0	0	0	0.0714566	1.12	100000	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.0000002	0		0	0	0	0.0016603	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.0002098	0.10111311		0	0	0	0.0284929	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.0000312	0.01503684		0	0	0	0.0107571	0.05	0	0%	0	0	0%	J
Manganese as MnO	C	mg/kg	0.00009271	0		0	0	0	0.2931846	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.00000575	0		0	0	0	0.0091281	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.0000001	0		0	0	0	0.0025842	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	0.00000472	0		0	0	0	0.0290834	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	9.9081E-05	0.04775209		0	0	0	0.0177980	0.109	100000	0%	0	0	0%	J
Titanium as TiO2	C	mg/kg	0.00124916	0.60203266		0	0	0	0.3146989	1.67	100000	0%	0	0	0%	J
Uranium, Activity	C	pCi/g	-4.333E-05	0		0	0	0	0.0041796	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685209	B18012205-001	6010.20-S	SAMP		2/6/2018 4:49:00	5	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.004806	0		0	0	0	3.3561528	5	5	0%	0	0	0%	
Antimony	A	mg/kg	-0.000033	0		0	0	0	0.0545864	1	5	0%	0	0	0%	
Arsenic	A	mg/kg	-0.000293	0		0	0	0	0.1634071	1	5	0%	0	0	0%	
Barium	A	mg/kg	-0.000014	0		0	0	0	0.0647272	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685209	B18012205-001	6010.20-S	SAMP		2/6/2018 4:49:00	5	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/kg	-0.000126	0		0	0	0	0.0168003	1	5	0%	0	0	0%	
Boron	A	mg/kg	-0.001127	0		0	0	0	0.4146296	1	5	0%	0	0	0%	
Cadmium	A	mg/kg	-0.000001	0		0	0	0	0.0336887	1	5	0%	0	0	0%	
Chromium	A	mg/kg	0.002463	1.20428385		0	0	0	0.5781345	1	5	0%	0	0	0%	
Cobalt	A	mg/kg	-0.000182	0		0	0	0	0.0186974	1	5	0%	0	0	0%	
Copper	A	mg/kg	0.000821	0.40142795		0	0	0	0.3267164	1	5	0%	0	0	0%	J
Lead	A	mg/kg	0.000003	0		0	0	0	0.2182673	1	5	0%	0	0	0%	
Manganese	A	mg/kg	0.000214	0		0	0	0	0.2342071	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg	-0.000047	0		0	0	0	0.0458244	1	5	0%	0	0	0%	
Nickel	A	mg/kg	0.007075	3.45932125		0	0	0	0.0848035	1	5	0%	0	0	0%	
Selenium	A	mg/kg	0.000003	0		0	0	0	0.1852143	1	5	0%	0	0	0%	
Silver	A	mg/kg	-0.000042	0		0	0	0	0.052435	1	1	0%	0	0	0%	
Strontium	A	mg/kg	0.000018	0		0	0	0	0.0250049	1	5	0%	0	0	0%	
Thallium	A	mg/kg	-0.000139	0		0	0	0	0.0232642	1	5	0%	0	0	0%	
Thorium	A	mg/kg	0.000196	0		0	0	0	0.1656563	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg	0.000196	0		0	0	0	0.1656563	1	5	0%	0	0	0%	
Tin	A	mg/kg	0.001707	0.83463765		0	0	0	0.4189324	1	5	0%	0	0	0%	J
Titanium	A	mg/kg	0.00022	0		0	0	0	0.1911795	1	5	0%	0	0	0%	
Uranium	A	mg/kg	-0.00011	0		0	0	0	0.0062634	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	0.06721	32.8623295		0	0	0	0.8185023	1	5	0%	0	0	0%	
Zinc	B	mg/kg	0.00341	1.6673195		0	0	0	1.1949938	1.1949938	5	0%	0	0	0%	
Aluminum as Al2O3	C	mg/kg	0.00908334	0		0	0	0	6.3431288	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	-1.465E-05	0		0	0	0	0.0081704	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	-1.568E-05	0		0	0	0	0.0724945	1.12	100000	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	-5E-08	0		0	0	0	0.0016844	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.00012315	0.06021419		0	0	0	0.0289067	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.00000015	0		0	0	0	0.0109134	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	0.00027178	0		0	0	0	0.297443	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.00000015	0		0	0	0	0.0092607	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	-0.0000021	0		0	0	0	0.0026217	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	0.00002124	0		0	0	0	0.0295058	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	2.1364E-05	0		0	0	0	0.0180565	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.0003674	0		0	0	0	0.3192697	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	-7.447E-05	0		0	0	0	0.0042404	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685210	B18012206-001	6010.20-S	SAMP		2/6/2018 4:52:00	5	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.003919	0		0	0	0	3.20034	5	5	0%	0	0	0%	
Antimony	A	mg/kg	0.000002	0		0	0	0	0.0520522	1	5	0%	0	0	0%	
Arsenic	A	mg/kg	-0.00051	0		0	0	0	0.1558208	1	5	0%	0	0	0%	
Barium	A	mg/kg	-0.000005	0		0	0	0	0.0617222	1	5	0%	0	0	0%	
Beryllium	A	mg/kg	-0.000128	0		0	0	0	0.0160204	1	5	0%	0	0	0%	
Boron	A	mg/kg	-0.00088	0		0	0	0	0.39538	1	5	0%	0	0	0%	
Cadmium	A	mg/kg	-0.000057	0		0	0	0	0.0321246	1	5	0%	0	0	0%	
Chromium	A	mg/kg	0.005215	2.43149375		0	0	0	0.551294	1	5	0%	0	0	0%	
Cobalt	A	mg/kg	-0.000043	0		0	0	0	0.0178294	1	5	0%	0	0	0%	
Copper	A	mg/kg	0.001214	0.5660275		0	0	0	0.3115483	1	5	0%	0	0	0%	J
Lead	A	mg/kg	0.000049	0		0	0	0	0.208134	1	5	0%	0	0	0%	
Manganese	A	mg/kg	0.00034	0		0	0	0	0.2233338	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg	-0.000101	0		0	0	0	0.043697	1	5	0%	0	0	0%	
Nickel	A	mg/kg	0.004437	2.06875125		0	0	0	0.0808664	1	5	0%	0	0	0%	
Selenium	A	mg/kg	0.000101	0		0	0	0	0.1766155	1	5	0%	0	0	0%	
Silver	A	mg/kg	-0.000043	0		0	0	0	0.0500007	1	1	0%	0	0	0%	
Strontium	A	mg/kg	0.000014	0		0	0	0	0.0238440	1	5	0%	0	0	0%	
Thallium	A	mg/kg	-0.000139	0		0	0	0	0.0221842	1	5	0%	0	0	0%	
Thorium	A	mg/kg	0.000404	0.188365		0	0	0	0.1579655	1	5	0%	0	0	0%	J
Thorium 232	A	mg/kg	0.000404	0.188365		0	0	0	0.1579655	1	5	0%	0	0	0%	J
Titanium	A	mg/kg	0.000739	0.34455875		0	0	0	0.1823038	1	5	0%	0	0	0%	J
Uranium	A	mg/kg	-0.0001	0		0	0	0	0.0059727	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	0.001337	0		0	0	0	0.7805025	1	5	0%	0	0	0%	
Zinc	B	mg/kg	0.001781	0		0	0	0	1.139515	1.139515	5	0%	0	0	0%	
Aluminum as Al2O3	C	mg/kg	0.00740691	0		0	0	0	6.0486426	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	-0.0000255	0		0	0	0	0.0077910	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	-0.0000056	0		0	0	0	0.0691288	1.12	100000	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	-2.85E-06	0		0	0	0	0.0016062	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.00026075	0.12157469		0	0	0	0.0275647	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.00000245	0		0	0	0	0.0104067	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	0.0004318	0		0	0	0	0.2836339	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.00000505	0		0	0	0	0.0088308	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	-2.15E-06	0		0	0	0	0.0025000	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	0.00001652	0		0	0	0	0.0281359	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	4.4036E-05	0.02053179		0	0	0	0.0172182	0.109	100000	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685210	B18012206-001	6010.20-S	SAMP		2/6/2018 4:52:00	5	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Titanium as TiO2	C	mg/kg	0.00123413	0.57541311		0	0	0	0.3044473	1.67	100000	0%	0	0	0%	J
Uranium, Activity	C	pCi/g	-0.0000677	0		0	0	0	0.0040435	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685211	B18012206-001	6010.20-S	SD		2/6/2018 4:55:00	25	118183	2/5/2018 7:5	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.001315	0		0	0	0	16.0017	16.0017	5	0%				
Antimony	A	mg/kg	-0.000039	0		0	0	0	0.2602608	1	5	0%				
Arsenic	A	mg/kg	-0.000147	0		0	0	0	0.7791038	1	5	0%				
Barium	A	mg/kg	0.000003	0		0	0	0	0.3086109	1	5	0%				
Beryllium	A	mg/kg	-0.000132	0		0	0	0	0.0801018	1	5	0%				
Boron	A	mg/kg	-0.001231	0		0	0	0	1.9769	1.9769	5	0%				
Cadmium	A	mg/kg	-0.000055	0		0	0	0	0.1606231	1	5	0%				
Chromium	A	mg/kg	0.002334	5.4411375		0	0	2.4314938	2.75647	2.75647	5	0%				N
Cobalt	A	mg/kg	-0.000167	0		0	0	0	0.089147	1	5	0%				
Copper	A	mg/kg	0.000244	0		0	0	0.5660275	1.5577413	1.5577413	5	0%				
Lead	A	mg/kg	-0.000044	0		0	0	0	1.04067	1.04067	5	0%				
Manganese	A	mg/kg	-0.000004	0		0	0	0	1.1166688	1.1166688	5	0%				
Molybdenum	A	mg/kg	-0.00014	0		0	0	0	0.2184848	1	5	0%				
Nickel	A	mg/kg	0.000817	1.90463125		0	0	2.0687513	0.404332	1	5	0%				N
Selenium	A	mg/kg	-0.00007	0		0	0	0	0.8830775	1	5	0%				
Silver	A	mg/kg	-0.000049	0		0	0	0	0.2500033	1	1	0%				
Strontium	A	mg/kg	0.000017	0		0	0	0	0.1192201	1	5	0%				
Thallium	A	mg/kg	-0.00014	0		0	0	0	0.1109209	1	5	0%				
Thorium	A	mg/kg	-0.000006	0		0	0	0.188365	0.7898275	1	5	0%				
Thorium 232	A	mg/kg	-0.000006	0		0	0	0.188365	0.7898275	1	5	0%				
Tin	A	mg/kg	0.000767	0		0	0	1.99182	1.997415	1.997415	5	0%				
Titanium	A	mg/kg	0.00004	0		0	0	0.3445588	0.9115188	1	5	0%				
Uranium	A	mg/kg	-0.000117	0		0	0	0	0.0298633	1	5	0%				
Vanadium	A	mg/kg	0.000064	0		0	0	0	3.9025125	3.9025125	5	0%				
Zinc	A	mg/kg	0.002295	0		0	0	0	5.697575	5.697575	5	0%				
Aluminum as Al2O3	C	mg/kg	0.00248535	0		0	0	0	30.243213	30.243213	100000	0%				
Arsenic, TCLP equivalent (calc)	C	mg/L	-7.35E-06	0		0	0	0	0.0389552	0.05	0	0%				
Barium as BaO	C	mg/kg	0.00000336	0		0	0	0	0.3456442	1.12	100000	0%				

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685211	B18012206-001	6010.20-S	SD		2/6/2018 4:55:00	25	118183	2/5/2018 7:5	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium, TCLP equivalent (calc)	C	mg/L	-2.75E-06	0		0	0	0	0.0080312	0.05	0	0%				
Chromium, TCLP equivalent (calc)	C	mg/L	0.0001167	0.27205688		0	0	0.1215747	0.1378235	0.1378235	0	0%				N
Lead, TCLP equivalent (calc)	C	mg/L	-0.0000022	0		0	0	0	0.0520335	0.0520335	0	0%				
Manganese as MnO	C	mg/kg	-5.08E-06	0		0	0	0	1.4181693	1.4181693	100000	0%				
Selenium, TCLP equivalent (calc)	C	mg/L	-0.0000035	0		0	0	0	0.0441539	0.05	0	0%				
Silver, TCLP equivalent (calc)	C	mg/L	-2.45E-06	0		0	0	0	0.0125002	0.05	0	0%				
Strontium as SrO	C	mg/kg	0.00002006	0		0	0	0	0.1406797	1.18	100000	0%				
Thorium 232, Activity	C	pCi/g	-6.54E-07	0		0	0	0.0205318	0.0860912	0.109	100000	0%				
Titanium as TiO2	C	mg/kg	0.0000668	0		0	0	0.5754131	1.5222363	1.67	100000	0%				
Uranium, Activity	C	pCi/g	-7.921E-05	0		0	0	0	0.0202175	0.677	3	0%				

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685212	B18012206-001	6010.20-S	PDS1		2/6/2018 4:58:00	5.1	118183	2/5/2018 7:5	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.05466	25.9949295		23.77875	0	0	3.2643468	5	5	109%	75	125	0%	
Antimony	A	mg/kg	0.05159	24.5349143		23.77875	0	0	0.0530932	1	5	103%	75	125	0%	
Arsenic	A	mg/kg	0.0505	24.0165375		23.77875	0	0	0.1589372	1	5	101%	75	125	0%	
Barium	A	mg/kg	0.05293	25.1721848		23.77875	0	0	0.0629566	1	5	106%	75	125	0%	
Beryllium	A	mg/kg	0.05288	25.148406		23.77875	0	0	0.0163408	1	5	106%	75	125	0%	
Boron	A	mg/kg	0.0534	25.395705		23.77875	0	0	0.4032876	1	5	107%	75	125	0%	
Cadmium	A	mg/kg	0.05059	24.0593393		23.77875	0	0	0.0327671	1	5	101%	75	125	0%	
Chromium	A	mg/kg	0.05696	27.088752		23.77875	2.4314938	0	0.5623199	1	5	104%	75	125	0%	
Cobalt	A	mg/kg	0.05255	24.9914663		23.77875	0	0	0.018186	1	5	105%	75	125	0%	
Copper	A	mg/kg	0.05278	25.1008485		23.77875	0.5660275	0	0.3177792	1	5	103%	75	125	0%	
Lead	A	mg/kg	0.05171	24.5919833		23.77875	0	0	0.2122967	1	5	103%	75	125	0%	
Manganese	A	mg/kg	0.05274	25.0818255		23.77875	0	0	0.2278004	1	5	105%	75	125	0%	
Molybdenum	A	mg/kg	0.05359	25.4860643		23.77875	0	0	0.0445709	1	5	107%	75	125	0%	
Nickel	A	mg/kg	0.05596	26.613177		23.77875	2.0687513	0	0.0824837	1	5	103%	75	125	0%	
Selenium	A	mg/kg	0.0504	23.96898		23.77875	0	0	0.1801478	1	5	101%	75	125	0%	
Silver	A	mg/kg	0.02126	10.1107245		9.5115	0	0	0.0510007	1	1	106%	75	125	0%	
Strontium	A	mg/kg	0.05069	24.1068968		23.77875	0	0	0.0243209	1	5	101%	75	125	0%	
Thallium	A	mg/kg	0.04976	23.664612		23.77875	0	0	0.0226279	1	5	100%	75	125	0%	
Thorium	A	mg/kg	0.05269	25.0580468		23.77875	0.188365	0	0.1611248	1	5	105%	75	125	0%	
Thorium 232	A	mg/kg	0.05269	25.0580468		23.77875	0.188365	0	0.1611248	1	5	105%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685212	B18012206-001	6010.20-S	PDS1		2/6/2018 4:58:00	5.1	118183	2/5/2018 7:5	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/kg	0.05842	27.7830915		23.77875	1.99182	0	0.4074727	1	5	108%	75	125	0%	
Titanium	A	mg/kg	0.05802	27.5928615		23.77875	0.3445588	0	0.1859498	1	5	115%	75	125	0%	
Uranium	A	mg/kg	0.0531	25.2530325		23.77875	0	0	0.0060921	1	5	106%	75	125	0%	
Vanadium	A	mg/kg	0.05443	25.8855473		23.77875	0	0	0.7961126	1	5	109%	75	125	0%	
Zinc	A	mg/kg	0.05019	23.8691093		23.77875	0	0	1.1623053	1.1623053	5	100%	75	125	0%	
Aluminum as Al2O3	C	mg/kg	0.1033074	49.1304168		0	0	0	6.1696155	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.002525	1.20082688		0	0	0	0.0079469	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	0.0592816	28.1928469		0	0	0	0.0705114	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		1.25852869		0	0	0	0.0031476	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.0025295	1.20296696		0	0	0	0.0016384	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.002848	1.3544376		0	0.1215747	0	0.028116	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.0025855	1.22959916		0	0	0	0.0106148	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	0.0669798	31.8539184		0	0	0	0.2893065	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.00252	1.198449		0	0	0	0.0090074	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.001063	0.50553623		0	0	0	0.0025500	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	0.0598142	28.4461382		0	0	0	0.0286987	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	0.00574321	2.7313271		0	0.0205318	0	0.0175626	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.0968934	46.0800787		0	0.5754131	0	0.3105362	1.67	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g	0.0359487	17.0963030		0	0	0	0.0041244	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685213	SRM2-118183	6010.20-S	SRM2		2/6/2018 5:00:00	5	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.2413	115.474115		100	0	0	3.2847672	5	5	115%	70	130	0%	
Antimony	A	mg/kg	0.000721	0.34503455		0	0	0	0.0534253	1	5	0%	70	130	0%	
Arsenic	A	mg/kg	0.2026	96.95423		0	0	0	0.1599314	1	5	0%	0	0	0%	
Barium	A	mg/kg	0.2205	105.520275		100	0	0	0.0633504	1	5	106%	70	130	0%	
Beryllium	A	mg/kg	-0.00004	0		0	0	0	0.016443	1	5	0%	70	130	0%	
Boron	A	mg/kg	0.1845	88.292475		0	0	0	0.4058104	1	5	0%	0	0	0%	
Cadmium	A	mg/kg	0.2172	103.94106		100	0	0	0.0329721	1	5	104%	70	130	0%	
Chromium	A	mg/kg	0.2279	109.061545		100	0	0	0.5658375	1	5	109%	70	130	0%	
Cobalt	A	mg/kg	0.000177	0.08470335		0	0	0	0.0182998	1	5	0%	70	130	0%	
Copper	A	mg/kg	0.2268	108.53514		100	0	0	0.3197671	1	5	109%	70	130	0%	
Lead	A	mg/kg	0.224	107.1952		100	0	0	0.2136247	1	5	107%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685213	SRM2-118183	6010.20-S	SRM2		2/6/2018 5:00:00	5	118183	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	mg/kg	0.232	111.0236		100	0	0	0.2292255	1	5	111%	70	130	0%	
Molybdenum	A	mg/kg	0.207	99.05985		100	0	0	0.0448497	1	5	99%	70	130	0%	
Nickel	A	mg/kg	0.2278	109.01369		100	0	0	0.0829997	1	5	109%	70	130	0%	
Selenium	A	mg/kg	0.203	97.14565		0	0	0	0.1812747	1	5	0%	0	0	0%	
Silver	A	mg/kg	0.2333	111.645715		100	0	0	0.0513197	1	1	112%	70	130	0%	
Strontium	A	mg/kg	0.001063	0.50869865		0	0	0	0.0244730	1	5	0%	70	130	0%	
Thallium	A	mg/kg	-0.000011	0		0	0	0	0.0227694	1	5	0%	70	130	0%	
Thorium	A	mg/kg	0.002228	1.0662094		0	0	0	0.1621327	1	5	0%	70	0	0%	
Thorium 232	A	mg/kg	0.002228	1.0662094		0	0	0	0.1621327	1	5	0%	0	0	0%	
Tin	A	mg/kg	0.1964	93.98722		100	0	0	0.4100216	1	5	94%	70	130	0%	
Titanium	A	mg/kg	0.2104	100.68692		100	0	0	0.1871131	1	5	101%	70	130	0%	
Uranium	A	mg/kg	-0.000023	0		0	0	0	0.0061302	1	5	0%	70	130	0%	
Vanadium	A	mg/kg	0.2228	106.62094		100	0	0	0.8010927	1	5	107%	70	130	0%	
Zinc	A	mg/kg	0.2148	102.79254		100	0	0	1.1695762	1.1695762	5	103%	70	130	0%	
Aluminum as Al2O3	C	mg/kg	0.456057	218.246077		0	0	0	6.2082100	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.01013	4.8477115		0	0	0	0.0079966	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	0.24696	118.182708		0	0	0	0.0709525	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		5.27567609		0	0	0	0.0031673	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.01086	5.197053		0	0	0	0.0016486	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.011395	5.45307725		0	0	0	0.0282919	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.0112	5.35976		0	0	0	0.0106812	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	0.29464	140.999972		0	0	0	0.2911163	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.01015	4.8572825		0	0	0	0.0090637	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.011665	5.58228575		0	0	0	0.002566	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	0.00125434	0.60026441		0	0	0	0.0288782	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	0.00024285	0.11621682		0	0	0	0.0176725	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.351368	168.147156		0	0	0	0.3124788	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	-1.557E-05	0		0	0	0	0.0041502	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685214	B18012206-001	6010.20-S	MS3		2/6/2018 5:03:00	5	118183	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685214	B18012206-001	6010.20-S	MS3		2/6/2018 5:03:00	5	118183	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	1.001	492.9925		492.5	0	0	3.38052	5	5	100%	75	125	0%	
Antimony	A	mg/kg	0.192	94.56		98.5	0	0	0.0549827	1	5	96%	75	125	0%	
Arsenic	A	mg/kg	0.1929	95.00325		98.5	0	0	0.1645935	1	5	96%	75	125	0%	
Barium	A	mg/kg	0.2057	101.30725		98.5	0	0	0.0651972	1	5	103%	75	125	0%	
Beryllium	A	mg/kg	0.1045	51.46625		49.25	0	0	0.0169223	1	5	104%	75	125	0%	
Boron	A	mg/kg	0.218	107.365		98.5	0	0	0.41764	1	5	109%	75	125	0%	
Cadmium	A	mg/kg	0.0996	49.053		49.25	0	0	0.0339333	1	5	100%	75	125	0%	
Chromium	A	mg/kg	0.203	99.9775		98.5	2.4314938	0	0.582332	1	5	99%	75	125	0%	
Cobalt	A	mg/kg	0.2025	99.73125		98.5	0	0	0.0188332	1	5	101%	75	125	0%	
Copper	A	mg/kg	0.2035	100.22375		98.5	0.5660275	0	0.3290885	1	5	101%	75	125	0%	
Lead	A	mg/kg	0.2006	98.7955		98.5	0	0	0.219852	1	5	100%	75	125	0%	
Manganese	A	mg/kg	0.9933	489.20025		492.5	0	0	0.2359075	1	5	99%	75	125	0%	
Molybdenum	A	mg/kg	0.1994	98.2045		98.5	0	0	0.0461571	1	5	100%	75	125	0%	
Nickel	A	mg/kg	0.2065	101.70125		98.5	2.0687513	0	0.0854192	1	5	101%	75	125	0%	
Selenium	A	mg/kg	0.1953	96.18525		98.5	0	0	0.186559	1	5	98%	75	125	0%	
Silver	A	mg/kg	0.09149	45.058825		49.25	0	0	0.0528157	1	1	91%	75	125	0%	
Strontium	A	mg/kg	0.1923	94.70775		98.5	0	0	0.0251865	1	5	96%	75	125	0%	
Thallium	A	mg/kg	0.1878	92.4915		98.5	0	0	0.0234332	1	5	94%	75	125	0%	
Thorium	A	mg/kg	0.2039	100.42075		98.5	0.188365	0	0.166859	1	5	102%	75	125	0%	
Thorium 232	A	mg/kg	0.2039	100.42075		98.5	0.188365	0	0.166859	1	5	102%	75	125	0%	
Tin	A	mg/kg	0.2123	104.55775		98.5	1.99182	0	0.421974	1	5	104%	75	125	0%	
Titanium	A	mg/kg	0.1927	94.90475		98.5	0.3445588	0	0.1925675	1	5	96%	75	125	0%	
Uranium	A	mg/kg	0.2026	99.7805		98.5	0	0	0.0063089	1	5	101%	75	125	0%	
Vanadium	A	mg/kg	0.2048	100.864		98.5	0	0	0.824445	1	5	102%	75	125	0%	
Zinc	A	mg/kg	0.1903	93.72275		98.5	0	0	1.20367	1.20367	5	95%	75	125	0%	
Aluminum as Al2O3	C	mg/kg	1.89189	931.755825		0	0	0	6.3891828	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.009645	4.7501625		0	0	0	0.0082297	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	0.230384	113.46412		0	0	0	0.0730208	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		5.06503832		0	0	0	0.0032596	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.00498	2.45265		0	0	0	0.0016967	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.01015	4.998875		0	0.1215747	0	0.0291166	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.01003	4.939775		0	0	0	0.0109926	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	1.261491	621.284318		0	0	0	0.2996025	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.009765	4.8092625		0	0	0	0.009328	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.0045745	2.25294125		0	0	0	0.0026408	0.05	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685214	B18012206-001	6010.20-S	MS3		2/6/2018 5:03:00	5	118183	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium as SrO	C	mg/kg	0.226914	111.755145		0	0	0	0.0297200	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	0.0222251	10.9458618		0	0.0205318	0	0.0181876	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.321809	158.490933		0	0.5754131	0	0.3215877	1.67	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g	0.1371602	67.5513985		0	0	0	0.0042711	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685215	B18012206-001	6010.20-S	MSD3		2/6/2018 5:05:00	5	118183	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	1.004	496.729		494.75	0	492.9925	3.395964	5	5	100%	75	125	1%	
Antimony	A	mg/kg	0.1892	93.6067		98.95	0	94.56	0.0552339	1	5	95%	75	125	1%	
Arsenic	A	mg/kg	0.1948	96.3773		98.95	0	95.00325	0.1653455	1	5	97%	75	125	1%	
Barium	A	mg/kg	0.2077	102.759575		98.95	0	101.30725	0.0654950	1	5	104%	75	125	1%	
Beryllium	A	mg/kg	0.1057	52.295075		49.475	0	51.46625	0.0169996	1	5	106%	75	125	2%	
Boron	A	mg/kg	0.2164	107.0639		98.95	0	107.365	0.419548	1	5	108%	75	125	0%	
Cadmium	A	mg/kg	0.09927	49.1138325		49.475	0	49.053	0.0340883	1	5	99%	75	125	0%	
Chromium	A	mg/kg	0.2083	103.056425		98.95	2.4314938	99.9775	0.5849924	1	5	102%	75	125	3%	
Cobalt	A	mg/kg	0.2067	102.264825		98.95	0	99.73125	0.0189192	1	5	103%	75	125	3%	
Copper	A	mg/kg	0.2049	101.374275		98.95	0.5660275	100.22375	0.330592	1	5	102%	75	125	1%	
Lead	A	mg/kg	0.2029	100.384775		98.95	0	98.7955	0.2208564	1	5	101%	75	125	2%	
Manganese	A	mg/kg	1.006	497.7185		494.75	0	489.20025	0.2369853	1	5	101%	75	125	2%	
Molybdenum	A	mg/kg	0.1978	97.86155		98.95	0	98.2045	0.046368	1	5	99%	75	125	0%	
Nickel	A	mg/kg	0.2092	103.5017		98.95	2.0687513	101.70125	0.0858094	1	5	103%	75	125	2%	
Selenium	A	mg/kg	0.197	97.46575		98.95	0	96.18525	0.1874113	1	5	99%	75	125	1%	
Silver	A	mg/kg	0.08643	42.7612425		49.475	0	45.058825	0.053057	1	1	86%	75	125	5%	
Strontium	A	mg/kg	0.1957	96.822575		98.95	0	94.70775	0.0253015	1	5	98%	75	125	2%	
Thallium	A	mg/kg	0.1904	94.2004		98.95	0	92.4915	0.0235402	1	5	95%	75	125	2%	
Thorium	A	mg/kg	0.2096	103.6996		98.95	0.188365	100.42075	0.1676213	1	5	105%	75	125	3%	
Thorium 232	A	mg/kg	0.2096	103.6996		98.95	0.188365	100.42075	0.1676213	1	5	105%	75	125	3%	
Tin	A	mg/kg	0.2131	105.431225		98.95	1.99182	104.55775	0.4239018	1	5	105%	75	125	1%	
Titanium	A	mg/kg	0.1958	96.87205		98.95	0.3445588	94.90475	0.1934473	1	5	98%	75	125	2%	
Uranium	A	mg/kg	0.2039	100.879525		98.95	0	99.7805	0.0063377	1	5	102%	75	125	1%	
Vanadium	A	mg/kg	0.2068	102.3143		98.95	0	100.864	0.8282115	1	5	103%	75	125	1%	
Zinc	A	mg/kg	0.1975	97.713125		98.95	0	93.72275	1.209169	1.209169	5	99%	75	125	4%	
Aluminum as Al2O3	C	mg/kg	1.89756	938.81781		0	0	931.75583	6.418372	9.45	100000	0%	0	0	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685215	B18012206-001	6010.20-S	MSD3		2/6/2018 5:05:00	5	118183	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic, TCLP equivalent (calc)	C	mg/L	0.00974	4.818865		0	0	4.7501625	0.0082673	0.05	0	0%	0	0	1%	
Barium as BaO	C	mg/kg	0.232624	115.090724		0	0	113.46412	0.0733544	1.12	100000	0%	0	0	1%	
Barium, TCLP equivalent (calc)	C	mg/L		5.13764992		0	0	5.0650383	0.0032745	0.0499968	0	0%	0	0	1%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.0049635	2.45569163		0	0	2.45265	0.0017044	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.010415	5.15282125		0	0.1215747	4.998875	0.0292496	0.05	0	0%	0	0	3%	
Lead, TCLP equivalent (calc)	C	mg/L	0.010145	5.01923875		0	0	4.939775	0.0110428	0.05	0	0%	0	0	2%	
Manganese as MnO	C	mg/kg	1.27762	632.102495		0	0	621.28432	0.3009713	1.27	100000	0%	0	0	2%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.00985	4.8732875		0	0	4.8092625	0.0093706	0.05	0	0%	0	0	1%	
Silver, TCLP equivalent (calc)	C	mg/L	0.0043215	2.13806213		0	0	2.2529413	0.0026528	0.05	0	0%	0	0	5%	
Strontium as SrO	C	mg/kg	0.230926	114.250639		0	0	111.75515	0.0298558	1.18	100000	0%	0	0	2%	
Thorium 232, Activity	C	pCi/g	0.0228464	11.3032564		0	0.0205318	10.945862	0.0182707	0.109	100000	0%	0	0	3%	
Titanium as TiO2	C	mg/kg	0.326986	161.776324		0	0.5754131	158.49093	0.3230569	1.67	100000	0%	75	0	2%	
Uranium, Activity	C	pCi/g	0.1380403	68.2954384		0	0	67.551399	0.0042907	0.677	3	0%	0	0	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685216	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 5:08:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.002449	0.002449		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	J
Antimony	A	mg/L	0.000471	0.000471		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000519	0.000519		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.00052	0.00052		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000093	0.000093		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	0.001856	0.001856		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000242	0.000242		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000418	0.000418		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000449	0.000449		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.00034	0.00034		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000459	0.000459		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.01799	0.01799		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000417	0.000417		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000693	0.000693		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.00235	0.00235		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000014	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000628	0.000628		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685216	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 5:08:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/L	0.000542	0.000542		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000619	0.000619		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000305	0.000305		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000406	0.000406		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000457	0.000457		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000527	0.000527		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000527	0.000527		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000382	0.000382		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000634	0.000634		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000358	0.000358		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000469	0.000469		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000512	0.000512		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685217	CCV	ICPMS-200.8-W	CCV		2/6/2018 5:11:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.05399	0.05399		0.05	0	0	0.0002849	0.1	4.5	108%	90	110	0%	
Antimony	A	mg/L	0.05058	0.05058		0.05	0	0	3.047E-05	0.05	18	101%	90	110	0%	
Arsenic	A	mg/L	0.05065	0.05065		0.05	0	0	6.629E-05	0.005	18	101%	90	110	0%	
Barium	A	mg/L	0.05123	0.05123		0.05	0	0	6.437E-05	0.1	18	102%	90	110	0%	
Beryllium	A	mg/L	0.05223	0.05223		0.05	0	0	8.97E-06	0.001	4.5	104%	90	110	0%	
Boron	A	mg/L	0.05205	0.05205		0.05	0	0	0.00141	0.1	4.5	104%	90	110	0%	
Cadmium	A	mg/L	0.04979	0.04979		0.05	0	0	1.468E-05	0.001	18	100%	90	110	0%	
Cerium	A	mg/L	0.05006	0.05006		0.05	0	0	2.257E-05	0.001	4.5	100%	90	110	0%	
Chromium	A	mg/L	0.05191	0.05191		0.05	0	0	5.576E-05	0.01	18	104%	90	110	0%	
Cobalt	A	mg/L	0.05205	0.05205		0.05	0	0	3.904E-05	0.01	18	104%	90	110	0%	
Copper	A	mg/L	0.05084	0.05084		0.05	0	0	7.681E-05	0.01	4.5	102%	90	110	0%	
Iron	A	mg/L	1.387	1.387		1.3	0	0	0.000175	0.02	4.5	107%	90	110	0%	
Lanthanum	A	mg/L	0.05103	0.05103		0.05	0	0	0.0000111	0.001	4.5	102%	90	110	0%	
Lead	A	mg/L	0.05028	0.05028		0.05	0	0	2.956E-05	0.01	18	101%	90	110	0%	
Manganese	A	mg/L	0.05364	0.05364		0.05	0	0	3.649E-05	0.01	18	107%	90	110	0%	
Mercury	A	mg/L	0.001039	0.001039		0.001	0	0	1.289E-05	0.001	0.36	104%	90	110	0%	
Molybdenum	A	mg/L	0.04977	0.04977		0.05	0	0	2.302E-05	0.005	9	100%	90	110	0%	
Nickel	A	mg/L	0.05184	0.05184		0.05	0	0	7.128E-05	0.01	4.5	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685217	CCV	ICPMS-200.8-W CCV			2/6/2018 5:11:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	0.05203	0.05203		0.05	0	0	0.0001532	0.005	18	104%	90	110	0%	
Silver	A	mg/L	0.02002	0.02002		0.02	0	0	2.959E-05	0.005	1.8	100%	90	110	0%	
Strontium	A	mg/L	0.05071	0.05071		0.05	0	0	1.229E-05	0.1	18	101%	90	110	0%	
Thallium	A	mg/L	0.04931	0.04931		0.05	0	0	1.434E-05	0.1	18	99%	90	110	0%	
Thorium	A	mg/L	0.04716	0.04716		0.05	0	0	5.767E-05	0.001	4.5	94%	90	110	0%	
Thorium 232	A	mg/L	0.04716	0.04716		0.05	0	0	5.767E-05	0.01	4.5	94%	90	110	0%	
Tin	A	mg/L	0.05088	0.05088		0.05	0	0	5.199E-05	0.1	9	102%	90	110	0%	
Titanium	A	mg/L	0.05008	0.05008		0.05	0	0	0.0001736	0.01	18	100%	90	110	0%	
Uranium	A	mg/L	0.05081	0.05081		0.05	0	0	1.332E-05	0.001	4.5	102%	90	110	0%	
Vanadium	A	mg/L	0.052	0.052		0.05	0	0	7.351E-05	0.1	18	104%	90	110	0%	
Zinc	A	mg/L	0.05074	0.05074		0.05	0	0	0.0002495	0.01	4.5	101%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685218	Rinse	ICPMS-200.8-W SAMP			2/6/2018 5:13:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00083	0.00083		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	J
Antimony	A	mg/L	0.000106	0.000106		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000199	0.000199		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000108	0.000108		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000015	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000168	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000085	0.000085		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000143	0.000143		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000191	0.000191		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000051	0.000051		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000105	0.000105		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000156	0.000156		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000402	0.000402		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.00072	0.00072		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000002	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000363	0.000363		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000131	0.000131		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000339	0.000339		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000311	0.000311		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685218	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 5:13:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium	A	mg/L	0.000104	0.000104		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000165	0.000165		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000437	0.000437		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000437	0.000437		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000551	0.000551		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000152	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000092	0.000092		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000182	0.000182		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000178	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685219	CCB	ICPMS-200.8-W	CCB		2/6/2018 5:16:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.000356	0.000356		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000006	0.000006		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000041	0.000041		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.00006	0.00006		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000083	-0.000083		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000872	-0.000872		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000011	-0.000011		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000097	0.000097		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.00007	0.00007		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000047	-0.000047		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000002	0.000002		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01924	0.01924		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000096	0.000096		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000212	0.000212		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000488	0.000488		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.00001	-0.00001		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000043	0.000043		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000129	0.000129		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000221	0.000221		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000089	0.000089		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000014	0.000014		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685219	CCB	ICPMS-200.8-W	CCB		2/6/2018 5:16:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.000088	0.000088		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000102	0.000102		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000102	0.000102		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000044	0.000044		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000028	0.000028		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000012	-0.000012		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000084	0.000084		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000023	-0.000023		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685669	CCV	ICPMS-200.8-W	CCV		2/6/2018 5:19:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.05302	0.05302		0.05	0	0	0.0002849	0.1	4.5	106%	90	110	0%	
Antimony	A	mg/L	0.05159	0.05159		0.05	0	0	3.047E-05	0.05	18	103%	90	110	0%	
Arsenic	A	mg/L	0.05062	0.05062		0.05	0	0	6.629E-05	0.005	18	101%	90	110	0%	
Barium	A	mg/L	0.05211	0.05211		0.05	0	0	6.437E-05	0.1	18	104%	90	110	0%	
Beryllium	A	mg/L	0.05287	0.05287		0.05	0	0	8.97E-06	0.001	4.5	106%	90	110	0%	
Boron	A	mg/L	0.0514	0.0514		0.05	0	0	0.00141	0.1	4.5	103%	90	110	0%	
Cadmium	A	mg/L	0.05093	0.05093		0.05	0	0	1.468E-05	0.001	18	102%	90	110	0%	
Cerium	A	mg/L	0.05102	0.05102		0.05	0	0	2.257E-05	0.001	4.5	102%	90	110	0%	
Chromium	A	mg/L	0.05194	0.05194		0.05	0	0	5.576E-05	0.01	18	104%	90	110	0%	
Cobalt	A	mg/L	0.05231	0.05231		0.05	0	0	3.904E-05	0.01	18	105%	90	110	0%	
Copper	A	mg/L	0.05104	0.05104		0.05	0	0	7.681E-05	0.01	4.5	102%	90	110	0%	
Iron	A	mg/L	1.392	1.392		1.3	0	0	0.000175	0.02	4.5	107%	90	110	0%	
Lanthanum	A	mg/L	0.05188	0.05188		0.05	0	0	0.0000111	0.001	4.5	104%	90	110	0%	
Lead	A	mg/L	0.05142	0.05142		0.05	0	0	2.956E-05	0.01	18	103%	90	110	0%	
Manganese	A	mg/L	0.05282	0.05282		0.05	0	0	3.649E-05	0.01	18	106%	90	110	0%	
Mercury	A	mg/L	0.001016	0.001016		0.001	0	0	1.289E-05	0.001	0.36	102%	90	110	0%	
Molybdenum	A	mg/L	0.05108	0.05108		0.05	0	0	2.302E-05	0.005	9	102%	90	110	0%	
Nickel	A	mg/L	0.05206	0.05206		0.05	0	0	7.128E-05	0.01	4.5	104%	90	110	0%	
Selenium	A	mg/L	0.05253	0.05253		0.05	0	0	0.0001532	0.005	18	105%	90	110	0%	
Silver	A	mg/L	0.02061	0.02061		0.02	0	0	2.959E-05	0.005	1.8	103%	90	110	0%	
Strontium	A	mg/L	0.05071	0.05071		0.05	0	0	1.229E-05	0.1	18	101%	90	110	0%	
Thallium	A	mg/L	0.05008	0.05008		0.05	0	0	1.434E-05	0.1	18	100%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685669	CCV	ICPMS-200.8-W CCV			2/6/2018 5:19:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thorium	A	mg/L	0.04917	0.04917		0.05	0	0	5.767E-05	0.001	4.5	98%	90	110	0%	
Thorium 232	A	mg/L	0.04917	0.04917		0.05	0	0	5.767E-05	0.01	4.5	98%	90	110	0%	
Tin	A	mg/L	0.05237	0.05237		0.05	0	0	5.199E-05	0.1	9	105%	90	110	0%	
Titanium	A	mg/L	0.05044	0.05044		0.05	0	0	0.0001736	0.01	18	101%	90	110	0%	
Uranium	A	mg/L	0.05196	0.05196		0.05	0	0	1.332E-05	0.001	4.5	104%	90	110	0%	
Vanadium	A	mg/L	0.0518	0.0518		0.05	0	0	7.351E-05	0.1	18	104%	90	110	0%	
Zinc	A	mg/L	0.05043	0.05043		0.05	0	0	0.0002495	0.01	4.5	101%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685670	Rinse	ICPMS-200.8-W SAMP			2/6/2018 5:21:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000023	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000077	0.000077		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000066	0.000066		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000051	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000055	0.000055		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000089	0.000089		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000091	0.000091		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000005	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.00003	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.0001	0.0001		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000158	0.000158		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000245	0.000245		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000471	0.000471		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.00026	0.00026		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000251	0.000251		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000045	0.000045		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000146	0.000146		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000378	0.000378		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000378	0.000378		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.00042	0.00042		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000098	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000029	0.000029		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000105	0.000105		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685670	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 5:21:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/L	0.000003	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685671	CCB	ICPMS-200.8-W	CCB		2/6/2018 5:24:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.000143	0.000143		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000046	-0.000046		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000033	-0.000033		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000006	-0.000006		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00013	-0.00013		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001057	-0.001057		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000024	-0.000024		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000041	0.000041		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000055	-0.000055		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000113	-0.000113		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.00007	-0.00007		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.0159	0.0159		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000048	0.000048		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000039	0.000039		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000175	0.000175		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000008	-0.000008		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000054	-0.000054		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000007	0.000007		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000087	-0.000087		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.00004	0.00004		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000039	-0.000039		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.00006	0.00006		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.00005	0.00005		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.00005	0.00005		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.00001	0.00001		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000041	0.000041		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000062	-0.000062		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000044	0.000044		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000115	-0.000115		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685671	CCB	ICPMS-200.8-W	CCB		2/6/2018 5:24:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685672	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 5:27:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000074	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000008	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000008	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000081	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000006	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000031	0.000031		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	-0.000003	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000045	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000066	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000027	0.000027		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000036	0.000036		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Molybdenum	A	mg/L	-0.00008	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000045	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000066	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000012	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.0001	0.0001		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	-0.000019	0		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000019	0		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000107	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000033	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000037	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000058	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000002	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685673	MB-118184	6010.20-S	MBLK		2/6/2018 5:29:00	2	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685673	MB-118184	6010.20-S	MBLK		2/6/2018 5:29:00	2	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.004055	0		0	0	0	0.6864	5	5	0%	0	0	0%	
Antimony	A	mg/kg	0.000089	0		0	0	0	0.011164	1	5	0%	0	0	0%	
Arsenic	A	mg/kg	-0.001173	0		0	0	0	0.03342	1	5	0%	0	0	0%	
Barium	A	mg/kg	0.000022	0		0	0	0	0.013238	1	5	0%	0	0	0%	
Beryllium	A	mg/kg	-0.000116	0		0	0	0	0.003436	1	5	0%	0	0	0%	
Boron	A	mg/kg	-0.000288	0		0	0	0	0.0848	1	5	0%	0	0	0%	
Cadmium	A	mg/kg	0.000013	0		0	0	0	0.00689	1	5	0%	0	0	0%	
Chromium	A	mg/kg	0.006884	0.6884		0	0	0	0.11824	1	5	0%	0	0	0%	
Cobalt	A	mg/kg	-0.000169	0		0	0	0	0.003824	1	5	0%	0	0	0%	
Copper	A	mg/kg	0.000529	0		0	0	0	0.06682	1	5	0%	0	0	0%	
Lead	A	mg/kg	0.00021	0		0	0	0	0.04464	1	5	0%	0	0	0%	
Manganese	A	mg/kg	0.000436	0		0	0	0	0.0479	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg	0.000063	0		0	0	0	0.009372	1	5	0%	0	0	0%	
Nickel	A	mg/kg	0.000197	0.0197		0	0	0	0.017344	1	5	0%	0	0	0%	
Selenium	A	mg/kg	0.000239	0		0	0	0	0.03788	1	5	0%	0	0	0%	
Silver	A	mg/kg	0.000376	0.0376		0	0	0	0.010724	1	1	0%	0	0	0%	
Strontium	A	mg/kg	0.000003	0		0	0	0	0.005114	1	5	0%	0	0	0%	
Thallium	A	mg/kg	-0.000012	0		0	0	0	0.004758	1	5	0%	0	0	0%	
Thorium	A	mg/kg	0.006398	0.6398		0	0	0	0.03388	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg	0.006398	0.6398		0	0	0	0.03388	1	5	0%	0	0	0%	
Tin	A	mg/kg	0.01169	1.169		0	0	0	0.08568	1	5	0%	0	0	0%	
Titanium	A	mg/kg	0.000645	0.0645		0	0	0	0.0391	1	5	0%	0	0	0%	
Uranium	A	mg/kg	-0.000075	0		0	0	0	0.001281	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	0.000435	0		0	0	0	0.1674	1	5	0%	0	0	0%	
Zinc	A	mg/kg	0.00177	0		0	0	0	0.2444	1	5	0%	0	0	0%	
Aluminum as Al2O3	C	mg/kg	0.00766395	0		0	0	0	1.297296	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	-5.865E-05	0		0	0	0	0.001671	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	0.00002464	0		0	0	0	0.0148266	1.12	100000	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.00000065	0		0	0	0	0.0003445	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.0003442	0.03442		0	0	0	0.005912	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.0000105	0		0	0	0	0.002232	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	0.00055372	0		0	0	0	0.060833	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.00001195	0		0	0	0	0.001894	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.0000188	0.00188		0	0	0	0.0005362	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	0.00000354	0		0	0	0	0.0060345	1.18	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685673	MB-118184	6010.20-S	MBLK		2/6/2018 5:29:00	2	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thorium 232, Activity	C	pCi/g	0.00069738	0.0697382		0	0	0	0.0036929	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.00107715	0.107715		0	0	0	0.065297	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	-5.078E-05	0		0	0	0	0.0008672	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685674	B18012116-001	6010.20-S	SAMP		2/6/2018 5:32:00	20	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg	0.1701	103.62492		0	0	0	0.0680111	5	5	0%	0	0	0%	
Arsenic	A	mg/kg	0.002631	1.6028052		0	0	0	0.2035946	5	5	0%	0	0	0%	J
Cadmium	A	mg/kg	0.000871	0.5306132		0	0	0	0.0419739	1	5	0%	0	0	0%	J
Cobalt	A	mg/kg	0.000405	0.246726		0	0	0	0.0232958	5	5	0%	0	0	0%	J
Copper	A	mg/kg	1.106	673.7752		0	0	0	0.4070674	5	5	0%	0	0	0%	
Lead	A	mg/kg	0.6068	369.66256		0	0	0	0.2719469	5	5	0%	0	0	0%	
Molybdenum	A	mg/kg	0.002694	1.6411848		0	0	0	0.0570942	5	5	0%	0	0	0%	J
Nickel	A	mg/kg	0.03346	20.383832		0	0	0	0.1056596	5	5	0%	0	0	0%	
Selenium	A	mg/kg	0.000651	0.3965892		0	0	0	0.230765	5	5	0%	0	0	0%	J
Silver	A	mg/kg	-0.000016	0		0	0	0	0.0653306	5	1	0%	0	0	0%	
Thallium	A	mg/kg	-0.00011	0		0	0	0	0.0289857	5	5	0%	0	0	0%	
Thorium	A	mg/kg	-0.000001	0		0	0	0	0.206397	5	5	0%	0	0	0%	
Thorium 232	A	mg/kg	-0.000001	0		0	0	0	0.206397	0.206397	5	0%	0	0	0%	
Titanium	A	mg/kg	0.007795	4.748714		0	0	0	0.2381972	5	5	0%	0	0	0%	J
Uranium	A	mg/kg	-0.000021	0		0	0	0	0.0078039	5	5	0%	0	0	0%	
Barium	B	mg/kg	0.03323	20.243716		0	0	0	0.0806459	5	5	0%	0	0	0%	
Barium as BaO	B	mg/kg	0.0372176	22.6729619		0	0	0	0.0903234	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L		1.01212102		0	0	0	0.0040320	0.249984	0	0%	0	0	0%	D
Beryllium	B	mg/kg	-0.000125	0		0	0	0	0.0209321	5	5	0%	0	0	0%	
Lead, TCLP equivalent (calc)	B	mg/L	0.03034	18.483128		0	0	0	0.0135973	0.25	0	0%	0	0	0%	*
Strontium	B	mg/kg	0.06791	41.370772		0	0	0	0.0311545	5	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg	0.0801338	48.817511		0	0	0	0.0367623	5.9	100000	0%	0	0	0%	
Zinc	B	mg/kg	0.08172	49.783824		0	0	0	1.4888848	5	5	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.00013155	0.08014026		0	0	0	0.0101797	0.25	0	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	C	mg/L	0.00004355	0.02653066		0	0	0	0.0020987	0.05	0	0%	0	0	0%	J
Selenium, TCLP equivalent (calc)	C	mg/L	0.00003255	0.01982946		0	0	0	0.0115382	0.25	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L	-0.0000008	0		0	0	0	0.0032665	0.25	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685674	B18012116-001	6010.20-S	SAMP		2/6/2018 5:32:00	20	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thorium 232, Activity	C	pCi/g	-1.09E-07	0		0	0	0	0.0224973	0.0224973	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.01301765	7.93035238		0	0	0	0.3977893	8.35	100000	0%	0	0	0%	J
Uranium, Activity	C	pCi/g	-1.422E-05	0		0	0	0	0.0052832	3.385	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685675	B18020111-001	6010.20-S	SAMP		2/6/2018 5:34:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg	0.000593	0.29006595		0	0	0	0.0546087	5	5	0%	0	0	0%	J
Arsenic	A	mg/kg	0.003251	1.59022665		0	0	0	0.1634739	5	5	0%	0	0	0%	J
Cadmium	A	mg/kg	0.000561	0.27441315		0	0	0	0.0337024	1	5	0%	0	0	0%	J
Cobalt	A	mg/kg	0.01206	5.899149		0	0	0	0.0187051	5	5	0%	0	0	0%	
Copper	A	mg/kg	0.06898	33.741567		0	0	0	0.3268500	5	5	0%	0	0	0%	
Lead	A	mg/kg	0.01001	4.8963915		0	0	0	0.2183566	5	5	0%	0	0	0%	J
Molybdenum	A	mg/kg	0.001374	0.6720921		0	0	0	0.0458431	5	5	0%	0	0	0%	J
Nickel	A	mg/kg	0.01961	9.5922315		0	0	0	0.0848382	5	5	0%	0	0	0%	
Selenium	A	mg/kg	0.01445	7.0682175		0	0	0	0.1852900	5	5	0%	0	0	0%	
Silver	A	mg/kg	0.000186	0.0909819		0	0	0	0.0524564	5	1	0%	0	0	0%	J
Thallium	A	mg/kg	-0.000039	0		0	0	0	0.0232738	5	5	0%	0	0	0%	
Thorium	A	mg/kg	0.009959	4.87144485		0	0	0	0.1657240	5	5	0%	0	0	0%	J
Thorium 232	A	mg/kg	0.009959	4.87144485		0	0	0	0.1657240	0.1657240	5	0%	0	0	0%	B
Titanium	A	mg/kg	3.134	1532.9961		0	0	0	0.1912577	5	5	0%	0	0	0%	
Uranium	A	mg/kg	0.003096	1.5144084		0	0	0	0.0062660	5	5	0%	0	0	0%	J
Vanadium	A	mg/kg	0.09076	44.395254		0	0	0	0.8188371	1	5	0%	0	0	0%	
Barium	B	mg/kg	1.699	831.06585		0	0	0	0.0647537	5	5	0%	0	0	0%	
Barium as BaO	B	mg/kg	1.90288	930.793752		0	0	0	0.0725241	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L		41.5506331		0	0	0	0.0032375	0.249984	0	0%	0	0	0%	D
Beryllium	B	mg/kg	0.005057	2.47363155		0	0	0	0.0168072	5	5	0%	0	0	0%	J
Chromium	B	mg/kg	0.07513	36.7498395		0	0	0	0.578371	5	5	0%	0	0	0%	
Strontium	B	mg/kg	2.092	1023.3018		0	0	0	0.0250151	5	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg	2.46856	1207.49612		0	0	0	0.0295179	5.9	100000	0%	0	0	0%	
Zinc	B	mg/kg	0.0081	3.962115		0	0	0	1.1954826	5	5	0%	0	0	0%	J
Arsenic, TCLP equivalent (calc)	C	mg/L	0.00016255	0.07951133		0	0	0	0.0081737	0.25	0	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	C	mg/L	0.00002805	0.01372066		0	0	0	0.0016851	0.05	0	0%	0	0	0%	J
Chromium, TCLP equivalent (calc)	C	mg/L	0.0037565	1.83749198		0	0	0	0.0289185	0.25	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685675	B18020111-001	6010.20-S	SAMP		2/6/2018 5:34:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead, TCLP equivalent (calc)	C	mg/L	0.0005005	0.24481958		0	0	0	0.0109178	0.25	0	0%	0	0	0%	J
Selenium, TCLP equivalent (calc)	C	mg/L	0.0007225	0.35341088		0	0	0	0.0092645	0.25	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.0000093	0.0045491		0	0	0	0.0026228	0.25	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g	0.00108553	0.53098749		0	0	0	0.0180639	0.0180639	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	5.23378	2560.10349		0	0	0	0.3194003	8.35	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	0.00209599	1.02525449		0	0	0	0.0042421	3.385	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685676	B18020111-002	6010.20-S	SAMP		2/6/2018 5:37:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg	0.000337	0.161423		0	0	0	0.0534756	5	5	0%	0	0	0%	J
Arsenic	A	mg/kg	0.002724	1.304796		0	0	0	0.1600818	5	5	0%	0	0	0%	J
Cadmium	A	mg/kg	0.000501	0.239979		0	0	0	0.0330031	1	5	0%	0	0	0%	J
Cobalt	A	mg/kg	0.01047	5.01513		0	0	0	0.018317	5	5	0%	0	0	0%	
Copper	A	mg/kg	0.05145	24.64455		0	0	0	0.3200678	5	5	0%	0	0	0%	
Lead	A	mg/kg	0.005725	2.742275		0	0	0	0.2138256	5	5	0%	0	0	0%	J
Molybdenum	A	mg/kg	0.001339	0.641381		0	0	0	0.0448919	5	5	0%	0	0	0%	J
Nickel	A	mg/kg	0.01891	9.05789		0	0	0	0.0830778	5	5	0%	0	0	0%	
Selenium	A	mg/kg	0.01504	7.20416		0	0	0	0.1814452	5	5	0%	0	0	0%	
Silver	A	mg/kg	0.000155	0.074245		0	0	0	0.051368	5	1	0%	0	0	0%	J
Thallium	A	mg/kg	-0.000104	0		0	0	0	0.0227908	5	5	0%	0	0	0%	
Thorium	A	mg/kg	0.006519	3.122601		0	0	0	0.1622852	5	5	0%	0	0	0%	J
Thorium 232	A	mg/kg	0.006519	3.122601		0	0	0	0.1622852	0.1622852	5	0%	0	0	0%	B
Titanium	A	mg/kg	2.093	1002.547		0	0	0	0.187289	5	5	0%	0	0	0%	
Uranium	A	mg/kg	0.002573	1.232467		0	0	0	0.006136	5	5	0%	0	0	0%	J
Vanadium	A	mg/kg	0.06266	30.01414		0	0	0	0.801846	1	5	0%	0	0	0%	
Barium	B	mg/kg	1.834	878.486		0	0	0	0.0634100	5	5	0%	0	0	0%	
Barium as BaO	B	mg/kg	2.05408	983.90432		0	0	0	0.0710192	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L		43.9214888		0	0	0	0.0031703	0.249984	0	0%	0	0	0%	D
Beryllium	B	mg/kg	0.004616	2.211064		0	0	0	0.0164584	5	5	0%	0	0	0%	J
Chromium	B	mg/kg	0.04153	19.89287		0	0	0	0.5663696	5	5	0%	0	0	0%	
Strontium	B	mg/kg	2.069	991.051		0	0	0	0.0244961	5	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg	2.44142	1169.44018		0	0	0	0.0289054	5.9	100000	0%	0	0	0%	
Zinc	B	mg/kg	0.004753	2.276687		0	0	0	1.170676	5	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685676	B18020111-002	6010.20-S	SAMP		2/6/2018 5:37:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic, TCLP equivalent (calc)	C	mg/L	0.0001362	0.0652398		0	0	0	0.0080041	0.25	0	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	C	mg/L	0.00002505	0.01199895		0	0	0	0.0016502	0.05	0	0%	0	0	0%	J
Chromium, TCLP equivalent (calc)	C	mg/L	0.0020765	0.9946435		0	0	0	0.0283185	0.25	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.00028625	0.13711375		0	0	0	0.0106913	0.25	0	0%	0	0	0%	J
Selenium, TCLP equivalent (calc)	C	mg/L	0.000752	0.360208		0	0	0	0.0090723	0.25	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.00000775	0.00371225		0	0	0	0.0025684	0.25	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g	0.00071057	0.34036351		0	0	0	0.0176891	0.0176891	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	3.49531	1674.25349		0	0	0	0.3127726	8.35	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	0.00174192	0.83438016		0	0	0	0.0041541	3.385	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685677	B18020223-001	6010.20-S	SAMP		2/6/2018 5:40:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg	0.001396	0.345859		0	0	0	0.0276588	5	5	0%	0	0	0%	J
Arsenic	A	mg/kg	0.01814	4.494185		0	0	0	0.0827981	5	5	0%	0	0	0%	J
Cobalt	A	mg/kg	0.04056	10.04874		0	0	0	0.009474	5	5	0%	0	0	0%	
Copper	A	mg/kg	0.1075	26.633125		0	0	0	0.1655466	5	5	0%	0	0	0%	
Lead	A	mg/kg	0.04942	12.243805		0	0	0	0.1105956	5	5	0%	0	0	0%	
Molybdenum	A	mg/kg	0.001583	0.39218825		0	0	0	0.0232191	5	5	0%	0	0	0%	J
Nickel	A	mg/kg	0.07197	17.8305675		0	0	0	0.0429698	5	5	0%	0	0	0%	
Selenium	A	mg/kg	0.000588	0.145677		0	0	0	0.0938477	5	5	0%	0	0	0%	J
Thallium	A	mg/kg	0.000942	0.2333805		0	0	0	0.0117879	5	5	0%	0	0	0%	J
Thorium	A	mg/kg	0.0295	7.308625		0	0	0	0.0839377	5	5	0%	0	0	0%	
Thorium 232	A	mg/kg	0.0295	7.308625		0	0	0	0.0839377	0.0839377	5	0%	0	0	0%	
Titanium	A	mg/kg	2.365	585.92875		0	0	0	0.0968703	5	5	0%	0	0	0%	
Uranium	A	mg/kg	0.003968	0.983072		0	0	0	0.0031737	5	5	0%	0	0	0%	J
Vanadium	A	mg/kg	0.1391	34.462025		0	0	0	0.4147335	1	5	0%	0	0	0%	
Zinc	A	mg/kg	0.2704	66.9916		0	0	0	0.605501	5	5	0%	0	0	0%	
Barium	B	mg/kg	1.332	330.003		0	0	0	0.0327971	5	5	0%	0	0	0%	
Barium as BaO	B	mg/kg	1.49184	369.60336		0	0	0	0.0367328	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L		16.499094		0	0	0	0.0016398	0.249984	0	0%	0	0	0%	D
Beryllium	B	mg/kg	0.003805	0.94268875		0	0	0	0.0085127	5	5	0%	0	0	0%	J
Cadmium	B	mg/kg	0.00304	0.75316		0	0	0	0.01707	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L	0.000152	0.037658		0	0	0	0.0008535	0.05	0	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685677	B18020223-001	6010.20-S	SAMP		2/6/2018 5:40:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	B	mg/kg	0.07638	18.923145		0	0	0	0.2929396	5	5	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	B	mg/L	0.003819	0.94615725		0	0	0	0.014647	0.25	0	0%	0	0	0%	
Silver	B	mg/kg	0.000612	0.151623		0	0	0	0.0265687	5	1	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	B	mg/L	0.0000306	0.00758115		0	0	0	0.0013284	0.25	0	0%	0	0	0%	J
Strontium	B	mg/kg	0.2637	65.331675		0	0	0	0.0126699	5	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg	0.311166	77.0913765		0	0	0	0.0149505	5.9	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.000907	0.22470925		0	0	0	0.0041399	0.25	0	0%	0	0	0%	J
Lead, TCLP equivalent (calc)	C	mg/L	0.002471	0.61219025		0	0	0	0.0055298	0.25	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.0000294	0.00728385		0	0	0	0.0046924	0.25	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g	0.0032155	0.79664013		0	0	0	0.0091492	0.0091492	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	3.94955	978.501013		0	0	0	0.1617733	8.35	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	0.00268634	0.66553974		0	0	0	0.0021486	3.385	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685678	B18020223-002	6010.20-S	SAMP		2/6/2018 5:42:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg	0.001231	0.29734805		0	0	0	0.0269666	5	5	0%	0	0	0%	J
Arsenic	A	mg/kg	0.01639	3.9590045		0	0	0	0.0807260	5	5	0%	0	0	0%	J
Cobalt	A	mg/kg	0.04169	10.0702195		0	0	0	0.0092369	5	5	0%	0	0	0%	
Copper	A	mg/kg	0.09418	22.749179		0	0	0	0.1614037	5	5	0%	0	0	0%	
Lead	A	mg/kg	0.04739	11.4470545		0	0	0	0.1078279	5	5	0%	0	0	0%	
Molybdenum	A	mg/kg	0.001675	0.40459625		0	0	0	0.0226381	5	5	0%	0	0	0%	J
Nickel	A	mg/kg	0.06556	15.836018		0	0	0	0.0418944	5	5	0%	0	0	0%	
Selenium	A	mg/kg	0.000434	0.1048327		0	0	0	0.0914991	5	5	0%	0	0	0%	J
Thallium	A	mg/kg	0.000918	0.2217429		0	0	0	0.0114929	5	5	0%	0	0	0%	J
Thorium	A	mg/kg	0.0307	7.415585		0	0	0	0.0818371	5	5	0%	0	0	0%	
Thorium 232	A	mg/kg	0.0307	7.415585		0	0	0	0.0818371	0.0818371	5	0%	0	0	0%	
Titanium	A	mg/kg	2.766	668.1273		0	0	0	0.0944461	5	5	0%	0	0	0%	
Uranium	A	mg/kg	0.003951	0.95436405		0	0	0	0.0030943	5	5	0%	0	0	0%	J
Vanadium	A	mg/kg	0.1477	35.676935		0	0	0	0.4043547	1	5	0%	0	0	0%	
Zinc	A	mg/kg	0.2463	59.493765		0	0	0	0.5903482	5	5	0%	0	0	0%	
Barium	B	mg/kg	0.9742	235.31801		0	0	0	0.0319764	5	5	0%	0	0	0%	
Barium as BaO	B	mg/kg	1.091104	263.556171		0	0	0	0.0358136	5.6	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L		11.7651475		0	0	0	0.0015987	0.249984	0	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685678	B18020223-002	6010.20-S	SAMP		2/6/2018 5:42:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	B	mg/kg	0.003371	0.81426505		0	0	0	0.0082997	5	5	0%	0	0	0%	J
Cadmium	B	mg/kg	0.002783	0.67223365		0	0	0	0.0166428	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L	0.00013915	0.03361168		0	0	0	0.0008321	0.05	0	0%	0	0	0%	J
Chromium	B	mg/kg	0.07236	17.478558		0	0	0	0.2856087	5	5	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	B	mg/L	0.003618	0.8739279		0	0	0	0.0142804	0.25	0	0%	0	0	0%	
Silver	B	mg/kg	0.000457	0.11038835		0	0	0	0.0259038	5	1	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	B	mg/L	0.00002285	0.00551942		0	0	0	0.0012952	0.25	0	0%	0	0	0%	J
Strontium	B	mg/kg	0.2707	65.387585		0	0	0	0.0123529	5	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg	0.319426	77.1573503		0	0	0	0.0145764	5.9	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.0008195	0.19795023		0	0	0	0.0040363	0.25	0	0%	0	0	0%	J
Lead, TCLP equivalent (calc)	C	mg/L	0.0023695	0.57235273		0	0	0	0.0053914	0.25	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.0000217	0.00524164		0	0	0	0.004575	0.25	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g	0.0033463	0.80829877		0	0	0	0.0089202	0.0089202	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	4.61922	1115.77259		0	0	0	0.1577249	8.35	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	0.00267483	0.64610446		0	0	0	0.0020948	3.385	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685679	B18020223-002	6010.20-S	SD		2/6/2018 5:45:00	25	118184	2/5/2018 8:0	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	17.57	21220.1675		0	0	18309.49	8.289996	8.289996	5	0%			15%	R
Antimony	A	mg/kg	0.000187	0.22584925		0	0	0.2973481	0.1348332	1	5	0%				N
Arsenic	A	mg/kg	0.002929	3.53749975		0	0	3.9590045	0.4036301	1	5	0%				N
Barium	A	mg/kg	0.1886	227.78165		0	0	235.31801	0.1598819	1	5	0%			3%	
Beryllium	A	mg/kg	0.000654	0.7898685		0	0	0.8142651	0.0414983	1	5	0%				
Boron	A	mg/kg	0.01636	19.75879		0	0	13.075102	1.024172	1.024172	5	0%			41%	R
Cadmium	A	mg/kg	0.000488	0.589382		0	0	0.6722337	0.083214	1	5	0%				N
Chromium	A	mg/kg	0.0181	21.860275		0	0	17.478558	1.4280436	1.4280436	5	0%			22%	R
Cobalt	A	mg/kg	0.008241	9.95306775		0	0	10.07022	0.0461844	1	5	0%			1%	
Copper	A	mg/kg	0.01899	22.9351725		0	0	22.749179	0.8070186	1	5	0%			1%	
Lead	A	mg/kg	0.009264	11.188596		0	0	11.447055	0.5391396	1	5	0%			2%	
Manganese	A	mg/kg	0.5383	650.131825		0	0	632.861	0.5785123	1	5	0%			3%	
Molybdenum	A	mg/kg	0.000203	0.24517325		0	0	0.4045963	0.1131903	1	5	0%				N
Nickel	A	mg/kg	0.01398	16.884345		0	0	15.836018	0.2094722	1	5	0%			6%	
Selenium	A	mg/kg	0.000129	0		0	0	0.1048327	0.4574957	1	5	0%				

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685679	B18020223-002	6010.20-S	SD		2/6/2018 5:45:00	25	118184	2/5/2018 8:0	0	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/kg	0.000056	0		0	0	0.1103884	0.1295191	1	1	0%				
Strontium	A	mg/kg	0.05485	66.2450875		0	0	65.387585	0.0617643	1	5	0%			1%	
Thallium	A	mg/kg	0.000053	0.06401075		0	0	0.2217429	0.0574647	1	5	0%				N
Thorium	A	mg/kg	0.006264	7.565346		0	0	7.415585	0.4091857	1	5	0%			2%	
Thorium 232	A	mg/kg	0.006264	7.565346		0	0	7.415585	0.4091857	1	5	0%			2%	
Tin	A	mg/kg	0.001415	1.70896625		0	0	1.8688724	1.0348002	1.0348002	5	0%				N
Titanium	A	mg/kg	0.5561	671.629775		0	0	668.1273	0.4722303	1	5	0%			1%	
Uranium	A	mg/kg	0.000661	0.79832275		0	0	0.9543641	0.0154713	1	5	0%				
Vanadium	A	mg/kg	0.02862	34.565805		0	0	35.676935	2.0217735	2.0217735	5	0%			3%	
Zinc	A	mg/kg	0.05042	60.894755		0	0	59.493765	2.951741	2.951741	5	0%			2%	
Aluminum as Al2O3	C	mg/kg	33.2073	40106.1166		0	0	0	15.668092	15.668092	100000	0%				N
Arsenic, TCLP equivalent (calc)	C	mg/L	0.00014645	0.17687499		0	0	0.1979502	0.0201815	0.05	0	0%				N
Barium as BaO	C	mg/kg	0.211232	255.115448		0	0	263.55617	0.1790678	1.12	100000	0%			3%	
Barium, TCLP equivalent (calc)	C	mg/L		11.3883536		0	0	11.765147	0.0079936	0.0499968	0	0%			3%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.0000244	0.0294691		0	0	0.0336117	0.0041607	0.05	0	0%				N
Chromium, TCLP equivalent (calc)	C	mg/L	0.000905	1.09301375		0	0	0.8739279	0.0714022	0.0714022	0	0%			22%	
Lead, TCLP equivalent (calc)	C	mg/L	0.0004632	0.5594298		0	0	0.5723527	0.026957	0.05	0	0%			2%	
Manganese as MnO	C	mg/kg	0.683641	825.667418		0	0	0	0.7347106	1.27	100000	0%				N
Selenium, TCLP equivalent (calc)	C	mg/L	0.00000645	0		0	0	0.0052416	0.0228748	0.05	0	0%				
Silver, TCLP equivalent (calc)	C	mg/L	0.0000028	0		0	0	0.0055194	0.006476	0.05	0	0%				
Strontium as SrO	C	mg/kg	0.064723	78.1692033		0	0	77.157350	0.0728819	1.18	100000	0%			1%	
Thorium 232, Activity	C	pCi/g	0.00068278	0.82462271		0	0	0.8082988	0.0446012	0.109	100000	0%			2%	
Titanium as TiO2	C	mg/kg	0.928687	1121.62172		0	0	1115.7726	0.7886245	1.67	100000	0%			1%	
Uranium, Activity	C	pCi/g	0.0004475	0.54046450		0	0	0.6461045	0.0104741	0.677	3	0%				

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685680	B18020223-002	6010.20-S	PDS1		2/6/2018 5:48:00	5.1	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	72.76	17926.6816		12.31905	18309.49	0	1.6911592	5	5		75	125	0%	A
Antimony	A	mg/kg	0.05186	12.7773187		12.31905	0.2973481	0	0.027506	1	5	101%	75	125	0%	
Arsenic	A	mg/kg	0.06468	15.9359231		12.31905	3.9590045	0	0.0823405	1	5	97%	75	125	0%	
Barium	A	mg/kg	0.9832	242.241799		12.31905	235.31801	0	0.0326159	1	5		75	125	0%	A
Beryllium	A	mg/kg	0.04629	11.4049765		12.31905	0.8142651	0	0.0084657	1	5	86%	75	125	0%	
Boron	A	mg/kg	0.09287	22.8814035		12.31905	13.075102	0	0.2089311	1	5	80%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685680	B18020223-002	6010.20-S	PDS1		2/6/2018 5:48:00	5.1	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium	A	mg/kg	0.05122	12.6196348		12.31905	0.6722337	0	0.0169757	1	5	97%	75	125	0%	
Chromium	A	mg/kg	0.1172	28.8758532		12.31905	17.478558	0	0.2913209	1	5	93%	75	125	0%	
Cobalt	A	mg/kg	0.09127	22.4871939		12.31905	10.07022	0	0.0094216	1	5	101%	75	125	0%	
Copper	A	mg/kg	0.1372	33.8034732		12.31905	22.749179	0	0.1646318	1	5	90%	75	125	0%	
Lead	A	mg/kg	0.0971	23.9235951		12.31905	11.447055	0	0.1099845	1	5	101%	75	125	0%	
Manganese	A	mg/kg	2.578	635.170218		12.31905	632.861	0	0.1180165	1	5		75	125	0%	A
Molybdenum	A	mg/kg	0.05356	13.1961664		12.31905	0.4045963	0	0.0230908	1	5	104%	75	125	0%	
Nickel	A	mg/kg	0.1124	27.6932244		12.31905	15.836018	0	0.0427323	1	5	96%	75	125	0%	
Selenium	A	mg/kg	0.04778	11.7720842		12.31905	0.1048327	0	0.0933291	1	5	95%	75	125	0%	
Silver	A	mg/kg	0.0209	5.1493629		4.92762	0.1103884	0	0.0264219	1	1	102%	75	125	0%	
Strontium	A	mg/kg	0.3088	76.0824528		12.31905	65.387585	0	0.0125999	1	5		75	125	0%	A
Thallium	A	mg/kg	0.04908	12.0923795		12.31905	0.2217429	0	0.0117228	1	5	96%	75	125	0%	
Thorium	A	mg/kg	0.08496	20.9325298		12.31905	7.415585	0	0.0834739	1	5	110%	75	125	0%	
Thorium 232	A	mg/kg	0.08496	20.9325298		12.31905	7.415585	0	0.0834739	1	5	110%	75	125	0%	
Tin	A	mg/kg	0.06021	14.8346000		12.31905	1.8688724	0	0.2110992	1	5	105%	75	125	0%	
Titanium	A	mg/kg	2.708	667.199748		12.31905	668.1273	0	0.096335	1	5		75	125	0%	A
Uranium	A	mg/kg	0.05757	14.1841542		12.31905	0.9543641	0	0.0031561	1	5	107%	75	125	0%	
Vanadium	A	mg/kg	0.1932	47.6008092		12.31905	35.676935	0	0.4124418	1	5	97%	75	125	0%	
Zinc	A	mg/kg	0.2778	68.4446418		12.31905	59.493765	0	0.6021552	1	5		75	125	0%	A
Aluminum as Al2O3	C	mg/kg	137.5164	33881.4281		0	0	0	3.1962909	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.003234	0.79679615		0	0.1979502	0	0.0041170	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	1.101184	271.310815		0	263.55617	0	0.0365298	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		12.1113148		0	11.765147	0	0.0016307	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.002561	0.63098174		0	0.0336117	0	0.0008488	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.00586	1.44379266		0	0.8739279	0	0.0145660	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.004855	1.19617976		0	0.5723527	0	0.0054992	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	3.27406	806.666177		0	0	0	0.149881	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.002389	0.58860421		0	0.0052416	0	0.0046665	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.001045	0.25746815		0	0.0055194	0	0.0013211	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	0.364384	89.7772943		0	77.157350	0	0.0148679	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	0.00926064	2.28164574		0	0.8082988	0	0.0090987	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	4.52236	1114.22358		0	1115.7726	0	0.1608794	1.67	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g	0.03897489	9.60267237		0	0.6461045	0	0.0021367	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685681	SRM-118184	6010.20-S	SRM		2/6/2018 5:50:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	37.37	8823.057		8780	0	0	1.6205904	5	5	100%	11	189	0%	
Antimony	A	mg/kg	0.09396	22.183956		48	0	0	0.0263582	1	5	46%	0	238	0%	
Arsenic	A	mg/kg	0.5265	124.30665		123	0	0	0.0789046	1	5	101%	87	112	0%	
Barium	A	mg/kg	1.178	278.1258		253	0	0	0.0312549	1	5	110%	65	134	0%	
Beryllium	A	mg/kg	0.8047	189.98967		192	0	0	0.0081124	1	5	99%	82	118	0%	
Boron	A	mg/kg	0.5772	136.27692		139	0	0	0.2002128	1	5	98%	78	122	0%	
Cadmium	A	mg/kg	1.005	237.2805		224	0	0	0.0162673	1	5	106%	87	112	0%	
Chromium	A	mg/kg	0.8056	190.20216		179	0	0	0.2791646	1	5	106%	86	114	0%	
Cobalt	A	mg/kg	0.2761	65.18721		60.1	0	0	0.0090285	1	5	108%	84	116	0%	
Copper	A	mg/kg	0.3399	80.25039		78.9	0	0	0.1577620	1	5	102%	84	116	0%	
Lead	A	mg/kg	0.6401	151.12761		145	0	0	0.1053950	1	5	104%	80	120	0%	
Manganese	A	mg/kg	1.433	338.3313		335	0	0	0.1130919	1	5	101%	62	138	0%	
Molybdenum	A	mg/kg	0.2475	58.43475		57.8	0	0	0.0221273	1	5	101%	80	120	0%	
Nickel	A	mg/kg	0.6383	150.70263		143	0	0	0.0409492	1	5	105%	84	112	0%	
Selenium	A	mg/kg	0.1853	43.74933		42.4	0	0	0.0894347	1	5	103%	79	121	0%	
Silver	A	mg/kg	0.3938	92.97618		81.6	0	0	0.0253194	1	1	114%	83	117	0%	
Strontium	A	mg/kg	1.469	346.8309		359	0	0	0.0120742	1	5	97%	65	135	0%	
Thallium	A	mg/kg	0.2257	53.28777		52	0	0	0.0112336	1	5	102%	78	122	0%	
Thorium	A	mg/kg	0.01444	3.409284		0	0	0	0.0799907	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg	0.01444	3.409284		0	0	0	0.0799907	1	5	0%	0	0	0%	
Tin	A	mg/kg	0.5754	135.85194		123	0	0	0.2022905	1	5	110%	78	122	0%	
Titanium	A	mg/kg	0.52	122.772		119	0	0	0.0923151	1	5	103%	14	187	0%	
Uranium	A	mg/kg	0.005768	1.3618248		0	0	0	0.0030244	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	0.3108	73.37988		72.3	0	0	0.3952314	1	5	101%	81	119	0%	
Zinc	A	mg/kg	3.208	757.4088		770	0	0	0.5770284	1	5	98%	83	117	0%	
Aluminum as Al2O3	C	mg/kg	70.6293	16675.5777		0	0	0	3.0629159	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.026325	6.2153325		0	0	0	0.0039452	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	1.31936	311.500896		0	0	0	0.0350055	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		13.9054		0	0	0	0.0015626	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.05025	11.864025		0	0	0	0.0008134	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.04028	9.510108		0	0	0	0.0139582	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.032005	7.5563805		0	0	0	0.0052698	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	1.81991	429.680751		0	0	0	0.1436267	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.009265	2.1874665		0	0	0	0.0044717	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.01969	4.648809		0	0	0	0.001266	0.05	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685681	SRM-118184	6010.20-S	SRM		2/6/2018 5:50:00	5	118184	2/5/2018 8:0	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium as SrO	C	mg/kg	1.73342	409.260462		0	0	0	0.0142475	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	0.00157396	0.37161196		0	0	0	0.008719	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.8684	205.02924		0	0	0	0.1541662	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	0.00390494	0.92195539		0	0	0	0.0020475	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685682	CCV	ICPMS-6020-W-	CCV		2/6/2018 5:53:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.1521	0.1521		0.05	0	0	0.0002849	0.1	4.5	304%	90	110	0%	S
Antimony	A	mg/L	0.05127	0.05127		0.05	0	0	3.047E-05	0.05	18	103%	90	110	0%	
Arsenic	A	mg/L	0.05153	0.05153		0.05	0	0	6.629E-05	0.005	18	103%	90	110	0%	
Barium	A	mg/L	0.05353	0.05353		0.05	0	0	6.437E-05	0.1	18	107%	90	110	0%	
Beryllium	A	mg/L	0.05114	0.05114		0.05	0	0	8.97E-06	0.001	4.5	102%	90	110	0%	
Boron	A	mg/L	0.05688	0.05688		0.05	0	0	0.00141	0.1	4.5	114%	90	110	0%	S
Cadmium	A	mg/L	0.05104	0.05104		0.05	0	0	1.468E-05	0.001	18	102%	90	110	0%	
Cerium	A	mg/L	0.05075	0.05075		0.05	0	0	2.257E-05	0.001	4.5	101%	90	110	0%	
Chromium	A	mg/L	0.0544	0.0544		0.05	0	0	5.576E-05	0.01	18	109%	90	110	0%	
Cobalt	A	mg/L	0.05234	0.05234		0.05	0	0	3.904E-05	0.01	18	105%	90	110	0%	
Copper	A	mg/L	0.05117	0.05117		0.05	0	0	7.681E-05	0.01	4.5	102%	90	110	0%	
Iron	A	mg/L	1.451	1.451		1.3	0	0	0.000175	0.02	4.5	112%	90	110	0%	S
Lanthanum	A	mg/L	0.05183	0.05183		0.05	0	0	0.0000111	0.001	4.5	104%	90	110	0%	
Lead	A	mg/L	0.05144	0.05144		0.05	0	0	2.956E-05	0.01	18	103%	90	110	0%	
Manganese	A	mg/L	0.05534	0.05534		0.05	0	0	3.649E-05	0.01	18	111%	90	110	0%	S
Mercury	A	mg/L	0.001114	0.001114		0.001	0	0	1.289E-05	0.001	0.36	111%	90	110	0%	S
Molybdenum	A	mg/L	0.05108	0.05108		0.05	0	0	2.302E-05	0.005	9	102%	90	110	0%	
Nickel	A	mg/L	0.05331	0.05331		0.05	0	0	7.128E-05	0.01	4.5	107%	90	110	0%	
Selenium	A	mg/L	0.05224	0.05224		0.05	0	0	0.0001532	0.005	18	104%	90	110	0%	
Silver	A	mg/L	0.02088	0.02088		0.02	0	0	2.959E-05	0.005	1.8	104%	90	110	0%	
Strontium	A	mg/L	0.05197	0.05197		0.05	0	0	1.229E-05	0.1	18	104%	90	110	0%	
Thallium	A	mg/L	0.04999	0.04999		0.05	0	0	1.434E-05	0.1	18	100%	90	110	0%	
Thorium	A	mg/L	0.04895	0.04895		0.05	0	0	5.767E-05	0.001	4.5	98%	90	110	0%	
Thorium 232	A	mg/L	0.04895	0.04895		0.05	0	0	5.767E-05	0.01	4.5	98%	90	110	0%	
Tin	A	mg/L	0.05241	0.05241		0.05	0	0	5.199E-05	0.1	9	105%	90	110	0%	
Titanium	A	mg/L	0.05247	0.05247		0.05	0	0	0.0001736	0.01	18	105%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685682	CCV	ICPMS-6020-W-	CCV		2/6/2018 5:53:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	mg/L	0.05169	0.05169		0.05	0	0	1.332E-05	0.001	4.5	103%	90	110	0%	
Vanadium	A	mg/L	0.05225	0.05225		0.05	0	0	7.351E-05	0.1	18	104%	90	110	0%	
Zinc	A	mg/L	0.05233	0.05233		0.05	0	0	0.0002495	0.01	4.5	105%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685683	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 5:55:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000057	0.000057		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000179	0.000179		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000973	0.000973		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000209	0.000209		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000303	0.000303		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000149	0.000149		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.001946	0.001946		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000047	0.000047		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000115	0.000115		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000095	0.000095		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000789	0.000789		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000281	0.000281		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000505	0.000505		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000239	0.000239		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000349	0.000349		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000839	0.000839		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000121	0.000121		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000146	0.000146		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000146	0.000146		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000411	0.000411		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.001925	0.001925		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	-0.000027	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000085	0.000085		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.00117	0.00117		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685684	CCB	ICPMS-6020-W-	CCB		2/6/2018 5:58:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04204	0.04204		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000048	-0.000048		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000048	0.000048		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000633	0.000633		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000023	0.000023		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.001543	0.001543		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000125	0.000125		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000081	0.000081		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.001273	0.001273		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000089	-0.000089		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000001	-0.000001		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.0472	0.0472		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000047	0.000047		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000394	0.000394		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.001236	0.001236		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000058	0.000058		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000057	-0.000057		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000032	0.000032		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.00006	-0.00006		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000095	0.000095		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000472	0.000472		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.000059	0.000059		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000111	-0.000111		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000111	-0.000111		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000022	-0.000022		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.001189	0.001189		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000105	-0.000105		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000079	0.000079		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000558	0.000558		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685685	B18020223-002	6010.20-S	MS3		2/6/2018 6:01:00	5	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685685	B18020223-002	6010.20-S	MS3		2/6/2018 6:01:00	5	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	79.6	19641.3		246.75	18309.49	0	1.693692	5	5		75	125	0%	A
Antimony	A	mg/kg	0.04602	11.355435		49.35	0.2973481	0	0.0275472	1	5	22%	75	125	0%	S
Arsenic	A	mg/kg	0.1783	43.995525		49.35	3.9590045	0	0.0824639	1	5	81%	75	125	0%	
Barium	A	mg/kg	1.001	246.99675		49.35	235.31801	0	0.0326648	1	5		75	125	0%	A
Beryllium	A	mg/kg	0.08068	19.90779		24.675	0.8142651	0	0.0084783	1	5	77%	75	125	0%	
Boron	A	mg/kg	0.2058	50.78115		49.35	13.075102	0	0.209244	1	5	76%	75	125	0%	
Cadmium	A	mg/kg	0.08926	22.024905		24.675	0.6722337	0	0.0170011	1	5	87%	75	125	0%	
Chromium	A	mg/kg	0.2333	57.566775		49.35	17.478558	0	0.2917572	1	5	81%	75	125	0%	
Cobalt	A	mg/kg	0.2083	51.398025		49.35	10.07022	0	0.0094357	1	5	84%	75	125	0%	
Copper	A	mg/kg	0.2465	60.823875		49.35	22.749179	0	0.1648784	1	5	77%	75	125	0%	
Lead	A	mg/kg	0.2178	53.74215		49.35	11.447055	0	0.1101492	1	5	86%	75	125	0%	
Manganese	A	mg/kg	2.89	713.1075		246.75	632.861	0	0.1181933	1	5	33%	75	125	0%	S
Molybdenum	A	mg/kg	0.1487	36.691725		49.35	0.4045963	0	0.0231254	1	5	74%	75	125	0%	S
Nickel	A	mg/kg	0.2283	56.333025		49.35	15.836018	0	0.0427963	1	5	82%	75	125	0%	
Selenium	A	mg/kg	0.1627	40.146225		49.35	0.1048327	0	0.0934689	1	5	81%	75	125	0%	
Silver	A	mg/kg	0.09661	23.8385175		24.675	0.1103884	0	0.0264615	1	1	96%	75	125	0%	
Strontium	A	mg/kg	0.399	98.45325		49.35	65.387585	0	0.0126188	1	5	67%	75	125	0%	S
Thallium	A	mg/kg	0.1741	42.959175		49.35	0.2217429	0	0.0117404	1	5	87%	75	125	0%	
Thorium	A	mg/kg	0.2176	53.6928		49.35	7.415585	0	0.0835989	1	5	94%	75	125	0%	
Thorium 232	A	mg/kg	0.2176	53.6928		49.35	7.415585	0	0.0835989	1	5	94%	75	125	0%	
Tin	A	mg/kg	0.1744	43.0332		49.35	1.8688724	0	0.2114154	1	5	83%	75	125	0%	
Titanium	A	mg/kg	3.219	794.28825		49.35	668.1273	0	0.0964793	1	5		75	125	0%	A
Uranium	A	mg/kg	0.1835	45.278625		49.35	0.9543641	0	0.0031609	1	5	90%	75	125	0%	
Vanadium	A	mg/kg	0.3001	74.049675		49.35	35.676935	0	0.4130595	1	5	78%	75	125	0%	
Zinc	A	mg/kg	0.387	95.49225		49.35	59.493765	0	0.603057	1	5	73%	75	125	0%	S
Aluminum as Al2O3	C	mg/kg	150.444	37122.057		0	0	0	3.2010779	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.008915	2.19977625		0	0.1979502	0	0.0041232	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	1.12112	276.63636		0	263.55617	0	0.0365845	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		12.3490471		0	11.765147	0	0.0016331	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.004463	1.10124525		0	0.0336117	0	0.0008501	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.011665	2.87833875		0	0.8739279	0	0.0145879	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.01089	2.6871075		0	0.5723527	0	0.0055075	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	3.6703	905.646525		0	0	0	0.1501054	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.008135	2.00731125		0	0.0052416	0	0.0046734	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.0048305	1.19192588		0	0.0055194	0	0.0013231	0.05	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685685	B18020223-002	6010.20-S	MS3		2/6/2018 6:01:00	5	118184	2/5/2018 8:0	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium as SrO	C	mg/kg	0.47082	116.174835		0	77.157350	0	0.0148902	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	0.0237184	5.8525152		0	0.8082988	0	0.0091123	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	5.37573	1326.46138		0	1115.7726	0	0.1611203	1.67	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g	0.1242295	30.6536291		0	0.6461045	0	0.0021399	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685686	B18020223-002	6010.20-S	MSD3		2/6/2018 6:03:00	5	118184	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	93.26	23212.414		248.875	18309.49	19641.3	1.7084496	5	5		75	125	17%	A
Antimony	A	mg/kg	0.05368	13.360952		49.775	0.2973481	11.355435	0.0277872	1	5	26%	75	125	16%	S
Arsenic	A	mg/kg	0.2055	51.14895		49.775	3.9590045	43.995525	0.0831824	1	5	95%	75	125	15%	
Barium	A	mg/kg	1.201	298.9289		49.775	235.31801	246.99675	0.0329494	1	5		75	125	19%	A
Beryllium	A	mg/kg	0.09257	23.040673		24.8875	0.8142651	19.90779	0.0085522	1	5	89%	75	125	15%	
Boron	A	mg/kg	0.233	57.9937		49.775	13.075102	50.78115	0.2110672	1	5	90%	75	125	13%	
Cadmium	A	mg/kg	0.1018	25.33802		24.8875	0.6722337	22.024905	0.0171492	1	5	99%	75	125	14%	
Chromium	A	mg/kg	0.2753	68.52217		49.775	17.478558	57.566775	0.2942994	1	5	103%	75	125	17%	
Cobalt	A	mg/kg	0.243	60.4827		49.775	10.07022	51.398025	0.0095179	1	5	101%	75	125	16%	
Copper	A	mg/kg	0.2871	71.45919		49.775	22.749179	60.823875	0.166315	1	5	98%	75	125	16%	
Lead	A	mg/kg	0.2463	61.30407		49.775	11.447055	53.74215	0.111109	1	5	100%	75	125	13%	
Manganese	A	mg/kg	3.517	875.3813		248.875	632.861	713.1075	0.1192231	1	5	97%	75	125	20%	R
Molybdenum	A	mg/kg	0.1757	43.73173		49.775	0.4045963	36.691725	0.0233269	1	5	87%	75	125	18%	
Nickel	A	mg/kg	0.2702	67.25278		49.775	15.836018	56.333025	0.0431692	1	5	103%	75	125	18%	
Selenium	A	mg/kg	0.1863	46.37007		49.775	0.1048327	40.146225	0.0942833	1	5	93%	75	125	14%	
Silver	A	mg/kg	0.1081	26.90609		24.8875	0.1103884	23.838518	0.0266920	1	1	108%	75	125	12%	
Strontium	A	mg/kg	0.4698	116.93322		49.775	65.387585	98.45325	0.0127287	1	5	104%	75	125	17%	
Thallium	A	mg/kg	0.1951	48.56039		49.775	0.2217429	42.959175	0.0118427	1	5	97%	75	125	12%	
Thorium	A	mg/kg	0.2376	59.13864		49.775	7.415585	53.6928	0.0843273	1	5	104%	75	125	10%	
Thorium 232	A	mg/kg	0.2376	59.13864		49.775	7.415585	53.6928	0.0843273	1	5	104%	75	125	10%	
Tin	A	mg/kg	0.2064	51.37296		49.775	1.8688724	43.0332	0.2132575	1	5	99%	75	125	18%	
Titanium	A	mg/kg	3.868	962.7452		49.775	668.1273	794.28825	0.0973199	1	5		75	125	19%	A
Uranium	A	mg/kg	0.2119	52.74191		49.775	0.9543641	45.278625	0.0031884	1	5	104%	75	125	15%	
Vanadium	A	mg/kg	0.3496	87.01544		49.775	35.676935	74.049675	0.4166586	1	5	103%	75	125	16%	
Zinc	A	mg/kg	0.4403	109.59067		49.775	59.493765	95.49225	0.6083116	1	5	101%	75	125	14%	
Aluminum as Al2O3	C	mg/kg	176.2614	43871.4625		0	0	37122.057	3.2289697	9.45	100000	0%	0	0	17%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685686	B18020223-002	6010.20-S	MSD3		2/6/2018 6:03:00	5	118184	2/5/2018 8:0	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic, TCLP equivalent (calc)	C	mg/L	0.010275	2.5574475		0	0.1979502	2.1997763	0.0041591	0.05	0	0%	0	0	15%	
Barium as BaO	C	mg/kg	1.34512	334.800368		0	263.55617	276.63636	0.0369033	1.12	100000	0%	0	0	19%	
Barium, TCLP equivalent (calc)	C	mg/L		14.9454884		0	11.765147	12.349047	0.0016474	0.0499968	0	0%	0	0	19%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.00509	1.266901		0	0.0336117	1.1012453	0.0008575	0.05	0	0%	0	0	14%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.013765	3.4261085		0	0.8739279	2.8783388	0.014715	0.05	0	0%	0	0	17%	
Lead, TCLP equivalent (calc)	C	mg/L	0.012315	3.0652035		0	0.5723527	2.6871075	0.0055554	0.05	0	0%	0	0	13%	
Manganese as MnO	C	mg/kg	4.46659	1111.73425		0	0	905.64653	0.1514133	1.27	100000	0%	0	0	20%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.009315	2.3185035		0	0.0052416	2.0073113	0.0047142	0.05	0	0%	0	0	14%	
Silver, TCLP equivalent (calc)	C	mg/L	0.005405	1.3453045		0	0.0055194	1.1919259	0.0013346	0.05	0	0%	0	0	12%	
Strontium as SrO	C	mg/kg	0.554364	137.9812		0	77.157350	116.17484	0.0150199	1.18	100000	0%	0	0	17%	
Thorium 232, Activity	C	pCi/g	0.0258984	6.44611176		0	0.8082988	5.8525152	0.0091917	0.109	100000	0%	0	0	10%	
Titanium as TiO2	C	mg/kg	6.45956	1607.78448		0	1115.7726	1326.4614	0.1625242	1.67	100000	0%	75	0	19%	
Uranium, Activity	C	pCi/g	0.1434563	35.7062731		0	0.6461045	30.653629	0.0021586	0.677	3	0%	0	0	15%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685687	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 6:06:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000019	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000292	0.000292		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.001389	0.001389		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000027	0.000027		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000128	0.000128		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000445	0.000445		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000606	0.000606		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000151	0.000151		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000314	0.000314		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.00031	0.00031		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000729	0.000729		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000245	0.000245		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000326	0.000326		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.00056	0.00056		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000196	0.000196		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000659	0.000659		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000334	0.000334		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685687	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 6:06:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thorium	A	mg/L	0.000368	0.000368		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000368	0.000368		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.00004	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.004438	0.004438		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000119	0.000119		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000209	0.000209		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000764	0.000764		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685688	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 6:09:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000062	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000092	0.000092		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000714	0.000714		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000009	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000079	0.000079		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000232	0.000232		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000337	0.000337		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000024	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000043	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000163	0.000163		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000742	0.000742		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000014	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000198	0.000198		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000184	0.000184		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000063	0.000063		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000363	0.000363		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000143	0.000143		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	-0.000011	0		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000011	0		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000153	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.002222	0.002222		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.00001	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.00014	0.00014		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685688	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 6:09:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/L	0.000463	0.000463		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685689	MB-118169	6010.20-S	MBLK		2/6/2018 6:11:00	2	118169	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.04512	4.512		0	0	0	0.6864	5	5	0%	0	0	0%	
Antimony	A	mg/kg	0.000035	0		0	0	0	0.011164	1	5	0%	0	0	0%	
Arsenic	A	mg/kg	-0.00054	0		0	0	0	0.03342	1	5	0%	0	0	0%	
Barium	A	mg/kg	0.00049	0.049		0	0	0	0.013238	1	5	0%	0	0	0%	
Beryllium	A	mg/kg	-0.000073	0		0	0	0	0.003436	1	5	0%	0	0	0%	
Boron	A	mg/kg	0.001125	0.1125		0	0	0	0.0848	1	5	0%	0	0	0%	
Cadmium	A	mg/kg	-0.000118	0		0	0	0	0.00689	1	5	0%	0	0	0%	
Chromium	A	mg/kg	0.005417	0.5417		0	0	0	0.11824	1	5	0%	0	0	0%	
Cobalt	A	mg/kg	-0.000125	0		0	0	0	0.003824	1	5	0%	0	0	0%	
Copper	A	mg/kg	0.000367	0		0	0	0	0.06682	1	5	0%	0	0	0%	
Lead	A	mg/kg	0.000302	0		0	0	0	0.04464	1	5	0%	0	0	0%	
Manganese	A	mg/kg	0.001514	0.1514		0	0	0	0.0479	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg	0.000103	0.0103		0	0	0	0.009372	1	5	0%	0	0	0%	
Nickel	A	mg/kg	0.000253	0.0253		0	0	0	0.017344	1	5	0%	0	0	0%	
Selenium	A	mg/kg	0.000255	0		0	0	0	0.03788	1	5	0%	0	0	0%	
Silver	A	mg/kg	0.000443	0.0443		0	0	0	0.010724	1	1	0%	0	0	0%	
Strontium	A	mg/kg	0.000201	0.0201		0	0	0	0.005114	1	5	0%	0	0	0%	
Thallium	A	mg/kg	0.00011	0.011		0	0	0	0.004758	1	5	0%	0	0	0%	
Thorium	A	mg/kg	0.002469	0.2469		0	0	0	0.03388	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg	0.002469	0.2469		0	0	0	0.03388	1	5	0%	0	0	0%	
Tin	A	mg/kg	0.01158	1.158		0	0	0	0.08568	1	5	0%	0	0	0%	
Titanium	A	mg/kg	0.001975	0.1975		0	0	0	0.0391	1	5	0%	0	0	0%	
Uranium	A	mg/kg	-0.000057	0		0	0	0	0.001281	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	0.000424	0		0	0	0	0.1674	1	5	0%	0	0	0%	
Zinc	A	mg/kg	0.001435	0		0	0	0	0.2444	1	5	0%	0	0	0%	
Aluminum as Al2O3	C	mg/kg	0.0852768	8.52768		0	0	0	1.297296	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	-0.000027	0		0	0	0	0.001671	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	0.0005488	0.05488		0	0	0	0.0148266	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		0.00244984		0	0	0	0.0006619	0.0499968	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685689	MB-118169	6010.20-S	MBLK		2/6/2018 6:11:00	2	118169	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium, TCLP equivalent (calc)	C	mg/L	-0.0000059	0		0	0	0	0.0003445	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.00027085	0.027085		0	0	0	0.005912	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.0000151	0		0	0	0	0.002232	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	0.00192278	0.192278		0	0	0	0.060833	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.00001275	0		0	0	0	0.001894	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.00002215	0.002215		0	0	0	0.0005362	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	0.00023718	0.023718		0	0	0	0.0060345	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	0.00026912	0.0269121		0	0	0	0.0036929	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.00329825	0.329825		0	0	0	0.065297	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	-3.859E-05	0		0	0	0	0.0008672	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685690	B18020067-001	6010.20-S	SAMP		2/6/2018 6:14:00	5	118169	2/5/2018 7:5	0	0	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000029	0		0	0	0	0.0271014	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.004239	1.02904843		0	0	0	0.0811295	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.01213	2.94464671		0	0	0	0.2870363	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.007232	1.75562119		0	0	0	0.0092830	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.006063	1.47183784		0	0	0	0.1622105	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.0119	2.88881252		0	0	0	0.1083669	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.000269	0.06530173		0	0	0	0.0227512	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.01167	2.83297833		0	0	0	0.0421038	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000269	0		0	0	0	0.0919565	1	5	0%	0	0	0%	
Silver	A	mg/kg-dr	0.000094	0		0	0	0	0.0260333	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	0.00009	0.02184816		0	0	0	0.0115504	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.007516	1.82456428		0	0	0	0.0822462	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.007516	1.82456428		0	0	0	0.0822462	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.158	38.3556620		0	0	0	0.0949181	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.001042	0.25295316		0	0	0	0.0031097	1	5	0%	0	0	0%	J
Vanadium	A	mg/kg-dr	0.0274	6.65155151		0	0	0	0.4063758	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.0399	9.68601845		0	0	0	0.593299	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.1994	48.4058165		0	0	0	0.0321362	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.223328	54.2145145		0	0	0	0.0359926	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		2.42013593		0	0	0	0.0016067	0.0499968	0	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685690	B18020067-001	6010.20-S	SAMP		2/6/2018 6:14:00	5	118169	2/5/2018 7:5	0	0	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	B	mg/kg-dr	0.000911	0.22115195		0	0	0	0.0083411	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.00021	0.05097904		0	0	0	0.016726	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000105	0.00254895		0	0	0	0.0008363	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg-dr	0.04947	12.0092063		0	0	0	0.0124146	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.0583746	14.1708635		0	0	0	0.0146492	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.00021195	0.05145242		0	0	0	0.0040565	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0006065	0.14723234		0	0	0	0.0143518	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.000595	0.14444063		0	0	0	0.0054183	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00001345	0		0	0	0	0.0045978	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000047	0		0	0	0	0.0013017	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00081924	0.19887751		0	0	0	0.0089648	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.26386	64.0539556		0	0	0	0.1585133	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00070543	0.17124929		0	0	0	0.0021053	0.677	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685691	B18020067-002	6010.20-S	SAMP		2/6/2018 6:17:00	5	118169	2/5/2018 7:5	0	0	9.64

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000049	0		0	0	0	0.0292629	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.004514	1.18320152		0	0	0	0.0875999	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.009009	2.36142279		0	0	0	0.3099286	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.007559	1.98135141		0	0	0	0.0100234	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.00568	1.48883133		0	0	0	0.1751474	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.01109	2.90689075		0	0	0	0.1170096	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.000702	0.18400697		0	0	0	0.0245657	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.008844	2.31817329		0	0	0	0.0454618	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000524	0.13734993		0	0	0	0.0992904	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.00003	0		0	0	0	0.0281096	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	0.000012	0		0	0	0	0.0124716	1	5	0%	0	0	0%	
Thorium	A	mg/kg-dr	0.007122	1.86680576		0	0	0	0.0888056	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.007122	1.86680576		0	0	0	0.0888056	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.2803	73.4717293		0	0	0	0.1024882	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.001968	0.51584860		0	0	0	0.0033577	1	5	0%	0	0	0%	J
Vanadium	A	mg/kg-dr	0.02858	7.49133793		0	0	0	0.4387859	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.04254	11.1505079		0	0	0	0.6406169	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685691	B18020067-002	6010.20-S	SAMP		2/6/2018 6:17:00	5	118169	2/5/2018 7:5	0	0	9.64

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	B	mg/kg-dr	0.4176	109.460557		0	0	0	0.0346992	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.467712	122.595824		0	0	0	0.0388631	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		5.47267758		0	0	0	0.0017348	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.000587	0.15386338		0	0	0	0.0090064	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.00026	0.06815073		0	0	0	0.0180599	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.000013	0.00340754		0	0	0	0.000903	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg-dr	0.06409	16.7991549		0	0	0	0.0134047	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.0756262	19.8230028		0	0	0	0.0158176	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0002257	0.05916008		0	0	0	0.00438	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.00045045	0.11807114		0	0	0	0.0154964	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0005545	0.14534454		0	0	0	0.0058505	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0000262	0.0068675		0	0	0	0.0049645	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000015	0		0	0	0	0.0014055	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.0007763	0.20348183		0	0	0	0.0096798	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.468101	122.697788		0	0	0	0.1711553	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00133234	0.34922950		0	0	0	0.0022732	0.677	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685692	B18020068-001	6010.20-S	SAMP		2/6/2018 6:19:00	5	118169	2/5/2018 7:5	0	0	8.11

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000034	0		0	0	0	0.0302579	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.005229	1.41721891		0	0	0	0.0905784	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.01172	3.17647842		0	0	0	0.3204666	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.006687	1.81238150		0	0	0	0.0103642	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.007712	2.09018785		0	0	0	0.1811026	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.01248	3.38246166		0	0	0	0.1209881	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.001145	0.31033002		0	0	0	0.025401	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.01061	2.87563447		0	0	0	0.0470075	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000412	0.1116646		0	0	0	0.1026664	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000017	0		0	0	0	0.0290653	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	0.000045	0		0	0	0	0.0128956	1	5	0%	0	0	0%	
Thorium	A	mg/kg-dr	0.01027	2.78348408		0	0	0	0.0918252	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.01027	2.78348408		0	0	0	0.0918252	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.2066	55.9949182		0	0	0	0.105973	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685692	B18020068-001	6010.20-S	SAMP		2/6/2018 6:19:00	5	118169	2/5/2018 7:5	0	0	8.11

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	mg/kg-dr	0.002227	0.60358511		0	0	0	0.0034719	1	5	0%	0	0	0%	J
Vanadium	A	mg/kg-dr	0.02775	7.52109865		0	0	0	0.4537052	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.04771	12.9308691		0	0	0	0.6623987	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.2338	63.3669500		0	0	0	0.0358790	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.261856	70.9709840		0	0	0	0.0401845	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		3.16814473		0	0	0	0.0017938	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.000714	0.19351584		0	0	0	0.0093126	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000224	0.06071085		0	0	0	0.0186740	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000112	0.00303554		0	0	0	0.0009337	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg-dr	0.1338	36.2638919		0	0	0	0.0138605	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.157884	42.7913924		0	0	0	0.0163554	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.00026145	0.07086095		0	0	0	0.0045289	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.000586	0.15882392		0	0	0	0.0160233	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.000624	0.16912308		0	0	0	0.0060494	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0000206	0.00558323		0	0	0	0.0051333	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.00000085	0		0	0	0	0.0014533	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00111943	0.30339976		0	0	0	0.0100089	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.345022	93.5115134		0	0	0	0.1769748	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00150768	0.40862712		0	0	0	0.0023505	0.677	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685693	B18020068-002	6010.20-S	SAMP		2/6/2018 6:22:00	5	118169	2/5/2018 7:5	0	0	23.57

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000424	0.13339108		0	0	0	0.0351221	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.007854	2.47088093		0	0	0	0.1051399	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.0544	17.1143268		0	0	0	0.3719849	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.0376	11.82902		0	0	0	0.0120304	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.04855	15.2739074		0	0	0	0.2102168	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.05675	17.8536405		0	0	0	0.1404382	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.001185	0.37280289		0	0	0	0.0294845	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.06015	18.9232859		0	0	0	0.0545645	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.001483	0.46655417		0	0	0	0.1191711	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000148	0.04656104		0	0	0	0.0337379	1	1	0%	0	0	0%	J
Thallium	A	mg/kg-dr	0.000439	0.13811010		0	0	0	0.0149687	1	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685693	B18020068-002	6010.20-S	SAMP		2/6/2018 6:22:00	5	118169	2/5/2018 7:5	0	0	23.57

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thorium	A	mg/kg-dr	0.02923	9.19580462		0	0	0	0.1065870	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.02923	9.19580462		0	0	0	0.1065870	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1426	44.8621874		0	0	0	0.1230092	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.005058	1.59125487		0	0	0	0.0040300	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.1027	32.3095838		0	0	0	0.5266431	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.165	51.9092632		0	0	0	0.7688863	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.7847	246.867872		0	0	0	0.041647	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.878864	276.492016		0	0	0	0.0466446	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		12.3426036		0	0	0	0.0020822	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.003926	1.23512586		0	0	0	0.0108097	1	5	0%	0	0	0%	
Cadmium	B	mg/kg-dr	0.000772	0.24287243		0	0	0	0.0216760	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000386	0.01214362		0	0	0	0.0010838	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg-dr	0.5417	170.419684		0	0	0	0.0160887	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.639206	201.095227		0	0	0	0.0189847	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0003927	0.12354405		0	0	0	0.005257	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.00272	0.85571634		0	0	0	0.0185992	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0028375	0.89268203		0	0	0	0.0070219	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00007415	0.02332771		0	0	0	0.0059586	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000074	0.00232805		0	0	0	0.0016869	0.05	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g-dry	0.00318607	1.00234270		0	0	0	0.011618	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.238142	74.9198530		0	0	0	0.2054254	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00342427	1.07727955		0	0	0	0.0027283	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685694	B18020068-003	6010.20-S	SAMP		2/6/2018 6:24:00	5	118169	2/5/2018 7:5	0	0	14.9

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000091	0		0	0	0	0.0319178	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.01123	3.21064518		0	0	0	0.0955474	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.01792	5.12330914		0	0	0	0.3380469	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.01207	3.4508003		0	0	0	0.0109328	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.01801	5.14904005		0	0	0	0.1910377	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.02149	6.14396838		0	0	0	0.1276253	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.002019	0.57722998		0	0	0	0.0267944	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.02015	5.76086379		0	0	0	0.0495863	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685694	B18020068-003	6010.20-S	SAMP		2/6/2018 6:24:00	5	118169	2/5/2018 7:5	0	0	14.9

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/kg-dr	0.000767	0.21928449		0	0	0	0.1082985	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000169	0.04831692		0	0	0	0.0306598	1	1	0%	0	0	0%	J
Thallium	A	mg/kg-dr	0.0002	0.05717979		0	0	0	0.0136031	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.01452	4.15125272		0	0	0	0.0968626	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.01452	4.15125272		0	0	0	0.0968626	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1788	51.1187318		0	0	0	0.1117865	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.003504	1.00178991		0	0	0	0.0036624	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.03888	11.1157511		0	0	0	0.4785948	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.07939	22.6975174		0	0	0	0.6987370	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.3744	107.040566		0	0	0	0.0378473	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.419328	119.885434		0	0	0	0.042389	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		5.35168577		0	0	0	0.0018922	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.001216	0.34765312		0	0	0	0.0098235	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000329	0.09406075		0	0	0	0.0196984	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.00001645	0.00470304		0	0	0	0.0009849	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg-dr	0.2159	61.7255828		0	0	0	0.0146209	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.254762	72.8361877		0	0	0	0.0172526	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0005615	0.16053226		0	0	0	0.0047774	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.000896	0.25616546		0	0	0	0.0169023	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0010745	0.30719842		0	0	0	0.0063813	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00003835	0.01096422		0	0	0	0.0054149	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.00000845	0.00241585		0	0	0	0.001533	0.05	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g-dry	0.00158268	0.45248655		0	0	0	0.0105580	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.298596	85.3682821		0	0	0	0.1866834	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00237221	0.67821177		0	0	0	0.0024794	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685695	CCV	ICPMS-6020-W-	CCV		2/6/2018 6:27:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.1069	0.1069		0.05	0	0	0.0002849	0.1	4.5	214%	90	110	0%	S
Antimony	A	mg/L	0.05177	0.05177		0.05	0	0	3.047E-05	0.05	18	104%	90	110	0%	
Arsenic	A	mg/L	0.05119	0.05119		0.05	0	0	6.629E-05	0.005	18	102%	90	110	0%	
Barium	A	mg/L	0.05352	0.05352		0.05	0	0	6.437E-05	0.1	18	107%	90	110	0%	
Beryllium	A	mg/L	0.05019	0.05019		0.05	0	0	8.97E-06	0.001	4.5	100%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685695	CCV	ICPMS-6020-W-	CCV		2/6/2018 6:27:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	A	mg/L	0.04902	0.04902		0.05	0	0	0.00141	0.1	4.5	98%	90	110	0%	
Cadmium	A	mg/L	0.05064	0.05064		0.05	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.05168	0.05168		0.05	0	0	2.257E-05	0.001	4.5	103%	90	110	0%	
Chromium	A	mg/L	0.05329	0.05329		0.05	0	0	5.576E-05	0.01	18	107%	90	110	0%	
Cobalt	A	mg/L	0.0526	0.0526		0.05	0	0	3.904E-05	0.01	18	105%	90	110	0%	
Copper	A	mg/L	0.05078	0.05078		0.05	0	0	7.681E-05	0.01	4.5	102%	90	110	0%	
Iron	A	mg/L	1.487	1.487		1.3	0	0	0.000175	0.02	4.5	114%	90	110	0%	S
Lanthanum	A	mg/L	0.05259	0.05259		0.05	0	0	0.0000111	0.001	4.5	105%	90	110	0%	
Lead	A	mg/L	0.05052	0.05052		0.05	0	0	2.956E-05	0.01	18	101%	90	110	0%	
Manganese	A	mg/L	0.05516	0.05516		0.05	0	0	3.649E-05	0.01	18	110%	90	110	0%	
Mercury	A	mg/L	0.001048	0.001048		0.001	0	0	1.289E-05	0.001	0.36	105%	90	110	0%	
Molybdenum	A	mg/L	0.05128	0.05128		0.05	0	0	2.302E-05	0.005	9	103%	90	110	0%	
Nickel	A	mg/L	0.0532	0.0532		0.05	0	0	7.128E-05	0.01	4.5	106%	90	110	0%	
Selenium	A	mg/L	0.05153	0.05153		0.05	0	0	0.0001532	0.005	18	103%	90	110	0%	
Silver	A	mg/L	0.01964	0.01964		0.02	0	0	2.959E-05	0.005	1.8	98%	90	110	0%	
Strontium	A	mg/L	0.05088	0.05088		0.05	0	0	1.229E-05	0.1	18	102%	90	110	0%	
Thallium	A	mg/L	0.04934	0.04934		0.05	0	0	1.434E-05	0.1	18	99%	90	110	0%	
Thorium	A	mg/L	0.04808	0.04808		0.05	0	0	5.767E-05	0.001	4.5	96%	90	110	0%	
Thorium 232	A	mg/L	0.04808	0.04808		0.05	0	0	5.767E-05	0.01	4.5	96%	90	110	0%	
Tin	A	mg/L	0.05232	0.05232		0.05	0	0	5.199E-05	0.1	9	105%	90	110	0%	
Titanium	A	mg/L	0.0509	0.0509		0.05	0	0	0.0001736	0.01	18	102%	90	110	0%	
Uranium	A	mg/L	0.05203	0.05203		0.05	0	0	1.332E-05	0.001	4.5	104%	90	110	0%	
Vanadium	A	mg/L	0.0527	0.0527		0.05	0	0	7.351E-05	0.1	18	105%	90	110	0%	
Zinc	A	mg/L	0.04973	0.04973		0.05	0	0	0.0002495	0.01	4.5	99%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685696	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 6:30:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000066	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000044	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000456	0.000456		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000056	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001223	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000007	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685696	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 6:30:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cerium	A	mg/L	0.000163	0.000163		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.00038	0.00038		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.00006	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000049	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000083	0.000083		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.0006	0.0006		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.001208	0.001208		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000005	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000082	0.000082		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000027	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000263	0.000263		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000161	0.000161		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000262	0.000262		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	-0.000004	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000117	0.000117		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000117	0.000117		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000165	0.000165		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000456	0.000456		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	-0.000022	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000165	0.000165		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000048	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685697	CCB	ICPMS-6020-W-	CCB		2/6/2018 6:32:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.02455	0.02455		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000111	-0.000111		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000068	-0.000068		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.00025	0.00025		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000128	-0.000128		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.00132	-0.00132		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000076	-0.000076		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000078	0.000078		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000141	0.000141		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685697	CCB	ICPMS-6020-W-	CCB		2/6/2018 6:32:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cobalt	A	mg/L	-0.000146	-0.000146		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000113	-0.000113		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.05368	0.05368		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000045	0.000045		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000514	0.000514		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000775	0.000775		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000004	0.000004		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000122	-0.000122		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000048	-0.000048		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000188	-0.000188		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000007	-0.000007		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000094	0.000094		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000071	-0.000071		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000126	-0.000126		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000126	-0.000126		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000208	-0.000208		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000222	0.000222		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000104	-0.000104		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000034	-0.000034		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000068	-0.000068		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685698	B18020068-004	6010.20-S	SAMP		2/6/2018 6:35:00	5	118169	2/5/2018 7:5	0	0	10.1

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000364	0.09962425		0	0	0	0.0305551	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.02386	6.53031468		0	0	0	0.0914682	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.01113	3.04620295		0	0	0	0.2320917	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.04972	13.6080153		0	0	0	0.3236146	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.03193	8.73901709		0	0	0	0.0104660	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.05806	15.8906149		0	0	0	0.1828817	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.05546	15.1790131		0	0	0	0.1221765	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.002159	0.59090316		0	0	0	0.0256505	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.05224	14.2977217		0	0	0	0.0474693	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.001085	0.29695689		0	0	0	0.1036749	1	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685698	B18020068-004	6010.20-S	SAMP		2/6/2018 6:35:00	5	118169	2/5/2018 7:5	0	0	10.1

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/kg-dr	0.000554	0.15162592		0	0	0	0.0293508	1	1	0%	0	0	0%	J
Thallium	A	mg/kg-dr	0.000774	0.21183837		0	0	0	0.0130223	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.03785	10.3592796		0	0	0	0.0927272	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.03785	10.3592796		0	0	0	0.0927272	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1996	54.6291203		0	0	0	0.107014	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.00523	1.43141432		0	0	0	0.0035060	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.09658	26.4332687		0	0	0	0.4581621	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.2062	56.4354940		0	0	0	0.6689057	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.7626	208.718272		0	0	0	0.0362315	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.854112	233.764465		0	0	0	0.0405793	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		10.4352457		0	0	0	0.0018115	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.003516	0.96230454		0	0	0	0.0094041	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000957	0.26192419		0	0	0	0.0188574	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.00004785	0.01309621		0	0	0	0.0009429	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	1.425	390.012507		0	0	0	0.1310989	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	1.80975	495.315884		0	0	0	0.1664957	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.377	103.182256		0	0	0	0.0139967	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.44486	121.755062		0	0	0	0.0165161	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.001193	0.32651573		0	0	0	0.0045734	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.002486	0.68040077		0	0	0	0.0161807	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.002773	0.75895065		0	0	0	0.0061088	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00005425	0.01484784		0	0	0	0.0051837	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000277	0.0075813		0	0	0	0.0014675	0.05	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g-dry	0.00412565	1.12916147		0	0	0	0.0101073	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.333332	91.2306309		0	0	0	0.1787133	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00354071	0.9690675		0	0	0	0.0023736	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685699	B18020068-005	6010.20-S	SAMP		2/6/2018 6:38:00	5	118169	2/5/2018 7:5	0	0	1.42

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000125	0.03151628		0	0	0	0.0281478	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.01476	3.72144241		0	0	0	0.0842619	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.004627	1.16660664		0	0	0	0.2138064	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.01356	3.41888612		0	0	0	0.2981188	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685699	B18020068-005	6010.20-S	SAMP		2/6/2018 6:38:00	5	118169	2/5/2018 7:5	0	0	1.42

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cobalt	A	mg/kg-dr	0.01171	2.95244517		0	0	0	0.0096415	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.01168	2.94488126		0	0	0	0.1684734	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.01609	4.05677564		0	0	0	0.1125509	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.002601	0.65579077		0	0	0	0.0236296	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.01545	3.89541228		0	0	0	0.0437295	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000638	0.1608591		0	0	0	0.0955069	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000076	0		0	0	0	0.0270384	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	0.000068	0.01714486		0	0	0	0.0119964	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.01196	3.01547773		0	0	0	0.0854217	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.01196	3.01547773		0	0	0	0.0854217	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.3016	76.0424818		0	0	0	0.0985829	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.002232	0.56275471		0	0	0	0.0032298	1	5	0%	0	0	0%	J
Vanadium	A	mg/kg-dr	0.04883	12.3115199		0	0	0	0.4220660	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.0717	18.0777386		0	0	0	0.6162063	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.6497	163.809020		0	0	0	0.0333770	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.727664	183.466102		0	0	0	0.0373822	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		8.18992682		0	0	0	0.0016687	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.001083	0.27305706		0	0	0	0.0086632	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000394	0.09933932		0	0	0	0.0173718	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000197	0.00496697		0	0	0	0.0008686	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	1.153	290.706172		0	0	0	0.1207704	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	1.46431	369.196839		0	0	0	0.1533784	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.1292	32.5752276		0	0	0	0.0128939	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.152456	38.4387686		0	0	0	0.0152149	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.000738	0.18607212		0	0	0	0.0042131	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.000678	0.17094431		0	0	0	0.0149059	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0008045	0.20283878		0	0	0	0.0056275	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0000319	0.00804295		0	0	0	0.0047753	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000038	0		0	0	0	0.0013519	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00130364	0.32868707		0	0	0	0.009311	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.503672	126.990945		0	0	0	0.1646335	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00151106	0.38098494		0	0	0	0.0021866	0.677	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685700	B18020068-006	6010.20-S	SAMP		2/6/2018 6:40:00	5	118169	2/5/2018 7:5	0	0	6.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000166	0.04394689		0	0	0	0.0295556	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.01029	2.72417787		0	0	0	0.0884762	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.01397	3.69842224		0	0	0	0.2244998	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.036	9.53065143		0	0	0	0.313029	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.01747	4.62501335		0	0	0	0.0101237	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.02284	6.04666885		0	0	0	0.1768995	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.02849	7.54245165		0	0	0	0.1181801	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.00194	0.51359622		0	0	0	0.0248115	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.03208	8.49286939		0	0	0	0.0459166	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000689	0.18240608		0	0	0	0.1002836	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000068	0		0	0	0	0.0283908	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	0.000283	0.07492151		0	0	0	0.0125963	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.01895	5.01682902		0	0	0	0.0896940	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.01895	5.01682902		0	0	0	0.0896940	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1817	48.1033157		0	0	0	0.1035135	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.004082	1.08066998		0	0	0	0.0033913	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.05548	14.6877928		0	0	0	0.4431753	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.1004	26.5799279		0	0	0	0.6470253	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.6209	164.377263		0	0	0	0.0350463	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.695408	184.102535		0	0	0	0.0392519	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		8.21833715		0	0	0	0.0017522	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.001825	0.48315108		0	0	0	0.0090965	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000439	0.116221		0	0	0	0.0182406	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.00002195	0.00581105		0	0	0	0.0009120	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	0.9054	239.695884		0	0	0	0.1268106	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	1.149858	304.413772		0	0	0	0.1610495	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.3731	98.7746125		0	0	0	0.0135388	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.440258	116.554043		0	0	0	0.0159758	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0005145	0.13620889		0	0	0	0.0044238	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0018	0.47653257		0	0	0	0.0156514	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0014245	0.37712258		0	0	0	0.0059090	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00003445	0.00912030		0	0	0	0.0050142	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000034	0		0	0	0	0.0014195	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00206555	0.54683436		0	0	0	0.0097766	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.303439	80.3325372		0	0	0	0.1728675	1.67	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685700	B18020068-006	6010.20-S	SAMP		2/6/2018 6:40:00	5	118169	2/5/2018 7:5	0	0	6.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium, Activity	C	pCi/g-dry	0.00276351	0.73161357		0	0	0	0.0022959	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685701	B18020068-007	6010.20-S	SAMP		2/6/2018 6:43:00	5	118169	2/5/2018 7:5	0	0	14.4

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.00008	0		0	0	0	0.030075	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.009578	2.58024163		0	0	0	0.090031	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.01095	2.94984818		0	0	0	0.2284449	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.02311	6.22566133		0	0	0	0.3185297	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.01117	3.00911454		0	0	0	0.0103016	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.01365	3.67720801		0	0	0	0.1800081	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.01763	4.74939027		0	0	0	0.1202568	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.001207	0.32515678		0	0	0	0.0252475	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.01984	5.34474776		0	0	0	0.0467234	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000617	0.16621519		0	0	0	0.1020459	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000009	0		0	0	0	0.0288897	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	0.000038	0		0	0	0	0.0128177	1	5	0%	0	0	0%	
Thorium	A	mg/kg-dr	0.01281	3.45091829		0	0	0	0.0912702	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.01281	3.45091829		0	0	0	0.0912702	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1594	42.941169		0	0	0	0.1053325	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.003338	0.89923226		0	0	0	0.0034509	1	5	0%	0	0	0%	J
Vanadium	A	mg/kg-dr	0.04762	12.8284722		0	0	0	0.4509631	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.06098	16.4275564		0	0	0	0.6583953	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.5048	135.989348		0	0	0	0.0356622	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.565376	152.308070		0	0	0	0.0399416	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		6.79903225		0	0	0	0.001783	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.001232	0.33189159		0	0	0	0.0092563	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000269	0.07246659		0	0	0	0.0185611	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.00001345	0.00362333		0	0	0	0.0009281	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	1.143	307.91566		0	0	0	0.1290390	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	1.45161	391.052888		0	0	0	0.1638796	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.3601	97.0082494		0	0	0	0.0137767	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.424918	114.469734		0	0	0	0.0162565	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0004789	0.12901208		0	0	0	0.0045015	0.05	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685701	B18020068-007	6010.20-S	SAMP		2/6/2018 6:43:00	5	118169	2/5/2018 7:5	0	0	14.4

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0011555	0.31128307		0	0	0	0.0159265	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0008815	0.23746951		0	0	0	0.0060128	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00003085	0.00831076		0	0	0	0.0051023	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.00000045	0		0	0	0	0.0014445	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00139629	0.37615009		0	0	0	0.0099485	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.266198	71.7117522		0	0	0	0.1759052	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00225983	0.60878024		0	0	0	0.0023363	0.677	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685702	B18020068-008	6010.20-S	SAMP		2/6/2018 6:46:00	5	118169	2/5/2018 7:5	0	0	0.84

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	-0.000028	0		0	0	0	0.0247576	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.003554	0.78814499		0	0	0	0.0741131	1	5	0%	0	0	0%	J
Boron	A	mg/kg-dr	0.002298	0.50961091		0	0	0	0.1880549	1	5	0%	0	0	0%	J
Chromium	A	mg/kg-dr	0.01282	2.84299909		0	0	0	0.2622123	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.004397	0.97509103		0	0	0	0.0084802	1	5	0%	0	0	0%	J
Copper	A	mg/kg-dr	0.006158	1.36561532		0	0	0	0.1481819	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.007374	1.63527888		0	0	0	0.0989949	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.000927	0.20557412		0	0	0	0.0207836	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.007713	1.71045647		0	0	0	0.0384625	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000292	0		0	0	0	0.0840037	1	5	0%	0	0	0%	
Silver	A	mg/kg-dr	-0.000017	0		0	0	0	0.0237818	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	-0.000046	0		0	0	0	0.0105515	1	5	0%	0	0	0%	
Thorium	A	mg/kg-dr	0.005847	1.29664709		0	0	0	0.0751332	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.005847	1.29664709		0	0	0	0.0751332	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1747	38.7419611		0	0	0	0.0867093	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.000871	0.1931554		0	0	0	0.0028408	1	5	0%	0	0	0%	J
Vanadium	A	mg/kg-dr	0.02428	5.38440077		0	0	0	0.3712309	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.02544	5.64164562		0	0	0	0.5419883	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.09684	21.4755095		0	0	0	0.029357	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.1084608	24.0525706		0	0	0	0.0328798	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		1.07370675		0	0	0	0.0014678	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.000323	0.07162938		0	0	0	0.0076198	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000046	0		0	0	0	0.0152795	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685702	B18020068-008	6010.20-S	SAMP		2/6/2018 6:46:00	5	118169	2/5/2018 7:5	0	0	0.84

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000023	0		0	0	0	0.000764	0.05	0	0%	0	0	0%	
Manganese	B	mg/kg-dr	0.1854	41.1148230		0	0	0	0.1062244	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	0.235458	52.2158252		0	0	0	0.134905	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.0238	5.27795463		0	0	0	0.0113409	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.028084	6.22798646		0	0	0	0.0133823	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0001777	0.03940725		0	0	0	0.0037057	0.05	0	0%	0	0	0%	J
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.000641	0.14214995		0	0	0	0.0131106	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0003687	0.08176394		0	0	0	0.0049497	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0000146	0		0	0	0	0.0042002	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L-dry	-8.5E-07	0		0	0	0	0.0011891	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00063732	0.14133453		0	0	0	0.0081895	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.291749	64.699075		0	0	0	0.1448045	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00058967	0.13076620		0	0	0	0.0019232	0.677	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685703	B18020068-009	6010.20-S	SAMP		2/6/2018 6:48:00	5	118169	2/5/2018 7:5	0	0	3.91

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000046	0		0	0	0	0.0289237	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.006841	1.77236655		0	0	0	0.0865845	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.00608	1.57520664		0	0	0	0.2196999	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.03923	10.1637099		0	0	0	0.3063362	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.008598	2.22757018		0	0	0	0.0099072	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.01139	2.95092164		0	0	0	0.1731173	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.01003	2.59857279		0	0	0	0.1156533	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.005114	1.32493532		0	0	0	0.024281	1	5	0%	0	0	0%	
Nickel	A	mg/kg-dr	0.01406	3.64266535		0	0	0	0.0449348	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000522	0.13523978		0	0	0	0.0981395	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	-0.000014	0		0	0	0	0.0277837	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	0.000002	0		0	0	0	0.0123270	1	5	0%	0	0	0%	
Thorium	A	mg/kg-dr	0.006609	1.71225998		0	0	0	0.0877763	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.006609	1.71225998		0	0	0	0.0877763	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.2662	68.9671064		0	0	0	0.1013003	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.001476	0.38240214		0	0	0	0.0033188	1	5	0%	0	0	0%	J
Vanadium	A	mg/kg-dr	0.03627	9.39683302		0	0	0	0.4337	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685703	B18020068-009	6010.20-S	SAMP		2/6/2018 6:48:00	5	118169	2/5/2018 7:5	0	0	3.91

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/kg-dr	0.04056	10.5082864		0	0	0	0.6331916	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.307	79.537572		0	0	0	0.0342970	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.34384	89.0820806		0	0	0	0.0384127	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		3.97662408		0	0	0	0.0017147	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.000544	0.14093954		0	0	0	0.008902	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000172	0.04456177		0	0	0	0.0178506	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000086	0.00222809		0	0	0	0.0008925	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	0.5472	141.768597		0	0	0	0.1240993	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	0.694944	180.046119		0	0	0	0.1576062	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.08662	22.441513		0	0	0	0.0132494	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.1022116	26.4809853		0	0	0	0.0156342	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.00034205	0.08861833		0	0	0	0.0043292	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0019615	0.5081855		0	0	0	0.0153168	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0005015	0.12992864		0	0	0	0.0057827	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0000261	0.00676199		0	0	0	0.004907	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	-0.0000007	0		0	0	0	0.0013892	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00072038	0.18663634		0	0	0	0.0095676	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.444554	115.175068		0	0	0	0.1691715	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00099925	0.25888625		0	0	0	0.0022468	0.677	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685704	B18020068-010	6010.20-S	SAMP		2/6/2018 6:51:00	5	118169	2/5/2018 7:5	0	0	19.52

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000425	0.12592104		0	0	0	0.0330772	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.0216	6.39975183		0	0	0	0.0990184	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.017	5.03684172		0	0	0	0.2512495	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.0576	17.0660049		0	0	0	0.3503272	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.02031	6.01754443		0	0	0	0.0113299	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.06853	20.3043978		0	0	0	0.1979775	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.06704	19.8629335		0	0	0	0.1322615	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.002172	0.64353060		0	0	0	0.0277678	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.04184	12.3965563		0	0	0	0.0513876	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.001237	0.36650431		0	0	0	0.1122327	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.00019	0.05629411		0	0	0	0.0317736	1	1	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685704	B18020068-010	6010.20-S	SAMP		2/6/2018 6:51:00	5	118169	2/5/2018 7:5	0	0	19.52

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/kg-dr	0.000593	0.17569689		0	0	0	0.0140972	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.03671	10.8766153		0	0	0	0.1003813	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.03671	10.8766153		0	0	0	0.1003813	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.2117	62.7234936		0	0	0	0.1158474	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.003908	1.15788103		0	0	0	0.0037954	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.1131	33.5098117		0	0	0	0.4959808	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.2449	72.5601492		0	0	0	0.7241201	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	1.043	309.025054		0	0	0	0.0392222	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	1.16816	346.108060		0	0	0	0.0439288	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		15.4502638		0	0	0	0.001961	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.00439	1.30069030		0	0	0	0.0101803	1	5	0%	0	0	0%	
Cadmium	B	mg/kg-dr	0.000676	0.20028853		0	0	0	0.0204140	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000338	0.01001443		0	0	0	0.0010207	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	0.6447	191.014815		0	0	0	0.1419204	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	0.818769	242.588815		0	0	0	0.1802389	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.5039	149.297914		0	0	0	0.0151520	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.594602	176.171539		0	0	0	0.0178794	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.00108	0.31998759		0	0	0	0.0049509	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.00288	0.85330024		0	0	0	0.0175164	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.003352	0.99314667		0	0	0	0.0066131	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00006185	0.01832522		0	0	0	0.0056116	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000095	0.00281471		0	0	0	0.0015887	0.05	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g-dry	0.00400139	1.18555106		0	0	0	0.0109416	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.353539	104.748234		0	0	0	0.1934651	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00264572	0.78388545		0	0	0	0.0025695	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685705	B18020068-011	6010.20-S	SAMP		2/6/2018 6:54:00	5	118169	2/5/2018 7:5	0	0	13.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000064	0		0	0	0	0.0308092	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.006997	1.93095628		0	0	0	0.0922289	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.008048	2.22099988		0	0	0	0.2340219	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.01484	4.09538248		0	0	0	0.3263059	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.01173	3.23711836		0	0	0	0.0105531	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685705	B18020068-011	6010.20-S	SAMP		2/6/2018 6:54:00	5	118169	2/5/2018 7:5	0	0	13.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	A	mg/kg-dr	0.01198	3.30611065		0	0	0	0.1844026	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.01789	4.93708844		0	0	0	0.1231926	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.000468	0.12915357		0	0	0	0.0258638	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.01586	4.37687103		0	0	0	0.0478641	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.001025	0.2828684		0	0	0	0.1045371	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000008	0		0	0	0	0.0295949	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	0.000055	0.01517830		0	0	0	0.0131306	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.01167	3.22056021		0	0	0	0.0934984	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.01167	3.22056021		0	0	0	0.0934984	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1054	29.0871505		0	0	0	0.1079039	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.002409	0.66480973		0	0	0	0.0035352	1	5	0%	0	0	0%	J
Vanadium	A	mg/kg-dr	0.03945	10.8869837		0	0	0	0.4619724	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.0605	16.6961348		0	0	0	0.6744687	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.3485	96.1752556		0	0	0	0.0365328	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.39032	107.716286		0	0	0	0.0409167	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		4.80845502		0	0	0	0.0018265	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.001204	0.33226688		0	0	0	0.0094823	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000202	0.05574577		0	0	0	0.0190143	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000101	0.00278729		0	0	0	0.0009507	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	0.4566	126.007523		0	0	0	0.1321892	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	0.579882	160.029554		0	0	0	0.1678803	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.1419	39.1600252		0	0	0	0.0141131	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.167442	46.2088297		0	0	0	0.0166534	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.00034985	0.09654781		0	0	0	0.0046114	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.000742	0.20476912		0	0	0	0.0163153	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0008945	0.24685442		0	0	0	0.0061596	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00005125	0.01414342		0	0	0	0.0052269	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000004	0		0	0	0	0.0014797	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00127203	0.35104106		0	0	0	0.0101913	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.176018	48.5755413		0	0	0	0.1801996	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00163089	0.45007619		0	0	0	0.0023933	0.677	3	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685706	B18020068-012	6010.20-S	SAMP		2/6/2018 6:56:00	5	118169	2/5/2018 7:5	0	0	19.92

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000076	0		0	0	0	0.0328242	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.009196	2.70379389		0	0	0	0.098261	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.01028	3.02250992		0	0	0	0.2493277	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.02686	7.89733623		0	0	0	0.3476474	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.0248	7.29165817		0	0	0	0.0112433	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.02432	7.15052931		0	0	0	0.1964631	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.02826	8.3089621		0	0	0	0.1312498	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.001109	0.32606649		0	0	0	0.0275554	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.02911	8.55887780		0	0	0	0.0509946	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000899	0.26432261		0	0	0	0.1113742	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.00007	0		0	0	0	0.0315305	1	1	0%	0	0	0%	
Thallium	A	mg/kg-dr	0.000249	0.07321060		0	0	0	0.0139894	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.01889	5.55400899		0	0	0	0.0996135	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.01889	5.55400899		0	0	0	0.0996135	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.2557	75.1805240		0	0	0	0.1149612	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.00927	2.72555126		0	0	0	0.0037664	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.05109	15.0214039		0	0	0	0.4921869	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.1119	32.9006673		0	0	0	0.7185812	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.7195	211.546293		0	0	0	0.0389222	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.80584	236.931848		0	0	0	0.0435928	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		10.5766377		0	0	0	0.001946	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.002053	0.60361993		0	0	0	0.0101025	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.00061	0.17935127		0	0	0	0.0202579	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000305	0.00896756		0	0	0	0.0010129	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	0.4604	135.366106		0	0	0	0.1408348	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	0.584708	171.914954		0	0	0	0.1788603	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.1821	53.5407643		0	0	0	0.0150361	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.214878	63.1781018		0	0	0	0.0177426	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0004598	0.13518969		0	0	0	0.0049130	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.001343	0.39486681		0	0	0	0.0173824	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.001413	0.41544810		0	0	0	0.0065625	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00004495	0.01321613		0	0	0	0.0055687	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000035	0		0	0	0	0.0015765	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00205901	0.60538698		0	0	0	0.0108579	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.427019	125.551475		0	0	0	0.1919852	1.67	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685706	B18020068-012	6010.20-S	SAMP		2/6/2018 6:56:00	5	118169	2/5/2018 7:5	0	0	19.92

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium, Activity	C	pCi/g-dry	0.00627579	1.84519820		0	0	0	0.0025498	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685707	B18020068-013	6010.20-S	SAMP		2/6/2018 6:59:00	5	118169	2/5/2018 7:5	0	0	21.19

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000224	0.07027535		0	0	0	0.0350247	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.02254	7.07145689		0	0	0	0.1048483	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.01379	4.32632611		0	0	0	0.2660424	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.05869	18.4127686		0	0	0	0.3709534	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.03212	10.0769829		0	0	0	0.0119970	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.05309	16.6558849		0	0	0	0.2096339	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.06148	19.2880732		0	0	0	0.1400487	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.008543	2.68018883		0	0	0	0.0294027	1	5	0%	0	0	0%	
Nickel	A	mg/kg-dr	0.05527	17.3398146		0	0	0	0.0544132	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.001322	0.41475004		0	0	0	0.1188406	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000182	0.05709872		0	0	0	0.0336443	1	1	0%	0	0	0%	J
Thallium	A	mg/kg-dr	0.000792	0.24847355		0	0	0	0.0149272	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.03907	12.2574011		0	0	0	0.1062915	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.03907	12.2574011		0	0	0	0.1062915	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1199	37.6161349		0	0	0	0.1226681	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.03056	9.58756533		0	0	0	0.0040189	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.1089	34.1651134		0	0	0	0.5251827	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.2267	71.1224169		0	0	0	0.7667542	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.9198	288.568148		0	0	0	0.0415315	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	1.030176	323.196325		0	0	0	0.0465153	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		14.427484		0	0	0	0.0020764	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.004378	1.37350658		0	0	0	0.0107797	1	5	0%	0	0	0%	
Cadmium	B	mg/kg-dr	0.000947	0.29710158		0	0	0	0.0216159	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.00004735	0.01485508		0	0	0	0.0010808	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	1.427	447.691614		0	0	0	0.1502763	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	1.81229	568.56835		0	0	0	0.1908509	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.4568	143.311513		0	0	0	0.0160441	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.539024	169.107585		0	0	0	0.0189321	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.001127	0.35357284		0	0	0	0.0052424	0.05	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685707	B18020068-013	6010.20-S	SAMP		2/6/2018 6:59:00	5	118169	2/5/2018 7:5	0	0	21.19

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0029345	0.92063843		0	0	0	0.0185477	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.003074	0.96440366		0	0	0	0.0070024	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0000661	0.02073750		0	0	0	0.0059420	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000091	0.00285494		0	0	0	0.0016822	0.05	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g-dry	0.00425863	1.33605672		0	0	0	0.0115858	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.200233	62.8189453		0	0	0	0.2048558	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.02068912	6.49078173		0	0	0	0.0027208	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685708	CCV	ICPMS-6020-W-	CCV		2/6/2018 7:02:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.1535	0.1535		0.05	0	0	0.0002849	0.1	4.5	307%	90	110	0%	S
Antimony	A	mg/L	0.05178	0.05178		0.05	0	0	3.047E-05	0.05	18	104%	90	110	0%	
Arsenic	A	mg/L	0.05039	0.05039		0.05	0	0	6.629E-05	0.005	18	101%	90	110	0%	
Barium	A	mg/L	0.05342	0.05342		0.05	0	0	6.437E-05	0.1	18	107%	90	110	0%	
Beryllium	A	mg/L	0.05071	0.05071		0.05	0	0	8.97E-06	0.001	4.5	101%	90	110	0%	
Boron	A	mg/L	0.04927	0.04927		0.05	0	0	0.00141	0.1	4.5	99%	90	110	0%	
Cadmium	A	mg/L	0.05034	0.05034		0.05	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.05151	0.05151		0.05	0	0	2.257E-05	0.001	4.5	103%	90	110	0%	
Chromium	A	mg/L	0.05108	0.05108		0.05	0	0	5.576E-05	0.01	18	102%	90	110	0%	
Cobalt	A	mg/L	0.05054	0.05054		0.05	0	0	3.904E-05	0.01	18	101%	90	110	0%	
Copper	A	mg/L	0.04977	0.04977		0.05	0	0	7.681E-05	0.01	4.5	100%	90	110	0%	
Iron	A	mg/L	1.418	1.418		1.3	0	0	0.000175	0.02	4.5	109%	90	110	0%	
Lanthanum	A	mg/L	0.05209	0.05209		0.05	0	0	0.0000111	0.001	4.5	104%	90	110	0%	
Lead	A	mg/L	0.05098	0.05098		0.05	0	0	2.956E-05	0.01	18	102%	90	110	0%	
Manganese	A	mg/L	0.05323	0.05323		0.05	0	0	3.649E-05	0.01	18	106%	90	110	0%	
Mercury	A	mg/L	0.001027	0.001027		0.001	0	0	1.289E-05	0.001	0.36	103%	90	110	0%	
Molybdenum	A	mg/L	0.05023	0.05023		0.05	0	0	2.302E-05	0.005	9	100%	90	110	0%	
Nickel	A	mg/L	0.05125	0.05125		0.05	0	0	7.128E-05	0.01	4.5	102%	90	110	0%	
Selenium	A	mg/L	0.05088	0.05088		0.05	0	0	0.0001532	0.005	18	102%	90	110	0%	
Silver	A	mg/L	0.0195	0.0195		0.02	0	0	2.959E-05	0.005	1.8	98%	90	110	0%	
Strontium	A	mg/L	0.04994	0.04994		0.05	0	0	1.229E-05	0.1	18	100%	90	110	0%	
Thallium	A	mg/L	0.04952	0.04952		0.05	0	0	1.434E-05	0.1	18	99%	90	110	0%	
Thorium	A	mg/L	0.04974	0.04974		0.05	0	0	5.767E-05	0.001	4.5	99%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685708	CCV	ICPMS-6020-W-	CCV		2/6/2018 7:02:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thorium 232	A	mg/L	0.04974	0.04974		0.05	0	0	5.767E-05	0.01	4.5	99%	90	110	0%	
Tin	A	mg/L	0.05214	0.05214		0.05	0	0	5.199E-05	0.1	9	104%	90	110	0%	
Titanium	A	mg/L	0.04953	0.04953		0.05	0	0	0.0001736	0.01	18	99%	90	110	0%	
Uranium	A	mg/L	0.05198	0.05198		0.05	0	0	1.332E-05	0.001	4.5	104%	90	110	0%	
Vanadium	A	mg/L	0.05144	0.05144		0.05	0	0	7.351E-05	0.1	18	103%	90	110	0%	
Zinc	A	mg/L	0.04967	0.04967		0.05	0	0	0.0002495	0.01	4.5	99%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685709	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:04:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000075	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000054	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000693	0.000693		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000093	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001302	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000018	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000197	0.000197		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	-0.000173	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000075	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000039	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000105	0.000105		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000692	0.000692		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.001034	0.001034		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000004	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000077	0.000077		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000009	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.00014	0.00014		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.00028	0.00028		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	-0.000016	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000084	0.000084		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000084	0.000084		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000127	0.000127		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000447	0.000447		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685709	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:04:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	mg/L	-0.000029	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000032	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000112	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685710	CCB	ICPMS-6020-W-	CCB		2/6/2018 7:07:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.03481	0.03481		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000127	-0.000127		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000076	-0.000076		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000357	0.000357		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000152	-0.000152		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001494	-0.001494		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000085	-0.000085		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000115	0.000115		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000241	-0.000241		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000143	-0.000143		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.00011	-0.00011		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.05866	0.05866		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000051	0.000051		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000398	0.000398		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000685	0.000685		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000011	-0.000011		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000154	-0.000154		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000041	-0.000041		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000193	-0.000193		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000027	-0.000027		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000108	0.000108		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000048	-0.000048		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000149	-0.000149		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000149	-0.000149		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000213	-0.000213		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000133	0.000133		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000112	-0.000112		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685710	CCB	ICPMS-6020-W-	CCB		2/6/2018 7:07:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	-0.000072	-0.000072		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000043	-0.000043		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685711	B18020068-014	6010.20-S	SAMP		2/6/2018 7:10:00	5	118169	2/5/2018 7:5	0	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000044	0		0	0	0	0.0284081	1	5	0%	0	0	0%	
Arsenic	A	mg/kg-dr	0.008258	2.10134705		0	0	0	0.0850412	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.003166	0.80562664		0	0	0	0.2157838	1	5	0%	0	0	0%	J
Chromium	A	mg/kg-dr	0.006726	1.71151129		0	0	0	0.3008758	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.006902	1.75629660		0	0	0	0.0097306	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.006498	1.65349396		0	0	0	0.1700315	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.009758	2.48304002		0	0	0	0.1135918	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.003486	0.88705447		0	0	0	0.0238482	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.01045	2.65912771		0	0	0	0.0441339	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000363	0		0	0	0	0.0963902	1	5	0%	0	0	0%	
Thallium	A	mg/kg-dr	-0.000001	0		0	0	0	0.0121073	1	5	0%	0	0	0%	
Thorium	A	mg/kg-dr	0.007803	1.98556685		0	0	0	0.0862117	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.007803	1.98556685		0	0	0	0.0862117	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1303	33.1563963		0	0	0	0.0994946	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.005682	1.44585298		0	0	0	0.0032597	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.02864	7.28779117		0	0	0	0.4259694	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.03179	8.08934641		0	0	0	0.6219051	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.3261	82.9800524		0	0	0	0.0336857	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.365232	92.9376586		0	0	0	0.037728	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		4.14873708		0	0	0	0.0016842	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.000445	0.11323558		0	0	0	0.0087433	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000171	0.043513		0	0	0	0.0175324	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.00000855	0.00217565		0	0	0	0.0008766	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	0.657	167.181522		0	0	0	0.1218873	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	0.83439	212.320533		0	0	0	0.1547969	1.27	100000	0%	0	0	0%	
Silver	B	mg/kg-dr	0.000253	0.06437888		0	0	0	0.0272885	1	1	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	B	mg/L-dry	0.00001265	0.00321894		0	0	0	0.0013644	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg-dr	0.12	30.5354378		0	0	0	0.0130132	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685711	B18020068-014	6010.20-S	SAMP		2/6/2018 7:10:00	5	118169	2/5/2018 7:5	0	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium as SrO	B	mg/kg-dr	0.1416	36.0318167		0	0	0	0.0153556	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0004129	0.10506735		0	0	0	0.0042521	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0003363	0.08557556		0	0	0	0.0150438	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0004879	0.12415200		0	0	0	0.0056796	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00001815	0		0	0	0	0.0048195	0.05	0	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00085053	0.21642679		0	0	0	0.0093971	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.217601	55.3711818		0	0	0	0.1661560	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00384671	0.97884247		0	0	0	0.0022068	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685712	B18020068-014	6010.20-S	SD		2/6/2018 7:12:00	25	118169	2/5/2018 7:5	0	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	1.441	1833.39858		0	0	1926.7861	8.7331352	8.7331352	5	0%			5%	
Antimony	A	mg/kg-dr	-0.000094	0		0	0	0	0.1420407	1	5	0%				
Arsenic	A	mg/kg-dr	0.001354	1.72270762		0	0	2.1013470	0.425206	1	5	0%				N
Barium	A	mg/kg-dr	0.06144	78.1707209		0	0	82.980052	0.1684284	1	5	0%			6%	
Beryllium	A	mg/kg-dr	-0.000036	0		0	0	0.1132356	0.0437166	1	5	0%				
Boron	A	mg/kg-dr	-0.000671	0		0	0	0.8056266	1.0789188	1.0789188	5	0%				
Cadmium	A	mg/kg-dr	-0.000042	0		0	0	0.043513	0.0876622	1	5	0%				
Chromium	A	mg/kg-dr	0.00159	2.02297276		0	0	1.7115113	1.5043792	1.5043792	5	0%				N
Cobalt	A	mg/kg-dr	0.001145	1.45679485		0	0	1.7562966	0.0486531	1	5	0%			19%	R
Copper	A	mg/kg-dr	0.001364	1.73543072		0	0	1.653494	0.8501575	1	5	0%				N
Lead	A	mg/kg-dr	0.001802	2.29270246		0	0	2.4830400	0.5679591	1	5	0%				N
Manganese	A	mg/kg-dr	0.1313	167.054291		0	0	167.18152	0.6094364	1	5	0%			0%	
Molybdenum	A	mg/kg-dr	0.000511	0.65015036		0	0	0.8870545	0.1192409	1	5	0%				N
Nickel	A	mg/kg-dr	0.001951	2.48227664		0	0	2.6591277	0.2206694	1	5	0%			7%	
Selenium	A	mg/kg-dr	0.000056	0		0	0	0	0.481951	1	5	0%				
Silver	A	mg/kg-dr	0.000029	0		0	0	0.0643789	0.1364425	1	1	0%				
Strontium	A	mg/kg-dr	0.02279	28.9959429		0	0	30.535438	0.0650659	1	5	0%			5%	
Thallium	A	mg/kg-dr	-0.000128	0		0	0	0	0.0605365	1	5	0%				
Thorium	A	mg/kg-dr	0.001519	1.93263875		0	0	1.9855668	0.4310586	1	5	0%				N
Thorium 232	A	mg/kg-dr	0.001519	1.93263875		0	0	1.9855668	0.4310586	1	5	0%				N
Tin	A	mg/kg-dr	0.000744	0		0	0	1.1799402	1.0901151	1.0901151	5	0%				
Titanium	A	mg/kg-dr	0.02569	32.6856416		0	0	33.156396	0.4974732	1	5	0%			1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685712	B18020068-014	6010.20-S	SD		2/6/2018 7:12:00	25	118169	2/5/2018 7:5	0	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	mg/kg-dr	0.000981	1.24813602		0	0	1.445853	0.0162983	1	5	0%			15%	R
Vanadium	A	mg/kg-dr	0.005204	6.62110077		0	0	7.2877912	2.1298468	2.1298468	5	0%				N
Zinc	A	mg/kg-dr	0.007274	9.25478229		0	0	8.0893464	3.1095254	3.1095254	5	0%				N
Aluminum as Al2O3	C	mg/kg-dr	2.72349	3465.12332		0	0	0	16.505626	16.505626	100000	0%				N
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0000677	0.08613538		0	0	0.1050674	0.0212603	0.05	0	0%				N
Barium as BaO	C	mg/kg-dr	0.0688128	87.5512074		0	0	92.937659	0.1886398	1.12	100000	0%			6%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		3.9082859		0	0	4.1487371	0.0084209	0.0499968	0	0%			6%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	-0.0000021	0		0	0	0.0021756	0.0043831	0.05	0	0%				
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0000795	0.10114864		0	0	0.0855756	0.075219	0.075219	0	0%				N
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0000901	0.11463512		0	0	0.1241520	0.028398	0.05	0	0%				N
Manganese as MnO	C	mg/kg-dr	0.166751	212.15895		0	0	212.32053	0.7739843	1.27	100000	0%			0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0000028	0		0	0	0	0.0240975	0.05	0	0%				
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.00000145	0		0	0	0.0032189	0.0068221	0.05	0	0%				
Strontium as SrO	C	mg/kg-dr	0.0268922	34.2152126		0	0	36.031817	0.0767778	1.18	100000	0%			5%	
Thorium 232, Activity	C	pCi/g-dry	0.00016557	0.21065762		0	0	0.2164268	0.0469854	0.109	100000	0%				N
Titanium as TiO2	C	mg/kg-dr	0.0429023	54.5850215		0	0	55.371182	0.8307802	1.67	100000	0%			1%	
Uranium, Activity	C	pCi/g-dry	0.00066414	0.84498809		0	0	0.9788425	0.0110339	0.677	3	0%			15%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685713	B18020068-014	6010.20-S	PDS1		2/6/2018 7:15:00	5.1	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	7.087	1839.43951		12.978876	1926.7861	0	1.7815596	5	5		75	125	0%	A
Antimony	A	mg/kg-dr	0.05155	13.3798655		12.978876	0	0	0.0289763	1	5	103%	75	125	0%	
Arsenic	A	mg/kg-dr	0.05806	15.0695439		12.978876	2.1013470	0	0.0867420	1	5	100%	75	125	0%	
Barium	A	mg/kg-dr	0.3772	97.9027208		12.978876	82.980052	0	0.0343594	1	5		75	125	0%	A
Beryllium	A	mg/kg-dr	0.05013	13.0113027		12.978876	0.1132356	0	0.0089182	1	5	99%	75	125	0%	
Boron	A	mg/kg-dr	0.0535	13.8859904		12.978876	0.8056266	0	0.2200994	1	5	101%	75	125	0%	
Cadmium	A	mg/kg-dr	0.04973	12.9074823		12.978876	0.043513	0	0.0178831	1	5	99%	75	125	0%	
Chromium	A	mg/kg-dr	0.0585	15.1837465		12.978876	1.7115113	0	0.3068934	1	5	104%	75	125	0%	
Cobalt	A	mg/kg-dr	0.05746	14.9138132		12.978876	1.7562966	0	0.0099252	1	5	101%	75	125	0%	
Copper	A	mg/kg-dr	0.0559	14.5089133		12.978876	1.653494	0	0.1734321	1	5	99%	75	125	0%	
Lead	A	mg/kg-dr	0.06089	15.8040739		12.978876	2.4830400	0	0.1158637	1	5	103%	75	125	0%	
Manganese	A	mg/kg-dr	0.6858	178.000228		12.978876	167.18152	0	0.1243250	1	5		75	125	0%	A
Molybdenum	A	mg/kg-dr	0.05627	14.6049472		12.978876	0.8870545	0	0.0243251	1	5	106%	75	125	0%	

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Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685713	B18020068-014	6010.20-S	PDS1		2/6/2018 7:15:00	5.1	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/kg-dr	0.0607	15.7547592		12.978876	2.6591277	0	0.0450166	1	5	101%	75	125	0%	
Selenium	A	mg/kg-dr	0.04888	12.6868637		12.978876	0	0	0.0983180	1	5	98%	75	125	0%	
Silver	A	mg/kg-dr	0.02091	5.42721605		5.1915506	0.0643789	0	0.0278343	1	1	103%	75	125	0%	
Strontium	A	mg/kg-dr	0.1657	43.0076374		12.978876	30.535438	0	0.0132734	1	5	96%	75	125	0%	
Thallium	A	mg/kg-dr	0.04964	12.8841226		12.978876	0	0	0.0123494	1	5	99%	75	125	0%	
Thorium	A	mg/kg-dr	0.06035	15.6639162		12.978876	1.9855668	0	0.087936	1	5	105%	75	125	0%	
Thorium 232	A	mg/kg-dr	0.06035	15.6639162		12.978876	1.9855668	0	0.087936	1	5	105%	75	125	0%	
Tin	A	mg/kg-dr	0.05833	15.1396228		12.978876	1.1799402	0	0.2223835	1	5	108%	75	125	0%	
Titanium	A	mg/kg-dr	0.1828	47.4459633		12.978876	33.156396	0	0.1014845	1	5	110%	75	125	0%	
Uranium	A	mg/kg-dr	0.05866	15.2252747		12.978876	1.445853	0	0.0033249	1	5	106%	75	125	0%	
Vanadium	A	mg/kg-dr	0.08027	20.8341766		12.978876	7.2877912	0	0.4344887	1	5	104%	75	125	0%	
Zinc	A	mg/kg-dr	0.07859	20.3981305		12.978876	8.0893464	0	0.6343432	1	5	95%	75	125	0%	
Aluminum as Al2O3	C	mg/kg-dr	13.39443	3476.54067		0	0	0	3.3671476	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.002903	0.7534772		0	0.1050674	0	0.0043371	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg-dr	0.422464	109.651047		0	92.937659	0	0.0384825	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		4.89482275		0	4.1487371	0	0.0017179	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.0024865	0.64537411		0	0.0021756	0	0.0008942	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.002925	0.75918732		0	0.0855756	0	0.0153447	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0030445	0.79020369		0	0.1241520	0	0.0057932	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg-dr	0.870966	226.060289		0	212.32053	0	0.1578928	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.002444	0.63434319		0	0	0	0.0049159	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0010455	0.27136080		0	0.0032189	0	0.0013917	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg-dr	0.195526	50.7490122		0	36.031817	0	0.0156627	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.00657815	1.70736687		0	0.2164268	0	0.0095850	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.305276	79.2347588		0	55.371182	0	0.1694792	1.67	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g-dry	0.03971282	10.3075109		0	0.9788425	0	0.0022509	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685714	SRM-118169	6010.20-S	SRM		2/6/2018 7:18:00	5	118169	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	35.22	8738.082		8780	0	0	1.7029584	5	5	100%	11	189	0%	
Antimony	A	mg/kg	0.0812	20.14572		48	0	0	0.0276979	1	5	42%	0	238	0%	
Arsenic	A	mg/kg	0.5029	124.76949		123	0	0	0.0829150	1	5	101%	87	112	0%	
Barium	A	mg/kg	1.095	271.6695		253	0	0	0.0328435	1	5	107%	65	134	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685714	SRM-118169	6010.20-S	SRM		2/6/2018 7:18:00	5	118169	2/5/2018 7:5	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/kg	0.7599	188.53119		192	0	0	0.0085247	1	5	98%	82	118	0%	
Boron	A	mg/kg	0.6005	148.98405		139	0	0	0.2103888	1	5	107%	78	122	0%	
Cadmium	A	mg/kg	0.9441	234.23121		224	0	0	0.0170941	1	5	105%	87	112	0%	
Chromium	A	mg/kg	0.7501	186.09981		179	0	0	0.2933534	1	5	104%	86	114	0%	
Cobalt	A	mg/kg	0.2619	64.97739		60.1	0	0	0.0094873	1	5	108%	84	116	0%	
Copper	A	mg/kg	0.3139	77.87859		78.9	0	0	0.1657804	1	5	99%	84	116	0%	
Lead	A	mg/kg	0.6165	152.95365		145	0	0	0.1107518	1	5	105%	80	120	0%	
Manganese	A	mg/kg	1.662	412.3422		335	0	0	0.1188399	1	5	123%	62	138	0%	
Molybdenum	A	mg/kg	0.236	58.5516		57.8	0	0	0.0232519	1	5	101%	80	120	0%	
Nickel	A	mg/kg	0.6049	150.07569		143	0	0	0.0430305	1	5	105%	84	112	0%	
Selenium	A	mg/kg	0.1766	43.81446		42.4	0	0	0.0939803	1	5	103%	79	121	0%	
Silver	A	mg/kg	0.3659	90.77979		81.6	0	0	0.0266062	1	1	111%	83	117	0%	
Strontium	A	mg/kg	1.376	341.3856		359	0	0	0.0126878	1	5	95%	65	135	0%	
Thallium	A	mg/kg	0.2154	53.44074		52	0	0	0.0118046	1	5	103%	78	122	0%	
Thorium	A	mg/kg	0.01426	3.537906		0	0	0	0.0840563	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg	0.01426	3.537906		0	0	0	0.0840563	1	5	0%	0	0	0%	
Tin	A	mg/kg	0.5529	137.17449		123	0	0	0.2125721	1	5	112%	78	122	0%	
Titanium	A	mg/kg	0.4746	117.74826		119	0	0	0.0970071	1	5	99%	14	187	0%	
Uranium	A	mg/kg	0.005484	1.3605804		0	0	0	0.0031782	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	0.2977	73.85937		72.3	0	0	0.4153194	1	5	102%	81	119	0%	
Zinc	A	mg/kg	2.994	742.8114		770	0	0	0.6063564	1	5	96%	83	117	0%	
Aluminum as Al2O3	C	mg/kg	66.5658	16514.975		0	0	0	3.2185914	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	0.025145	6.2384745		0	0	0	0.0041458	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg	1.2264	304.26984		0	0	0	0.0367847	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		13.5826057		0	0	0	0.0016421	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	0.047205	11.7115605		0	0	0	0.0008547	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.037505	9.3049905		0	0	0	0.0146677	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.030825	7.6476825		0	0	0	0.0055376	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg	2.11074	523.674594		0	0	0	0.1509267	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	0.00883	2.190723		0	0	0	0.0046990	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.018295	4.5389895		0	0	0	0.0013303	0.05	0	0%	0	0	0%	
Strontium as SrO	C	mg/kg	1.62368	402.835008		0	0	0	0.0149716	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g	0.00155434	0.38563175		0	0	0	0.0091621	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg	0.792582	196.639594		0	0	0	0.1620019	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g	0.00371267	0.92111293		0	0	0	0.0021516	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685715	B18020068-014	6010.20-S	MS3		2/6/2018 7:20:00	5	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	15.53	3993.45145		257.11854	1926.7861	0	1.7650387	5	5		75	125	0%	A
Antimony	A	mg/kg-dr	0.1478	38.005932		51.423708	0	0	0.0287076	1	5	74%	75	125	0%	S
Arsenic	A	mg/kg-dr	0.2171	55.8260341		51.423708	2.1013470	0	0.0859376	1	5	104%	75	125	0%	
Barium	A	mg/kg-dr	0.5268	135.463633		51.423708	82.980052	0	0.0340408	1	5	102%	75	125	0%	
Beryllium	A	mg/kg-dr	0.1042	26.7944392		25.711854	0.1132356	0	0.0088355	1	5	104%	75	125	0%	
Boron	A	mg/kg-dr	0.2136	54.9260289		51.423708	0.8056266	0	0.2180584	1	5	105%	75	125	0%	
Cadmium	A	mg/kg-dr	0.1025	26.3572938		25.711854	0.043513	0	0.0177172	1	5	102%	75	125	0%	
Chromium	A	mg/kg-dr	0.2244	57.7031877		51.423708	1.7115113	0	0.3040475	1	5	109%	75	125	0%	
Cobalt	A	mg/kg-dr	0.2215	56.9574691		51.423708	1.7562966	0	0.0098332	1	5	107%	75	125	0%	
Copper	A	mg/kg-dr	0.2101	54.0260238		51.423708	1.653494	0	0.1718238	1	5	102%	75	125	0%	
Lead	A	mg/kg-dr	0.2225	57.2146135		51.423708	2.4830400	0	0.1147892	1	5	106%	75	125	0%	
Manganese	A	mg/kg-dr	1.856	477.259877		257.11854	167.18152	0	0.1231721	1	5	121%	75	125	0%	
Molybdenum	A	mg/kg-dr	0.211	54.2574537		51.423708	0.8870545	0	0.0240996	1	5	104%	75	125	0%	
Nickel	A	mg/kg-dr	0.224	57.60033		51.423708	2.6591277	0	0.0445991	1	5	107%	75	125	0%	
Selenium	A	mg/kg-dr	0.2004	51.5317238		51.423708	0	0	0.0974063	1	5	100%	75	125	0%	
Silver	A	mg/kg-dr	0.111	28.5430206		25.711854	0.0643789	0	0.0275762	1	1	111%	75	125	0%	
Strontium	A	mg/kg-dr	0.2948	75.8061485		51.423708	30.535438	0	0.0131504	1	5	88%	75	125	0%	
Thallium	A	mg/kg-dr	0.2	51.4288660		51.423708	0	0	0.0122349	1	5	100%	75	125	0%	
Thorium	A	mg/kg-dr	0.2243	57.6774733		51.423708	1.9855668	0	0.0871205	1	5	108%	75	125	0%	
Thorium 232	A	mg/kg-dr	0.2243	57.6774733		51.423708	1.9855668	0	0.0871205	1	5	108%	75	125	0%	
Tin	A	mg/kg-dr	0.2226	57.2403279		51.423708	1.1799402	0	0.2203213	1	5	109%	75	125	0%	
Titanium	A	mg/kg-dr	0.5381	138.369364		51.423708	33.156396	0	0.1005434	1	5	205%	75	125	0%	S
Uranium	A	mg/kg-dr	0.2208	56.7774681		51.423708	1.445853	0	0.0032940	1	5	108%	75	125	0%	
Vanadium	A	mg/kg-dr	0.2675	68.7861083		51.423708	7.2877912	0	0.4304596	1	5	120%	75	125	0%	
Zinc	A	mg/kg-dr	0.2389	61.4317805		51.423708	8.0893464	0	0.6284607	1	5	104%	75	125	0%	
Aluminum as Al2O3	C	mg/kg-dr	29.3517	7547.62324		0	0	0	3.3359231	9.45	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.010855	2.79130170		0	0.1050674	0	0.0042969	0.05	0	0%	0	0	0%	
Barium as BaO	C	mg/kg-dr	0.590016	151.719269		0	92.937659	0	0.0381257	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		6.77274817		0	4.1487371	0	0.0017019	0.0499968	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.005125	1.31786469		0	0.0021756	0	0.0008859	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.01122	2.88515938		0	0.0855756	0	0.0152024	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.011125	2.86073067		0	0.1241520	0	0.0057395	0.05	0	0%	0	0	0%	
Manganese as MnO	C	mg/kg-dr	2.35712	606.120043		0	212.32053	0	0.1564286	1.27	100000	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.01002	2.57658619		0	0	0	0.0048703	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.00555	1.42715103		0	0.0032189	0	0.0013788	0.05	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685715	B18020068-014	6010.20-S	MS3		2/6/2018 7:20:00	5	118169	2/5/2018 7:5	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium as SrO	C	mg/kg-dr	0.347864	89.4512553		0	36.031817	0	0.0155174	1.18	100000	0%	0	0	0%	
Thorium 232, Activity	C	pCi/g-dry	0.0244487	6.28684458		0	0.2164268	0	0.0094961	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.898627	231.076838		0	55.371182	0	0.1679075	1.67	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g-dry	0.1494816	38.4383459		0	0.9788425	0	0.0022301	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685716	B18020068-014	6010.20-S	MSD3		2/6/2018 7:23:00	5	118169	2/5/2018 7:5	1E+07	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg-dr	18.65	4792.85565		256.98958	1926.7861	3993.4514	1.7639765	5	5		75	125	18%	A
Antimony	A	mg/kg-dr	0.1335	34.3081088		51.397916	0	38.005932	0.0286903	1	5	67%	75	125	10%	S
Arsenic	A	mg/kg-dr	0.2112	54.2761991		51.397916	2.1013470	55.826034	0.0858859	1	5	102%	75	125	3%	
Barium	A	mg/kg-dr	0.6196	159.230743		51.397916	82.980052	135.46363	0.0340203	1	5	148%	75	125	16%	S
Beryllium	A	mg/kg-dr	0.1055	27.1124006		25.698958	0.1132356	26.794439	0.0088302	1	5	105%	75	125	1%	
Boron	A	mg/kg-dr	0.218	56.0237283		51.397916	0.8056266	54.926029	0.2179272	1	5	107%	75	125	2%	
Cadmium	A	mg/kg-dr	0.1023	26.290034		25.698958	0.043513	26.357294	0.0177066	1	5	102%	75	125	0%	
Chromium	A	mg/kg-dr	0.223	57.3086762		51.397916	1.7115113	57.703188	0.3038645	1	5	108%	75	125	1%	
Cobalt	A	mg/kg-dr	0.2198	56.4863095		51.397916	1.7562966	56.957469	0.0098273	1	5	106%	75	125	1%	
Copper	A	mg/kg-dr	0.2095	53.8393169		51.397916	1.653494	54.026024	0.1717204	1	5	102%	75	125	0%	
Lead	A	mg/kg-dr	0.2195	56.4092127		51.397916	2.4830400	57.214613	0.1147201	1	5	105%	75	125	1%	
Manganese	A	mg/kg-dr	1.829	470.033941		256.98958	167.18152	477.25988	0.1230980	1	5	118%	75	125	2%	
Molybdenum	A	mg/kg-dr	0.2082	53.5052304		51.397916	0.8870545	54.257454	0.0240851	1	5	102%	75	125	1%	
Nickel	A	mg/kg-dr	0.2216	56.9488908		51.397916	2.6591277	57.60033	0.0445723	1	5	106%	75	125	1%	
Selenium	A	mg/kg-dr	0.1996	51.2951200		51.397916	0	51.531724	0.0973477	1	5	100%	75	125	0%	
Silver	A	mg/kg-dr	0.1093	28.0889610		25.698958	0.0643789	28.543021	0.0275596	1	1	109%	75	125	2%	
Strontium	A	mg/kg-dr	0.511	131.321675		51.397916	30.535438	75.806149	0.0131424	1	5	196%	75	125	54%	SR
Thallium	A	mg/kg-dr	0.1984	50.9867325		51.397916	0	51.428866	0.0122276	1	5	99%	75	125	1%	
Thorium	A	mg/kg-dr	0.2252	57.8740533		51.397916	1.9855668	57.677473	0.0870681	1	5	109%	75	125	0%	
Thorium 232	A	mg/kg-dr	0.2252	57.8740533		51.397916	1.9855668	57.677473	0.0870681	1	5	109%	75	125	0%	
Tin	A	mg/kg-dr	0.2209	56.7689981		51.397916	1.1799402	57.240328	0.2201887	1	5	108%	75	125	1%	
Titanium	A	mg/kg-dr	0.541	139.031362		51.397916	33.156396	138.36936	0.1004829	1	5	206%	75	125	0%	S
Uranium	A	mg/kg-dr	0.2186	56.1779220		51.397916	1.445853	56.777468	0.0032920	1	5	106%	75	125	1%	
Vanadium	A	mg/kg-dr	0.2543	65.3524500		51.397916	7.2877912	68.786108	0.4302006	1	5	113%	75	125	5%	
Zinc	A	mg/kg-dr	0.2401	61.703198		51.397916	8.0893464	61.431780	0.6280825	1	5	104%	75	125	0%	
Aluminum as Al2O3	C	mg/kg-dr	35.2485	9058.49719		0	0	7547.6232	3.3339155	9.45	100000	0%	0	0	18%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685716	B18020068-014	6010.20-S	MSD3		2/6/2018 7:23:00	5	118169	2/5/2018 7:5	1E+07	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.01056	2.71380996		0	0.1050674	2.7913017	0.0042943	0.05	0	0%	0	0	3%	
Barium as BaO	C	mg/kg-dr	0.693952	178.338433		0	92.937659	151.71927	0.0381027	1.12	100000	0%	0	0	16%	
Barium, TCLP equivalent (calc)	C	mg/L-dry		7.96102763		0	4.1487371	6.7727482	0.0017009	0.0499968	0	0%	0	0	16%	
Cadmium, TCLP equivalent (calc)	C	mg/L-dry	0.005115	1.3145017		0	0.0021756	1.3178647	0.0008853	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.01115	2.86543381		0	0.0855756	2.8851594	0.0151932	0.05	0	0%	0	0	1%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.010975	2.82046063		0	0.1241520	2.8607307	0.0057360	0.05	0	0%	0	0	1%	
Manganese as MnO	C	mg/kg-dr	2.32283	596.943104		0	212.32053	606.12004	0.1563345	1.27	100000	0%	0	0	2%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00998	2.56475600		0	0	2.5765862	0.0048674	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.005465	1.40444805		0	0.0032189	1.4271510	0.001378	0.05	0	0%	0	0	2%	
Strontium as SrO	C	mg/kg-dr	0.60298	154.959577		0	36.031817	89.451255	0.0155081	1.18	100000	0%	0	0	54%	
Thorium 232, Activity	C	pCi/g-dry	0.0245468	6.30827181		0	0.2164268	6.2868446	0.0094904	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.90347	232.182375		0	55.371182	231.07684	0.1678065	1.67	100000	0%	75	0	0%	
Uranium, Activity	C	pCi/g-dry	0.1479922	38.0324532		0	0.9788425	38.438346	0.0022287	0.677	3	0%	0	0	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685717	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:25:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000288	0.000288		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000346	0.000346		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000825	0.000825		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000133	0.000133		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	0.001556	0.001556		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000257	0.000257		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000337	0.000337		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000293	0.000293		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000177	0.000177		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000205	0.000205		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.00029	0.00029		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000911	0.000911		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.002823	0.002823		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000029	0.000029		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000454	0.000454		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000285	0.000285		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000421	0.000421		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685717	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:25:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	0.000249	0.000249		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000807	0.000807		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000356	0.000356		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000353	0.000353		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000353	0.000353		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000163	0.000163		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000725	0.000725		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000137	0.000137		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000244	0.000244		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000858	0.000858		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685718	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:28:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000055	0.000055		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000137	0.000137		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000615	0.000615		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000072	0.000072		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	0.000324	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.00015	0.00015		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000184	0.000184		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000131	0.000131		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000026	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000101	0.000101		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000144	0.000144		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000852	0.000852		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.001739	0.001739		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000027	0.000027		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000057	0.000057		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000189	0.000189		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000038	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000078	0.000078		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000435	0.000435		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000174	0.000174		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685718	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:28:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thorium	A	mg/L	-0.000007	0		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000007	0		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000115	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000329	0.000329		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000024	0.000024		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000174	0.000174		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000601	0.000601		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685719	B18020068-015	6010.20-S	SAMP		2/6/2018 7:31:00	5	118169	2/5/2018 7:5	0	0	18.13

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000241	0.07285636		0	0	0	0.0337497	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.01068	3.22865508		0	0	0	0.1010315	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.0116	3.50677892		0	0	0	0.2563576	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.02599	7.85699864		0	0	0	0.3574496	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.01832	5.53829223		0	0	0	0.0115603	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.0234	7.07401955		0	0	0	0.2020026	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.02728	8.24697664		0	0	0	0.1349505	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.001116	0.33737632		0	0	0	0.0283324	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.02523	7.62724416		0	0	0	0.0524324	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000677	0.20466287		0	0	0	0.1145145	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000427	0.12908574		0	0	0	0.0324196	1	1	0%	0	0	0%	J
Thallium	A	mg/kg-dr	0.000517	0.15629351		0	0	0	0.0143838	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.02003	6.05523981		0	0	0	0.1024221	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.02003	6.05523981		0	0	0	0.1024221	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.2471	74.7004372		0	0	0	0.1182026	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.007602	2.29814943		0	0	0	0.0038726	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.0499	15.0851955		0	0	0	0.5060645	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.117	35.3700978		0	0	0	0.7388420	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.9699	293.209041		0	0	0	0.0400196	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	1.086288	328.394126		0	0	0	0.044822	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		14.6595138		0	0	0	0.0020009	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.002072	0.62638327		0	0	0	0.0103873	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000592	0.17896665		0	0	0	0.0208291	1	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685719	B18020068-015	6010.20-S	SAMP		2/6/2018 7:31:00	5	118169	2/5/2018 7:5	0	0	18.13

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000296	0.00894833		0	0	0	0.0010415	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	0.3739	113.033159		0	0	0	0.1448058	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	0.474853	143.552111		0	0	0	0.1839033	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.1924	58.1641607		0	0	0	0.0154601	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.227032	68.6337097		0	0	0	0.0182429	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.000534	0.16143275		0	0	0	0.0050516	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0012995	0.39284993		0	0	0	0.0178725	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.001364	0.41234883		0	0	0	0.0067475	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.00003385	0.01023314		0	0	0	0.0057257	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.00002135	0.00645429		0	0	0	0.001621	0.05	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g-dry	0.00218327	0.66002114		0	0	0	0.0111640	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.412657	124.749730		0	0	0	0.1973984	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00514655	1.55584716		0	0	0	0.0026217	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685720	B18020068-016	6010.20-S	SAMP		2/6/2018 7:33:00	5	118169	2/5/2018 7:5	0	0	21.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000477	0.14712937		0	0	0	0.0344351	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.007695	2.37350212		0	0	0	0.1030831	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.02219	6.84444600		0	0	0	0.2615633	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.06053	18.6703162		0	0	0	0.3647081	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.03336	10.2898026		0	0	0	0.0117950	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.04787	14.7653731		0	0	0	0.2061045	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.05975	18.4297273		0	0	0	0.1376909	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.00082	0.25292680		0	0	0	0.0289077	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.06031	18.6024578		0	0	0	0.0534971	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.000704	0.21714691		0	0	0	0.1168398	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000296	0.09130041		0	0	0	0.0330779	1	1	0%	0	0	0%	J
Thallium	A	mg/kg-dr	0.000633	0.19524715		0	0	0	0.0146759	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.03138	9.67907686		0	0	0	0.104502	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.03138	9.67907686		0	0	0	0.104502	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.1751	54.0091255		0	0	0	0.1206029	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.004367	1.34698944		0	0	0	0.0039512	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.09352	28.8459932		0	0	0	0.5163408	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685720	B18020068-016	6010.20-S	SAMP		2/6/2018 7:33:00	5	118169	2/5/2018 7:5	0	0	21.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/kg-dr	0.1753	54.070815		0	0	0	0.7538452	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.799	246.449408		0	0	0	0.0408323	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.89488	276.023337		0	0	0	0.0457321	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		12.3216817		0	0	0	0.0020415	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.00421	1.29856321		0	0	0	0.0105982	1	5	0%	0	0	0%	
Cadmium	B	mg/kg-dr	0.001176	0.36273405		0	0	0	0.0212520	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000588	0.01813670		0	0	0	0.0010626	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg-dr	1.266	390.494305		0	0	0	0.1477463	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg-dr	1.60782	495.927768		0	0	0	0.1876378	1.27	100000	0%	0	0	0%	
Strontium	B	mg/kg-dr	0.5543	170.972349		0	0	0	0.015774	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.654074	201.747372		0	0	0	0.0186133	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.00038475	0.11867511		0	0	0	0.0051542	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.0030265	0.93351581		0	0	0	0.0182354	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0029875	0.92148636		0	0	0	0.0068845	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0000352	0.01085735		0	0	0	0.005842	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.0000148	0.00456502		0	0	0	0.0016539	0.05	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g-dry	0.00342042	1.05501938		0	0	0	0.0113907	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.292417	90.1952396		0	0	0	0.2014068	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00295646	0.91191185		0	0	0	0.002675	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685721	CCV	ICPMS-6020-W-	CCV		2/6/2018 7:36:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.1333	0.1333		0.05	0	0	0.0002849	0.1	4.5	267%	90	110	0%	S
Antimony	A	mg/L	0.05167	0.05167		0.05	0	0	3.047E-05	0.05	18	103%	90	110	0%	
Arsenic	A	mg/L	0.0512	0.0512		0.05	0	0	6.629E-05	0.005	18	102%	90	110	0%	
Barium	A	mg/L	0.05354	0.05354		0.05	0	0	6.437E-05	0.1	18	107%	90	110	0%	
Beryllium	A	mg/L	0.05128	0.05128		0.05	0	0	8.97E-06	0.001	4.5	103%	90	110	0%	
Boron	A	mg/L	0.04993	0.04993		0.05	0	0	0.00141	0.1	4.5	100%	90	110	0%	
Cadmium	A	mg/L	0.05039	0.05039		0.05	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.05176	0.05176		0.05	0	0	2.257E-05	0.001	4.5	104%	90	110	0%	
Chromium	A	mg/L	0.05162	0.05162		0.05	0	0	5.576E-05	0.01	18	103%	90	110	0%	
Cobalt	A	mg/L	0.0517	0.0517		0.05	0	0	3.904E-05	0.01	18	103%	90	110	0%	
Copper	A	mg/L	0.0511	0.0511		0.05	0	0	7.681E-05	0.01	4.5	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685721	CCV	ICPMS-6020-W-	CCV		2/6/2018 7:36:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron	A	mg/L	1.467	1.467		1.3	0	0	0.000175	0.02	4.5	113%	90	110	0%	S
Lanthanum	A	mg/L	0.05255	0.05255		0.05	0	0	0.0000111	0.001	4.5	105%	90	110	0%	
Lead	A	mg/L	0.05069	0.05069		0.05	0	0	2.956E-05	0.01	18	101%	90	110	0%	
Manganese	A	mg/L	0.054	0.054		0.05	0	0	3.649E-05	0.01	18	108%	90	110	0%	
Mercury	A	mg/L	0.001027	0.001027		0.001	0	0	1.289E-05	0.001	0.36	103%	90	110	0%	
Molybdenum	A	mg/L	0.05085	0.05085		0.05	0	0	2.302E-05	0.005	9	102%	90	110	0%	
Nickel	A	mg/L	0.05181	0.05181		0.05	0	0	7.128E-05	0.01	4.5	104%	90	110	0%	
Selenium	A	mg/L	0.05264	0.05264		0.05	0	0	0.0001532	0.005	18	105%	90	110	0%	
Silver	A	mg/L	0.01992	0.01992		0.02	0	0	2.959E-05	0.005	1.8	100%	90	110	0%	
Strontium	A	mg/L	0.05076	0.05076		0.05	0	0	1.229E-05	0.1	18	102%	90	110	0%	
Thallium	A	mg/L	0.04946	0.04946		0.05	0	0	1.434E-05	0.1	18	99%	90	110	0%	
Thorium	A	mg/L	0.0492	0.0492		0.05	0	0	5.767E-05	0.001	4.5	98%	90	110	0%	
Thorium 232	A	mg/L	0.0492	0.0492		0.05	0	0	5.767E-05	0.01	4.5	98%	90	110	0%	
Tin	A	mg/L	0.05199	0.05199		0.05	0	0	5.199E-05	0.1	9	104%	90	110	0%	
Titanium	A	mg/L	0.05138	0.05138		0.05	0	0	0.0001736	0.01	18	103%	90	110	0%	
Uranium	A	mg/L	0.05075	0.05075		0.05	0	0	1.332E-05	0.001	4.5	101%	90	110	0%	
Vanadium	A	mg/L	0.05189	0.05189		0.05	0	0	7.351E-05	0.1	18	104%	90	110	0%	
Zinc	A	mg/L	0.05042	0.05042		0.05	0	0	0.0002495	0.01	4.5	101%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685722	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:39:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000028	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000001	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000527	0.000527		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000044	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000671	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.00004	0.00004		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000157	0.000157		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000029	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000049	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000003	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000113	0.000113		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000787	0.000787		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685722	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:39:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Mercury	A	mg/L	0.000008	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000096	0.000096		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000184	0.000184		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000011	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000186	0.000186		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000336	0.000336		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000023	0.000023		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000151	0.000151		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000151	0.000151		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000141	0.000141		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000413	0.000413		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	-0.000018	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000053	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000281	0.000281		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685723	CCB	ICPMS-6020-W-	CCB		2/6/2018 7:41:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.02628	0.02628		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000089	-0.000089		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000088	-0.000088		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000265	0.000265		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000116	-0.000116		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001127	-0.001127		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.00004	-0.00004		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000104	0.000104		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000153	-0.000153		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000134	-0.000134		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000095	-0.000095		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.04223	0.04223		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000062	0.000062		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000619	0.000619		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000629	0.000629		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000007	0.000007		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685723	CCB	ICPMS-6020-W-	CCB		2/6/2018 7:41:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	A	mg/L	-0.00009	-0.00009		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000029	-0.000029		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000024	0.000024		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000015	0.000015		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000133	0.000133		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000031	-0.000031		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000116	-0.000116		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000116	-0.000116		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000141	-0.000141		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000139	0.000139		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000097	-0.000097		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000021	-0.000021		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000088	0.000088		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685724	B18020068-017	6010.20-S	SAMP		2/6/2018 7:44:00	5	118169	2/5/2018 7:5	0	0	11.51

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.000725	0.20318681		0	0	0	0.031288	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.02866	8.03218462		0	0	0	0.0936621	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.008492	2.37994807		0	0	0	0.2376585	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.01172	3.28461981		0	0	0	0.3313767	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.02889	8.09664388		0	0	0	0.0107171	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.01566	4.38883500		0	0	0	0.1872682	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.01974	5.53228627		0	0	0	0.1251070	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.004537	1.27152902		0	0	0	0.0262657	1	5	0%	0	0	0%	
Nickel	A	mg/kg-dr	0.03421	9.58761465		0	0	0	0.0486079	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.006722	1.88389201		0	0	0	0.1061616	1	5	0%	0	0	0%	
Silver	A	mg/kg-dr	0.000349	0.09780992		0	0	0	0.0300548	1	1	0%	0	0	0%	J
Thallium	A	mg/kg-dr	0.000144	0.04035710		0	0	0	0.0133347	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.009963	2.7922071		0	0	0	0.0949513	1	5	0%	0	0	0%	
Thorium 232	A	mg/kg-dr	0.009963	2.7922071		0	0	0	0.0949513	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.8761	245.533739		0	0	0	0.1095807	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.01853	5.1931745		0	0	0	0.0035901	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.07291	20.4335862		0	0	0	0.4691513	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685724	B18020068-017	6010.20-S	SAMP		2/6/2018 7:44:00	5	118169	2/5/2018 7:5	0	0	11.51

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/kg-dr	0.1185	33.2105331		0	0	0	0.6849497	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.8895	249.289191		0	0	0	0.0371005	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.99624	279.203894		0	0	0	0.0415526	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		12.4636618		0	0	0	0.0018549	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.002357	0.66056731		0	0	0	0.0096297	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000951	0.26652504		0	0	0	0.0193098	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.00004755	0.01332625		0	0	0	0.0009655	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg-dr	0.3952	110.757828		0	0	0	0.0143324	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.466336	130.694238		0	0	0	0.0169122	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.001433	0.40160923		0	0	0	0.0046831	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.000586	0.16423099		0	0	0	0.0165688	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.000987	0.27661431		0	0	0	0.0062554	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0003361	0.09419460		0	0	0	0.0053081	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.00001745	0.0048905		0	0	0	0.0015027	0.05	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g-dry	0.00108597	0.30435057		0	0	0	0.0103497	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	1.463087	410.041343		0	0	0	0.1829998	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.01254481	3.51577913		0	0	0	0.0024305	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685725	B18020068-018	6010.20-S	SAMP		2/6/2018 7:47:00	5	118169	2/5/2018 7:5	0	0	15.08

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/kg-dr	0.00019	0.05438001		0	0	0	0.0319525	1	5	0%	0	0	0%	J
Arsenic	A	mg/kg-dr	0.007262	2.07846107		0	0	0	0.0956516	1	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.01119	3.20269614		0	0	0	0.2427066	1	5	0%	0	0	0%	
Chromium	A	mg/kg-dr	0.02768	7.92230823		0	0	0	0.3384154	1	5	0%	0	0	0%	
Cobalt	A	mg/kg-dr	0.01891	5.41224164		0	0	0	0.0109447	1	5	0%	0	0	0%	
Copper	A	mg/kg-dr	0.03118	8.92404518		0	0	0	0.1912459	1	5	0%	0	0	0%	
Lead	A	mg/kg-dr	0.03137	8.97842518		0	0	0	0.1277644	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg-dr	0.001503	0.43017447		0	0	0	0.0268237	1	5	0%	0	0	0%	J
Nickel	A	mg/kg-dr	0.03109	8.89828623		0	0	0	0.0496404	1	5	0%	0	0	0%	
Selenium	A	mg/kg-dr	0.001098	0.31425919		0	0	0	0.1084166	1	5	0%	0	0	0%	J
Silver	A	mg/kg-dr	0.000205	0.05867316		0	0	0	0.0306932	1	1	0%	0	0	0%	J
Thallium	A	mg/kg-dr	0.000379	0.10847380		0	0	0	0.0136179	1	5	0%	0	0	0%	J
Thorium	A	mg/kg-dr	0.0218	6.23939015		0	0	0	0.0969681	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685725	B18020068-018	6010.20-S	SAMP		2/6/2018 7:47:00	5	118169	2/5/2018 7:5	0	0	15.08

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thorium 232	A	mg/kg-dr	0.0218	6.23939015		0	0	0	0.0969681	1	5	0%	0	0	0%	
Titanium	A	mg/kg-dr	0.2726	78.0209979		0	0	0	0.1119083	1	5	0%	0	0	0%	
Uranium	A	mg/kg-dr	0.003592	1.02806832		0	0	0	0.0036664	1	5	0%	0	0	0%	
Vanadium	A	mg/kg-dr	0.05571	15.9447901		0	0	0	0.4791165	1	5	0%	0	0	0%	
Zinc	A	mg/kg-dr	0.1188	34.0018142		0	0	0	0.6994986	1	5	0%	0	0	0%	
Barium	B	mg/kg-dr	0.2898	82.9438195		0	0	0	0.0378886	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg-dr	0.324576	92.8970778		0	0	0	0.0424352	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L-dry		4.14692555		0	0	0	0.0018943	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg-dr	0.002118	0.60619396		0	0	0	0.0098342	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg-dr	0.000592	0.16943665		0	0	0	0.0197199	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.0000296	0.00847183		0	0	0	0.000986	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg-dr	0.3928	112.423507		0	0	0	0.0146368	1	5	0%	0	0	0%	
Strontium as SrO	B	mg/kg-dr	0.463504	132.659738		0	0	0	0.0172714	1.18	100000	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L-dry	0.0003631	0.10392305		0	0	0	0.0047826	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L-dry	0.001384	0.39611541		0	0	0	0.0169208	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L-dry	0.0015685	0.44892126		0	0	0	0.0063882	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L-dry	0.0000549	0.01571296		0	0	0	0.0054208	0.05	0	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	C	mg/L-dry	0.00001025	0.00293366		0	0	0	0.0015347	0.05	0	0%	0	0	0%	J
Thorium 232, Activity	C	pCi/g-dry	0.0023762	0.68009353		0	0	0	0.0105695	0.109	100000	0%	0	0	0%	
Titanium as TiO2	C	mg/kg-dr	0.455242	130.295067		0	0	0	0.1868869	1.67	100000	0%	0	0	0%	
Uranium, Activity	C	pCi/g-dry	0.00243178	0.69600225		0	0	0	0.0024821	0.677	3	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685726	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:49:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000113	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000054	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000672	0.000672		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000093	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001171	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000005	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000166	0.000166		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	-0.000248	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000088	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685726	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:49:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	A	mg/L	0.000105	0.000105		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000087	0.000087		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000676	0.000676		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000003	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000165	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000012	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000269	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000089	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000466	0.000466		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	-0.000074	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000174	0		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000174	0		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000333	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000322	0.000322		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	-0.000073	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000018	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000155	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685727	CCV	ICPMS-200.8-W	CCV		2/6/2018 7:52:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.07442	0.07442		0.05	0	0	0.0002849	0.1	4.5	149%	90	110	0%	S
Antimony	A	mg/L	0.0524	0.0524		0.05	0	0	3.047E-05	0.05	18	105%	90	110	0%	
Arsenic	A	mg/L	0.05095	0.05095		0.05	0	0	6.629E-05	0.005	18	102%	90	110	0%	
Barium	A	mg/L	0.05356	0.05356		0.05	0	0	6.437E-05	0.1	18	107%	90	110	0%	
Beryllium	A	mg/L	0.05091	0.05091		0.05	0	0	8.97E-06	0.001	4.5	102%	90	110	0%	
Boron	A	mg/L	0.04986	0.04986		0.05	0	0	0.00141	0.1	4.5	100%	90	110	0%	
Cadmium	A	mg/L	0.05122	0.05122		0.05	0	0	1.468E-05	0.001	18	102%	90	110	0%	
Cerium	A	mg/L	0.05271	0.05271		0.05	0	0	2.257E-05	0.001	4.5	105%	90	110	0%	
Chromium	A	mg/L	0.05296	0.05296		0.05	0	0	5.576E-05	0.01	18	106%	90	110	0%	
Cobalt	A	mg/L	0.05327	0.05327		0.05	0	0	3.904E-05	0.01	18	107%	90	110	0%	
Copper	A	mg/L	0.05029	0.05029		0.05	0	0	7.681E-05	0.01	4.5	101%	90	110	0%	
Iron	A	mg/L	1.489	1.489		1.3	0	0	0.000175	0.02	4.5	115%	90	110	0%	S
Lanthanum	A	mg/L	0.05303	0.05303		0.05	0	0	0.0000111	0.001	4.5	106%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685727	CCV	ICPMS-200.8-W CCV			2/6/2018 7:52:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	0.05109	0.05109		0.05	0	0	2.956E-05	0.01	18	102%	90	110	0%	
Manganese	A	mg/L	0.05542	0.05542		0.05	0	0	3.649E-05	0.01	18	111%	90	110	0%	S
Mercury	A	mg/L	0.001081	0.001081		0.001	0	0	1.289E-05	0.001	0.36	108%	90	110	0%	
Molybdenum	A	mg/L	0.05159	0.05159		0.05	0	0	2.302E-05	0.005	9	103%	90	110	0%	
Nickel	A	mg/L	0.05313	0.05313		0.05	0	0	7.128E-05	0.01	4.5	106%	90	110	0%	
Selenium	A	mg/L	0.0517	0.0517		0.05	0	0	0.0001532	0.005	18	103%	90	110	0%	
Silver	A	mg/L	0.0201	0.0201		0.02	0	0	2.959E-05	0.005	1.8	101%	90	110	0%	
Strontium	A	mg/L	0.05102	0.05102		0.05	0	0	1.229E-05	0.1	18	102%	90	110	0%	
Thallium	A	mg/L	0.04981	0.04981		0.05	0	0	1.434E-05	0.1	18	100%	90	110	0%	
Thorium	A	mg/L	0.04913	0.04913		0.05	0	0	5.767E-05	0.001	4.5	98%	90	110	0%	
Thorium 232	A	mg/L	0.04913	0.04913		0.05	0	0	5.767E-05	0.01	4.5	98%	90	110	0%	
Tin	A	mg/L	0.05268	0.05268		0.05	0	0	5.199E-05	0.1	9	105%	90	110	0%	
Titanium	A	mg/L	0.05159	0.05159		0.05	0	0	0.0001736	0.01	18	103%	90	110	0%	
Uranium	A	mg/L	0.05217	0.05217		0.05	0	0	1.332E-05	0.001	4.5	104%	90	110	0%	
Vanadium	A	mg/L	0.05306	0.05306		0.05	0	0	7.351E-05	0.1	18	106%	90	110	0%	
Zinc	A	mg/L	0.0501	0.0501		0.05	0	0	0.0002495	0.01	4.5	100%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685728	Rinse	ICPMS-200.8-W SAMP			2/6/2018 7:55:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000059	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000009	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000205	0.000205		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000072	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001187	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000015	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000086	0.000086		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000303	0.000303		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000072	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000048	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000063	0.000063		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000308	0.000308		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000015	0.000015		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000104	0.000104		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685728	Rinse	ICPMS-200.8-W	SAMP		2/6/2018 7:55:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/L	0.000011	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000091	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000134	0.000134		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000161	0.000161		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000112	0.000112		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000128	0.000128		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000128	0.000128		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000211	0.000211		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.00027	0.00027		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	-0.00003	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000149	0.000149		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000113	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685729	CCB	ICPMS-200.8-W	CCB		2/6/2018 7:57:00	1	R294337		0	0	

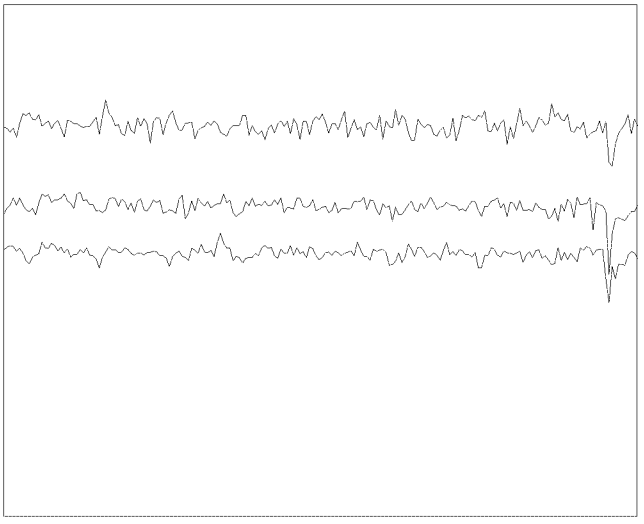
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01019	0.01019		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000118	-0.000118		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000106	-0.000106		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000127	0.000127		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000137	-0.000137		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001618	-0.001618		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000067	-0.000067		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.00005	0.00005		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000117	0.000117		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000143	-0.000143		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000119	-0.000119		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.05498	0.05498		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000029	0.000029		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000101	0.000101		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000882	0.000882		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000006	-0.000006		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000139	-0.000139		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000074	-0.000074		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11685729	CCB	ICPMS-200.8-W	CCB		2/6/2018 7:57:00	1	R294337		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	-0.0001	-0.0001		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000023	-0.000023		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000043	0.000043		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.000027	0.000027		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000128	-0.000128		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000128	-0.000128		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	-0.000184	-0.000184		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000047	0.000047		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.00011	-0.00011		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000028	0.000028		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000053	-0.000053		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

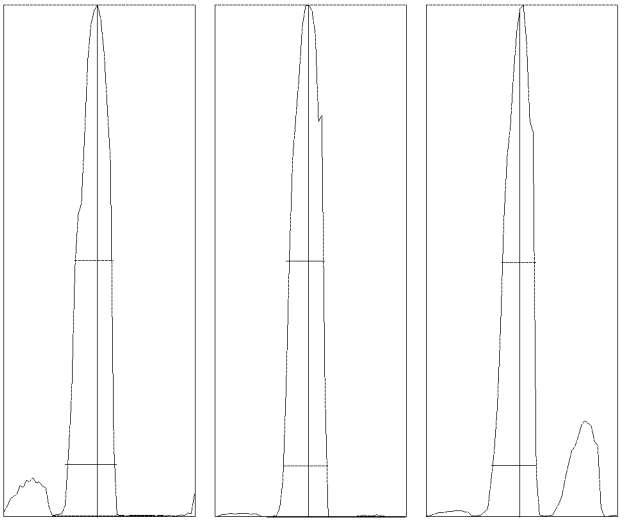
Tune Report

Tune File : ATUNE.U
Comment :



Integration Time:	0.1000 sec	
Sampling Period:	0.6200 sec	
n:	200	
Oxide:	156/140	1.170%
Doubly Charged:	70/140	0.913%

m/z	Range	Count	Mean	RSD%	Background
7	10,000	7641.0	7638.0	2.22	241.20
89	20,000	12161.0	12113.1	2.62	91.20
205	20,000	10098.0	10265.7	2.66	201.60
156/140	2	1.048%	1.181%	8.90	
70/140	2	0.861%	0.910%	12.92	



m/z:	7	89	205
Height:	7,710	11,958	10,349
Axis:	7.00	89.00	205.00
W-50%:	0.60	0.60	0.55
W-10%:	0.800	0.700	0.700

Integration Time:	0.1000 sec
Acquisition Time:	22.7600 sec

Y axis : Linear

Generated : Feb 06, 2018 14:05:14
Printed : Feb 06, 2018 14:05:16

ED_004985_00011411-00808

Tune Report

Tune File : ATUNE.U
Comment :

Tuning Parameters

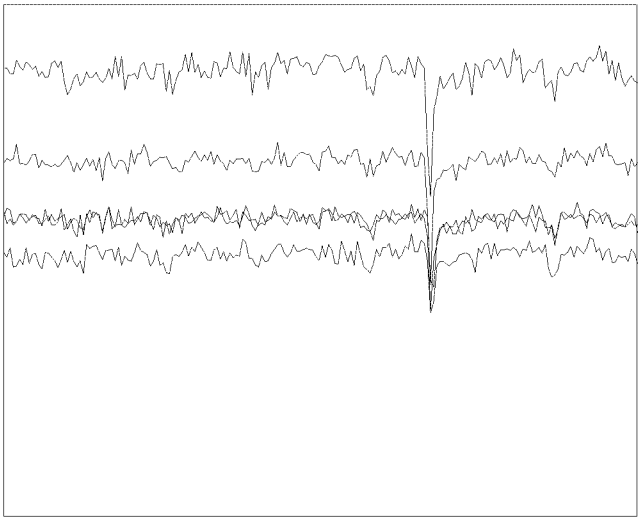
===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	-195 V	AMU Gain	:	128
RF Matching	:	1.8 V	Extract 2	:	-80 V	AMU Offset	:	124
Smpl Depth	:	10 mm	Einzel 1,3	:	-100 V	Axis Gain	:	0.9996
Torch-H	:	-1.1 mm	Einzel 2	:	0 V	Axis Offset	:	-0.16
Torch-V	:	-1.5 mm	Omega Bias	:	-180 V	QP Bias	:	0
Carrier Gas	:	1.02 L/min	Omega (+)	:	18 V			
Makeup Gas	:	0 L/min	Omega (-)	:	-22 V	===Detector Parameters==		
Optional Gas	:	--- %	QP Focus	:	10 V	Discriminator	:	8.9
Nebulizer Pump	:	0.1 rps	Plate Bias	:	-5 V	Analog HV	:	1790
Sample Pump	:	--- rps				Pulse HV	:	1410
S/C Temp	:	2 degC						

Generated : Feb 06, 2018 14:05:14
Printed : Feb 06, 2018 14:05:19

ED_004985_00011411-00809

Sensitivity

Tune File : ATUNE.U



Integration Time: 0.1000 sec
Sampling Period: 0.5100 sec
n: 200

m/z	Range	Count	Mean	RSD%
9	20,000	11411.0	11609.2	3.11
24	1,000,000	494599.0	510753.1	3.68
59	20,000	11086.0	11562.8	3.35
115	10,000	6909.0	6932.0	3.41
208	5,000	4238.0	4346.4	3.40

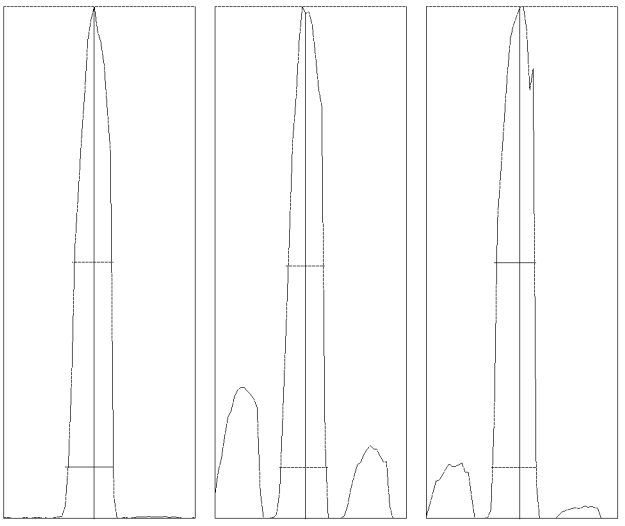
Tuning Parameters

===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	-195 V	AMU Gain	:	128
RF Matching	:	1.8 V	Extract 2	:	-80 V	AMU Offset	:	124
Smpl Depth	:	10 mm	Einzel 1,3	:	-100 V	Axis Gain	:	0.9996
Torch-H	:	-1.1 mm	Einzel 2	:	0 V	Axis Offset	:	-0.16
Torch-V	:	-1.5 mm	Omega Bias	:	-180 V	QP Bias	:	0
Carrier Gas	:	1.02 L/min	Omega (+)	:	18 V			
Makeup Gas	:	0 L/min	Omega (-)	:	-22 V	===Detector Parameters==		
Optional Gas	:	--- %	QP Focus	:	10 V	Discriminator	:	8.9
Nebulizer Pump	:	0.1 rps	Plate Bias	:	-5 V	Analog HV	:	1790
Sample Pump	:	--- rps				Pulse HV	:	1410
S/C Temp	:	2 degC						

Generated : Feb 06, 2018 14:07:35
Printed : Feb 06, 2018 14:07:40

Resolution/Axis

Tune File : ATUNE.U



m/z:	9	24	59
Height:	12,220	484,589	11,202
Axis:	8.95	23.95	59.00
W-50%:	0.65	0.60	0.65
W-10%:	0.7500	0.7500	0.700

Integration Time: 0.1000 sec
Acquisition Time: 22.2600 sec

Y axis : Linear

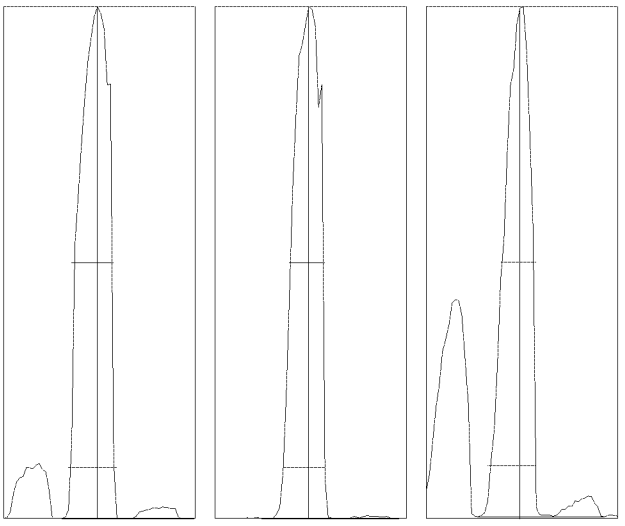
Tuning Parameters

===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	-195 V	AMU Gain	:	128
RF Matching	:	1.8 V	Extract 2	:	-80 V	AMU Offset	:	124
Smpl Depth	:	10 mm	Einzel 1,3	:	-100 V	Axis Gain	:	0.9996
Torch-H	:	-1.1 mm	Einzel 2	:	0 V	Axis Offset	:	-0.16
Torch-V	:	-1.5 mm	Omega Bias	:	-180 V	QP Bias	:	0
Carrier Gas	:	1.02 L/min	Omega (+)	:	18 V			
Makeup Gas	:	0 L/min	Omega (-)	:	-22 V	===Detector Parameters==		
Optional Gas	:	--- %	QP Focus	:	10 V	Discriminator	:	8.9
Nebulizer Pump	:	0.1 rps	Plate Bias	:	-5 V	Analog HV	:	1790
Sample Pump	:	--- rps				Pulse HV	:	1410
S/C Temp	:	2 degC						

Generated : Feb 06, 2018 14:08:07
Printed : Feb 06, 2018 14:08:12

Resolution/Axis

Tune File : ATUNE.U



m/z:	59	115	208
Height:	12,292	7,384	4,460
Axis:	59.00	115.00	208.00
W-50%:	0.65	0.55	0.55
W-10%:	0.7500	0.6500	0.7500

Integration Time: 0.1000 sec
Acquisition Time: 22.5600 sec

Y axis : Linear

Tuning Parameters

===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	-195 V	AMU Gain	:	128
RF Matching	:	1.8 V	Extract 2	:	-80 V	AMU Offset	:	124
Smpl Depth	:	10 mm	Einzel 1,3	:	-100 V	Axis Gain	:	0.9996
Torch-H	:	-1.1 mm	Einzel 2	:	0 V	Axis Offset	:	-0.16
Torch-V	:	-1.5 mm	Omega Bias	:	-180 V	QP Bias	:	0
Carrier Gas	:	1.02 L/min	Omega (+)	:	18 V			
Makeup Gas	:	0 L/min	Omega (-)	:	-22 V	===Detector Parameters==		
Optional Gas	:	--- %	QP Focus	:	10 V	Discriminator	:	8.9
Nebulizer Pump	:	0.1 rps	Plate Bias	:	-5 V	Analog HV	:	1790
Sample Pump	:	--- rps				Pulse HV	:	1410
S/C Temp	:	2 degC						

Generated : Feb 06, 2018 14:08:45
Printed : Feb 06, 2018 14:08:50

P/A Factor Tuning Report

Acquired:Feb 6 2018 02:11 pm

Mass[amu]	Element	P/A Factor
9	Be	Sensitivity too high
27	Al	Sensitivity too high
47	Ti	0.078924
51	V	Sensitivity too high
52	Cr	Sensitivity too high
53	Cr	0.084927
55	Mn	Sensitivity too high
59	Co	Sensitivity too high
60	Ni	Sensitivity too high
62	Ni	0.091633
63	Cu	Sensitivity too high
65	Cu	Sensitivity too high
66	Zn	0.095742
75	As	Sensitivity too high
77	Se	Sensitivity too low
82	Se	Sensitivity too low
88	Sr	Sensitivity too high
95	Mo	Sensitivity too high
97	Mo	0.092972
98	Mo	Sensitivity too high
107	Ag	0.099777
109	Ag	0.100297
111	Cd	0.102873
114	Cd	Sensitivity too high
118	Sn	Sensitivity too high
121	Sb	Sensitivity too high
123	Sb	Sensitivity too high
135	Ba	0.100633
137	Ba	Sensitivity too high
203	Tl	Sensitivity too high
205	Tl	Sensitivity too high
206	Pb	Sensitivity too high
207	Pb	Sensitivity too high
208	Pb	Sensitivity too high
232	Th	Sensitivity too high
238	U	Sensitivity too high

===Detector Parameters===
Discriminator: 8.9 mV
Analog HV: 1790 V
Pulse HV: 1410 V

P/A Factor Tuning Report

Acquired:Feb 6 2018 02:12 pm

Mass[amu]	Element	P/A Factor
9	Be	Sensitivity too low
27	Al	0.078754
47	Ti	0.078924
51	V	0.081141
52	Cr	0.083903
53	Cr	0.084927
55	Mn	0.085833
59	Co	0.090415
60	Ni	Sensitivity too low
62	Ni	0.091633
63	Cu	0.094505
65	Cu	0.094448
66	Zn	0.095742
75	As	0.090803
77	Se	Sensitivity too low
82	Se	Sensitivity too low
88	Sr	0.092870
95	Mo	Sensitivity too low
97	Mo	0.092972
98	Mo	0.091555
107	Ag	0.099777
109	Ag	0.100297
111	Cd	0.102873
114	Cd	0.101203
118	Sn	0.100057
121	Sb	0.099963
123	Sb	0.100071
135	Ba	0.100633
137	Ba	Sensitivity too low
203	Tl	0.111257
205	Tl	0.112365
206	Pb	Sensitivity too low
207	Pb	Sensitivity too low
208	Pb	0.111882
232	Th	0.111237
238	U	0.111256

===Detector Parameters===
Discriminator: 8.9 mV
Analog HV: 1790 V
Pulse HV: 1410 V

P/A Factor Tuning Report

Acquired:Feb 6 2018 02:14 pm

Mass[amu]	Element	P/A Factor
9	Be	0.064221
27	Al	0.078754
47	Ti	0.078363
51	V	0.081141
52	Cr	0.083903
53	Cr	0.084260
55	Mn	0.085833
59	Co	0.090415
60	Ni	Sensitivity too high
62	Ni	0.091479
63	Cu	0.094505
65	Cu	0.094448
66	Zn	0.095577
75	As	0.090803
77	Se	Sensitivity too low
82	Se	Sensitivity too low
88	Sr	0.092870
95	Mo	0.092925
97	Mo	0.092035
98	Mo	0.091555
107	Ag	0.099794
109	Ag	0.100293
111	Cd	0.101394
114	Cd	0.101203
118	Sn	0.100057
121	Sb	0.099963
123	Sb	0.100071
135	Ba	0.099447
137	Ba	0.100631
203	Tl	0.112747
205	Tl	0.112365
206	Pb	0.111776
207	Pb	0.112078
208	Pb	0.111882
232	Th	0.111237
238	U	0.111256

===Detector Parameters===
Discriminator: 8.9 mV
Analog HV: 1790 V
Pulse HV: 1410 V

P/A Factor Tuning Report

Acquired:Feb 6 2018 02:14 pm

Mass[amu]	Element	P/A Factor
9	Be	0.062692
27	Al	0.079416
47	Ti	0.078363
51	V	0.081141
52	Cr	0.083903
53	Cr	0.082989
55	Mn	0.085833
59	Co	0.090415
60	Ni	0.091145
62	Ni	0.091479
63	Cu	0.094505
65	Cu	0.094652
66	Zn	0.093684
75	As	0.090927
77	Se	Sensitivity too low
82	Se	Sensitivity too low
88	Sr	0.092870
95	Mo	0.090634
97	Mo	0.090659
98	Mo	0.091931
107	Ag	0.099794
109	Ag	0.100293
111	Cd	0.100111
114	Cd	0.100968
118	Sn	0.099873
121	Sb	0.100201
123	Sb	0.099989
135	Ba	0.099447
137	Ba	0.099406
203	Tl	0.110695
205	Tl	0.112016
206	Pb	0.110327
207	Pb	0.110510
208	Pb	0.111637
232	Th	0.110324
238	U	0.110207

===Detector Parameters===
Discriminator: 8.9 mV
Analog HV: 1790 V
Pulse HV: 1410 V

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\009SMPL.D\009SMPL.D#
Date Acquired: Feb 6 2018 02:52 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 02:52 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.318	-0.318	ug/l	16.49	4500.00	770.00		P
11 B	-2.452	-2.452	ug/l	4.18	4500.00	4632.22		P
27 Al	-0.263	-0.263	ug/l	27.85	4500.00	7606.67		P
47 Ti	-0.381	-0.381	ug/l	22.19	4500.00	293.33		P
51 V	-0.317	-0.317	ug/l	9.87	4500.00	3949.89		P
52 Cr	-0.273	-0.273	ug/l	15.72	4500.00	15220.00		P
53 Cr	-0.180	-0.180	ug/l	64.95	4500.00	1176.67		P
55 Mn	-0.340	-0.340	ug/l	5.77	4500.00	3963.33		P
57 Fe	5.565	5.565	ug/l	129.38	4500.00	32820.00		P
59 Co	-0.312	-0.312	ug/l	2.02	4500.00	3633.33		P
60 Ni	-0.188	-0.188	ug/l	45.90	4500.00	923.33		P
62 Ni	0.086	0.086	ug/l	433.25	4500.00	473.33		P
63 Cu	-0.272	-0.272	ug/l	5.27	4500.00	2363.33		P
65 Cu	-0.342	-0.342	ug/l	4.30	4500.00	1000.00		P
66 Zn	-0.241	-0.241	ug/l	17.04	4500.00	846.43		P
75 As	-0.337	-0.337	ug/l	10.73	4500.00	688.00		P
77 Se	-0.117	-0.117	ug/l	69.10	4500.00	184.00		P
79 Br	1.786	1.786	ug/l	---	#VALUE!	1140.00		P
82 Se	-0.254	-0.254	ug/l	71.75	4500.00	77.20		P
88 Sr	-0.213	-0.213	ug/l	9.66	4500.00	3363.33		P
95 Mo	-0.337	-0.337	ug/l	5.53	4500.00	890.00		P
97 Mo	-0.378	-0.378	ug/l	6.55	4500.00	613.33		P
98 Mo	-0.281	-0.281	ug/l	15.13	4500.00	1442.21		P
107 Ag	-0.033	-0.033	ug/l	83.63	1800.00	1582.22		P
109 Ag	-0.057	-0.057	ug/l	13.60	1800.00	1407.78		P
111 Cd	-0.284	-0.284	ug/l	24.52	4500.00	1133.51		P
114 Cd	-0.249	-0.249	ug/l	11.73	4500.00	600.33		P
118 Sn	-0.123	-0.123	ug/l	45.10	4500.00	2396.67		P
121 Sb	-0.340	-0.340	ug/l	2.01	4500.00	1390.33		P
123 Sb	-0.370	-0.370	ug/l	6.07	4500.00	1024.00		P
135 Ba	-0.384	-0.384	ug/l	21.28	4500.00	230.00		P
137 Ba	-0.335	-0.335	ug/l	9.52	4500.00	480.00		P
139 La	0.034	0.034	ug/l	21.60	4500.00	790.00		P
140 Ce	0.030	0.030	ug/l	3.98	4500.00	906.67		P
199 Hg	0.002	0.002	ug/l	361.18	450.00	99.33		P
200 Hg	-0.001	-0.001	ug/l	1772.40	450.00	114.00		P
202 Hg	0.006	0.006	ug/l	64.86	450.00	140.67		P
203 Tl	-0.361	-0.361	ug/l	5.47	4500.00	1786.67		P
205 Tl	-0.390	-0.390	ug/l	3.05	4500.00	4050.00		P
206 Pb	-0.342	-0.342	ug/l	6.29	4500.00	1233.33		P
207 Pb	-0.329	-0.329	ug/l	18.88	4500.00	1273.33		P
208 Pb	-0.310	-0.310	ug/l	6.65	4500.00	5306.67		P
232 Th	-0.138	-0.138	ug/l	27.45	4500.00	10702.22		P
238 U	-0.268	-0.268	ug/l	4.88	4500.00	5653.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1115832.50	2.80	1115070.50	100.1	60.000002	-	125
72 Ge	1457129.00	3.61	1450340.60	100.5	60.000002	-	125
89 Y	1942687.10	1.40	1883286.30	103.2	60.000002	-	125
115 In	1996607.00	3.56	1898987.00	105.1	60.000002	-	125
209 Bi	4108491.00	1.35	3832273.50	107.2	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00817

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\010SMPL.D\010SMPL.D#
Date Acquired: Feb 6 2018 02:55 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 02:52 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.372	-0.372	ug/l	14.53	4500.00	664.44		P
11 B	-3.343	-3.343	ug/l	2.66	4500.00	3642.22		P
27 Al	-0.251	-0.251	ug/l	34.45	4500.00	7623.33		P
47 Ti	-0.431	-0.431	ug/l	9.33	4500.00	266.67		P
51 V	-0.365	-0.365	ug/l	16.59	4500.00	3583.09		P
52 Cr	-0.387	-0.387	ug/l	34.48	4500.00	14460.00		P
53 Cr	-0.331	-0.331	ug/l	32.06	4500.00	1060.00		P
55 Mn	-0.374	-0.374	ug/l	2.98	4500.00	3686.67		P
57 Fe	0.240	0.240	ug/l	1037.00	4500.00	31853.33		P
59 Co	-0.395	-0.395	ug/l	2.57	4500.00	2996.67		P
60 Ni	-0.340	-0.340	ug/l	13.21	4500.00	650.00		P
62 Ni	-0.195	-0.195	ug/l	75.74	4500.00	396.67		P
63 Cu	-0.365	-0.365	ug/l	3.26	4500.00	1956.67		P
65 Cu	-0.381	-0.381	ug/l	8.75	4500.00	920.00		P
66 Zn	-0.294	-0.294	ug/l	20.41	4500.00	779.79		P
75 As	-0.378	-0.378	ug/l	24.43	4500.00	619.25		P
77 Se	-0.269	-0.269	ug/l	85.59	4500.00	170.33		P
79 Br	0.461	0.461	ug/l	---	#VALUE!	823.33		P
82 Se	-0.373	-0.373	ug/l	34.70	4500.00	62.60		P
88 Sr	-0.270	-0.270	ug/l	9.66	4500.00	2766.67		P
95 Mo	-0.419	-0.419	ug/l	21.50	4500.00	700.00		P
97 Mo	-0.468	-0.468	ug/l	7.58	4500.00	483.33		P
98 Mo	-0.376	-0.376	ug/l	8.22	4500.00	1096.45		P
107 Ag	-0.118	-0.118	ug/l	6.90	1800.00	1080.00		P
109 Ag	-0.133	-0.133	ug/l	6.91	1800.00	966.67		P
111 Cd	-0.274	-0.274	ug/l	20.86	4500.00	1117.59		P
114 Cd	-0.285	-0.285	ug/l	8.63	4500.00	477.83		P
118 Sn	-0.259	-0.259	ug/l	21.16	4500.00	1883.33		P
121 Sb	-0.376	-0.376	ug/l	1.57	4500.00	1169.33		P
123 Sb	-0.393	-0.393	ug/l	1.89	4500.00	907.67		P
135 Ba	-0.283	-0.283	ug/l	22.36	4500.00	326.67		P
137 Ba	-0.346	-0.346	ug/l	12.56	4500.00	450.00		P
139 La	0.026	0.026	ug/l	10.98	4500.00	646.67		P
140 Ce	0.015	0.015	ug/l	62.60	4500.00	650.00		P
199 Hg	0.007	0.007	ug/l	140.40	450.00	104.33		P
200 Hg	0.001	0.001	ug/l	561.19	450.00	116.33		P
202 Hg	-0.006	-0.006	ug/l	50.13	450.00	113.67		P
203 Tl	-0.398	-0.398	ug/l	2.39	4500.00	1593.33		P
205 Tl	-0.416	-0.416	ug/l	0.62	4500.00	3703.33		P
206 Pb	-0.364	-0.364	ug/l	4.29	4500.00	1136.67		P
207 Pb	-0.406	-0.406	ug/l	10.82	4500.00	983.33		P
208 Pb	-0.362	-0.362	ug/l	3.62	4500.00	4410.00		P
232 Th	-0.264	-0.264	ug/l	4.48	4500.00	8411.11		P
238 U	-0.320	-0.320	ug/l	4.68	4500.00	4640.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1110020.80	0.74	1115070.50	99.5	60.000002	-	125
72 Ge	1456085.50	1.94	1450340.60	100.4	60.000002	-	125
89 Y	1938197.10	0.53	1883286.30	102.9	60.000002	-	125
115 In	1945783.30	1.71	1898987.00	102.5	60.000002	-	125
209 Bi	4085074.00	1.48	3832273.50	106.6	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00818

Cal Blk QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\011CALB
Date Acquired: Feb 6 2018 02:58 pm
Operator: JPV
Sample Name: Cal Blank
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLds
Last Cal Update: Feb 06 2018 02:52 pm
Sample Type: CalBlk
Total Dil Factor: 1.00

QC&ISTD Elements

Element		CPS Mean		SD	RSD(%)
6	Li		P		
9	Be	513.33	P	35.28	6.87
11	B	3668.89	P	75.01	2.04
27	Al	6396.67	P	187.70	2.93
45	Sc	1107762.00	A	23360.00	2.11
47	Ti	226.67	P	66.58	29.37
51	V	3237.47	P	330.40	10.21
52	Cr	13966.67	P	100.20	0.72
53	Cr	966.67	P	72.34	7.48
55	Mn	2836.67	P	156.90	5.53
57	Fe	31013.33	P	355.00	1.14
59	Co	2426.67	P	196.60	8.10
60	Ni	493.33	P	55.08	11.17
62	Ni	426.67	P	68.07	15.95
63	Cu	1583.33	P	319.70	20.19
65	Cu	700.00	P	52.92	7.56
66	Zn	556.42	P	63.46	11.41
72	Ge	1463531.00	A	21600.00	1.48
75	As	529.74	P	56.48	10.66
77	Se	149.67	P	10.02	6.69
79	Br	696.67	P	23.09	3.31
82	Se	51.67	P	21.17	40.97
83	Kr	183.33	P	11.93	6.51
88	Sr	1670.00	P	144.20	8.63
89	Y	1932167.00	A	14070.00	0.73
95	Mo	556.67	P	86.22	15.49
97	Mo	400.00	P	111.30	27.83
98	Mo	894.16	P	97.18	10.87
107	Ag	718.89	P	58.34	8.12
109	Ag	627.78	P	70.03	11.16
111	Cd	947.89	P	36.89	3.89
114	Cd	212.52	P	81.58	38.39
115	In	1952569.00	A	12860.00	0.66
118	Sn	1630.00	P	65.57	4.02
121	Sb	933.00	P	34.12	3.66
123	Sb	715.33	P	2.31	0.32
135	Ba	173.33	P	30.55	17.63
137	Ba	280.00	P	60.00	21.43
139	La	453.33	P	15.28	3.37
140	Ce	483.33	P	50.33	10.41
199	Hg	91.00	P	9.00	9.89
200	Hg	104.00	P	13.23	12.72
202	Hg	117.67	P	4.51	3.83
203	Tl	1183.33	P	70.95	6.00
205	Tl	2383.33	P	203.10	8.52
206	Pb	763.33	P	11.55	1.51
207	Pb	780.00	P	72.11	9.24
208	Pb	3116.67	P	172.10	5.52
209	Bi	4087580.00	A	80740.00	1.98
232	Th	6682.22	P	348.30	5.21
238	U	3456.67	P	32.15	0.93

ED_004985_00011411-00819

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\012CALS.D\012CALS.D#
Date Acquired: Feb 6 2018 03:00 pm
Operator: JPV
Sample Name: 0.5 ppb std
Misc Info: ICPMS-200.8-W-D
Vial Number: 4304
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:00 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	1305.56	P	48.34	3.70
11 B	4504.44	P	51.68	1.15
27 Al	9500.00	P	641.60	6.75
45 Sc	1104441.00	A	22090.00	2.00
47 Ti	530.00	P	78.10	14.74
51 V	6246.94	P	822.90	13.17
52 Cr	16926.67	P	740.40	4.37
53 Cr	1376.67	P	281.80	20.47
55 Mn	6590.00	P	282.10	4.28
57 Fe	34173.33	P	346.50	1.01
59 Co	6140.00	P	51.96	0.85
60 Ni	1363.33	P	57.74	4.24
62 Ni	606.67	P	47.26	7.79
63 Cu	3750.00	P	155.20	4.14
65 Cu	1736.67	P	116.80	6.73
66 Zn	1242.93	P	159.40	12.83
72 Ge	1438887.00	A	32610.00	2.27
75 As	1218.47	P	85.81	7.04
77 Se	198.00	P	23.26	11.75
79 Br	756.67	P	15.28	2.02
82 Se	111.40	P	14.03	12.59
88 Sr	6136.67	P	75.05	1.22
89 Y	1934774.00	A	45630.00	2.36
95 Mo	1426.67	P	80.83	5.67
97 Mo	1043.33	P	109.70	10.51
98 Mo	2278.88	P	223.10	9.79
107 Ag	1293.33	P	120.00	9.28
109 Ag	1157.78	P	137.90	11.91
111 Cd	1565.18	P	149.00	9.52
114 Cd	1666.87	P	85.93	5.16
115 In	1958652.00	A	46620.00	2.38
118 Sn	2703.33	P	415.20	15.36
121 Sb	3242.67	P	50.33	1.55
123 Sb	2566.33	P	19.86	0.77
135 Ba	650.00	P	30.00	4.62
137 Ba	983.33	P	58.59	5.96
139 La	8506.67	P	280.10	3.29
140 Ce	8456.67	P	237.60	2.81
199 Hg	101.33	P	5.13	5.06
200 Hg	117.67	P	12.58	10.69
202 Hg	125.67	P	14.01	11.15
203 Tl	3243.33	P	184.50	5.69
205 Tl	7823.33	P	90.18	1.15
206 Pb	2683.33	P	323.90	12.07
207 Pb	2470.00	P	79.37	3.21
208 Pb	10973.33	P	358.50	3.27
209 Bi	4099377.00	A	84350.00	2.06
232 Th	10226.67	P	201.70	1.97
238 U	11830.00	P	303.50	2.57

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1104440.90	2.00	1107761.60	99.7	60 - 125	
72 Ge	1438887.40	2.27	1463530.60	98.3	60 - 125	
89 Y	1934774.30	2.36	1932167.40	100.1	60 - 125	
115 In	1958652.40	2.38	1952569.30	100.3	60 - 125	
209 Bi	4099377.50	2.06	4087579.80	100.3	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00820

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\013CALS.D\013CALS.D#
Date Acquired: Feb 6 2018 03:03 pm
Operator: JPV
Sample Name: 10 ppb std
Misc Info: ICPMS-200.8-W-D
Vial Number: 4305
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:02 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	19051.11	P	105.10	0.55
11 B	14243.33	P	46.67	0.33
27 Al	57366.66	P	639.10	1.11
45 Sc	1101414.00	A	17110.00	1.55
47 Ti	5560.00	P	96.44	1.73
51 V	76302.94	P	1072.00	1.40
52 Cr	78356.66	P	1278.00	1.63
53 Cr	8480.00	P	257.10	3.03
55 Mn	83183.33	P	345.30	0.42
57 Fe	77983.33	P	685.30	0.88
59 Co	79550.00	P	462.90	0.58
60 Ni	18253.33	P	268.60	1.47
62 Ni	3056.67	P	160.70	5.26
63 Cu	43953.33	P	913.50	2.08
65 Cu	21480.00	P	157.20	0.73
66 Zn	13821.13	P	323.20	2.34
72 Ge	1458125.00	A	51650.00	3.54
75 As	16150.24	P	345.40	2.14
77 Se	1073.67	P	18.58	1.73
79 Br	723.33	P	60.28	8.33
82 Se	1233.07	P	78.13	6.34
88 Sr	103586.70	P	1507.00	1.45
89 Y	1939894.00	A	20670.00	1.07
95 Mo	19880.00	P	667.80	3.36
97 Mo	12710.00	P	381.20	3.00
98 Mo	32417.42	P	361.50	1.12
107 Ag	20052.22	P	90.21	0.45
109 Ag	19031.11	P	721.10	3.79
111 Cd	14354.04	P	186.30	1.30
114 Cd	30480.06	P	802.80	2.63
115 In	1976632.00	A	16470.00	0.83
118 Sn	32246.67	P	765.70	2.37
121 Sb	51282.67	P	758.80	1.48
123 Sb	39755.00	P	424.50	1.07
135 Ba	10233.33	P	408.70	3.99
137 Ba	17796.67	P	320.80	1.80
139 La	164653.30	P	930.40	0.57
140 Ce	158023.30	P	2508.00	1.59
199 Hg	248.33	P	11.24	4.53
200 Hg	305.00	P	21.28	6.98
202 Hg	396.00	P	19.52	4.93
203 Tl	51750.00	P	1609.00	3.11
205 Tl	122863.30	P	1860.00	1.51
206 Pb	40920.00	P	1272.00	3.11
207 Pb	37516.67	P	1188.00	3.17
208 Pb	168810.00	P	2660.00	1.58
209 Bi	4209146.00	A	26300.00	0.62
232 Th	122096.70	P	3959.00	3.24
238 U	181253.30	P	2300.00	1.27

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1101414.40	1.55	1107761.60	99.4	60 - 125	
72 Ge	1458124.60	3.54	1463530.60	99.6	60 - 125	
89 Y	1939893.80	1.07	1932167.40	100.4	60 - 125	
115 In	1976632.10	0.83	1952569.30	101.2	60 - 125	
209 Bi	4209146.00	0.62	4087579.80	103.0	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00821

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\014CALS.D\014CALS.D#
Date Acquired: Feb 6 2018 03:06 pm
Operator: JPV
Sample Name: 50 ppb std
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:05 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	100770.00	P	1633.00	1.62
11 B	61547.78	P	749.80	1.22
27 Al	279950.00	P	5931.00	2.12
45 Sc	1092760.00	A	28220.00	2.58
47 Ti	29843.33	P	432.50	1.45
51 V	404167.41	P	3561.00	0.88
52 Cr	358833.31	P	6698.00	1.87
53 Cr	41003.33	P	240.10	0.59
55 Mn	437120.00	P	4765.00	1.09
57 Fe	281746.69	P	2680.00	0.95
59 Co	409000.00	P	3754.00	0.92
60 Ni	92756.67	P	1997.00	2.15
62 Ni	14466.67	P	100.20	0.69
63 Cu	228186.70	P	621.70	0.27
65 Cu	110310.00	P	1421.00	1.29
66 Zn	68046.07	P	2467.00	3.63
72 Ge	1444677.00	A	22700.00	1.57
75 As	84009.39	P	555.50	0.66
77 Se	5048.33	P	166.70	3.30
79 Br	1023.33	P	55.08	5.38
82 Se	6340.53	P	41.17	0.65
88 Sr	547030.00	P	7823.00	1.43
89 Y	1919112.00	A	27090.00	1.41
95 Mo	108586.70	P	2129.00	1.96
97 Mo	67486.66	P	2227.00	3.30
98 Mo	172328.41	P	2418.00	1.40
107 Ag	113983.30	P	2662.00	2.34
109 Ag	109366.70	P	2202.00	2.01
111 Cd	71702.76	P	1101.00	1.54
114 Cd	158584.70	P	2877.00	1.81
115 In	1930555.00	A	10070.00	0.52
118 Sn	183486.70	P	1171.00	0.64
121 Sb	274589.31	P	3846.00	1.40
123 Sb	213152.30	P	3549.00	1.67
135 Ba	53183.33	P	661.10	1.24
137 Ba	91980.00	P	1690.00	1.84
139 La	871456.88	M	21440.00	2.46
140 Ce	833150.00	P	9887.00	1.19
199 Hg	1364.67	P	17.47	1.28
200 Hg	1901.00	P	10.82	0.57
202 Hg	2424.33	P	57.84	2.39
203 Tl	271333.31	P	7163.00	2.64
205 Tl	651410.00	P	9244.00	1.42
206 Pb	215870.00	P	4235.00	1.96
207 Pb	196963.30	P	3790.00	1.92
208 Pb	892800.00	P	17010.00	1.91
209 Bi	4144904.00	A	39240.00	0.95
232 Th	899011.13	P	9982.00	1.11
238 U	978744.81	M	14920.00	1.52

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1092759.90	2.58	1107761.60	98.6	60 - 125	
72 Ge	1444677.40	1.57	1463530.60	98.7	60 - 125	
89 Y	1919112.10	1.41	1932167.40	99.3	60 - 125	
115 In	1930554.90	0.52	1952569.30	98.9	60 - 125	
209 Bi	4144903.80	0.95	4087579.80	101.4	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00822

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\015CALS.D\015CALS.D#
Date Acquired: Feb 6 2018 03:08 pm
Operator: JPV
Sample Name: 100 ppb std
Misc Info: ICPMS-200.8-W-D
Vial Number: 4306
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:08 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	188293.30	P	2625.00	1.39
11 B	111044.40	P	1554.00	1.40
27 Al	518020.00	P	10620.00	2.05
45 Sc	1086336.00	A	13410.00	1.23
47 Ti	54770.00	P	952.20	1.74
51 V	756473.50	A	17140.00	2.27
52 Cr	664937.69	M	10340.00	1.56
53 Cr	75966.66	P	187.70	0.25
55 Mn	812491.31	A	21940.00	2.70
57 Fe	497816.69	P	6143.00	1.23
59 Co	756116.63	M	7339.00	0.97
60 Ni	173270.00	P	2272.00	1.31
62 Ni	26130.00	P	300.00	1.15
63 Cu	423816.69	P	4734.00	1.12
65 Cu	201970.00	P	4004.00	1.98
66 Zn	126031.20	P	1169.00	0.93
72 Ge	1425107.00	A	19870.00	1.39
75 As	156872.70	P	2027.00	1.29
77 Se	8993.67	P	103.60	1.15
79 Br	1220.00	P	124.90	10.24
82 Se	11889.80	P	83.34	0.70
88 Sr	1052804.00	A	16310.00	1.55
89 Y	1919995.00	A	14930.00	0.78
95 Mo	202330.00	P	3353.00	1.66
97 Mo	124870.00	P	680.20	0.54
98 Mo	322203.59	P	4978.00	1.55
107 Ag	217925.59	P	3056.00	1.40
109 Ag	209341.09	P	3368.00	1.61
111 Cd	131323.41	P	2531.00	1.93
114 Cd	293462.81	P	4241.00	1.45
115 In	1902497.00	A	34670.00	1.82
118 Sn	321676.59	P	3853.00	1.20
121 Sb	507081.00	P	8022.00	1.58
123 Sb	392305.31	P	5890.00	1.50
135 Ba	98356.67	P	873.60	0.89
137 Ba	174890.00	P	4731.00	2.71
139 La	1677839.00	A	21900.00	1.31
140 Ce	1631474.00	A	24640.00	1.51
199 Hg	2350.00	P	41.33	1.76
200 Hg	3179.00	P	95.29	3.00
202 Hg	4161.33	P	113.10	2.72
203 Tl	502456.69	P	6934.00	1.38
205 Tl	1242802.00	A	13470.00	1.08
206 Pb	404046.69	P	5377.00	1.33
207 Pb	367216.69	P	4458.00	1.21
208 Pb	1661590.00	P	28990.00	1.74
209 Bi	4074889.00	A	48230.00	1.18
232 Th	1762588.00	A	22020.00	1.25
238 U	1841236.00	A	27580.00	1.50

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1086335.90	1.23	1107761.60	98.1	60 - 125	
72 Ge	1425107.00	1.39	1463530.60	97.4	60 - 125	
89 Y	1919995.00	0.78	1932167.40	99.4	60 - 125	
115 In	1902496.80	1.82	1952569.30	97.4	60 - 125	
209 Bi	4074889.30	1.18	4087579.80	99.7	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00823

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\016CALS.D\016CALS.D#
Date Acquired: Feb 6 2018 03:11 pm
Operator: JPV
Sample Name: 100 ppb Br std
Misc Info: ICPMS-200.8-W-D
Vial Number: 4307
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:10 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	444.44	P	36.56	8.23
11 B	3525.55	P	117.10	3.32
27 Al	6713.33	P	155.00	2.31
45 Sc	1094116.00	A	12050.00	1.10
47 Ti	363.33	P	30.55	8.41
51 V	3614.66	P	59.14	1.64
52 Cr	15096.67	P	250.10	1.66
53 Cr	980.00	P	60.83	6.21
55 Mn	2810.00	P	10.00	0.36
57 Fe	32863.33	P	825.70	2.51
59 Co	2363.33	P	222.30	9.41
60 Ni	506.67	P	41.63	8.22
62 Ni	523.33	P	133.20	25.45
63 Cu	1653.33	P	102.60	6.21
65 Cu	760.00	P	95.39	12.55
66 Zn	509.75	P	0.05	0.01
72 Ge	1454617.00	A	20740.00	1.43
75 As	656.31	P	23.57	3.59
77 Se	165.00	P	2.65	1.60
79 Br	24716.67	P	351.30	1.42
82 Se	116.53	P	19.18	16.46
88 Sr	1636.67	P	290.20	17.73
89 Y	1950493.00	A	47690.00	2.45
95 Mo	1403.33	P	170.10	12.12
97 Mo	970.00	P	55.68	5.74
98 Mo	2255.06	P	90.07	3.99
107 Ag	4183.33	P	742.40	17.75
109 Ag	3962.22	P	799.40	20.18
111 Cd	1019.82	P	36.73	3.60
114 Cd	266.76	P	61.38	23.01
115 In	1938454.00	A	29260.00	1.51
118 Sn	4216.67	P	251.10	5.95
121 Sb	1197.00	P	37.99	3.17
123 Sb	938.33	P	21.55	2.30
135 Ba	200.00	P	26.46	13.23
137 Ba	246.67	P	89.63	36.34
139 La	1876.67	P	259.70	13.84
140 Ce	1836.67	P	302.40	16.47
199 Hg	99.00	P	17.44	17.62
200 Hg	139.33	P	16.04	11.51
202 Hg	159.67	P	16.92	10.60
203 Tl	1563.33	P	35.12	2.25
205 Tl	3413.33	P	119.30	3.50
206 Pb	893.33	P	40.41	4.52
207 Pb	713.33	P	15.28	2.14
208 Pb	3486.67	P	249.10	7.14
209 Bi	4235110.00	A	69260.00	1.64
232 Th	14514.44	P	280.70	1.93
238 U	3896.67	P	525.50	13.49

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1094115.60	1.10	1107761.60	98.8	60 - 125	
72 Ge	1454617.50	1.43	1463530.60	99.4	60 - 125	
89 Y	1950492.60	2.45	1932167.40	100.9	60 - 125	
115 In	1938454.40	1.51	1952569.30	99.3	60 - 125	
209 Bi	4235109.50	1.64	4087579.80	103.6	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00824

Calibration - C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C

=== Graph Summary ===
Page: 1/5

	(1) 9 Be	(1) 11 B	(1) 27 Al	(1) 45 Sc	(1) 47 Ti	(1) 51 V
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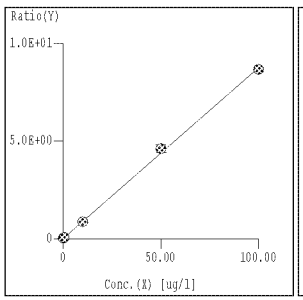
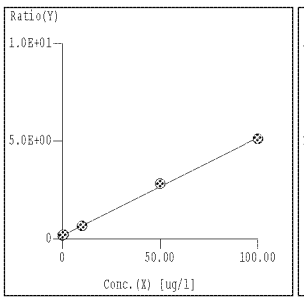
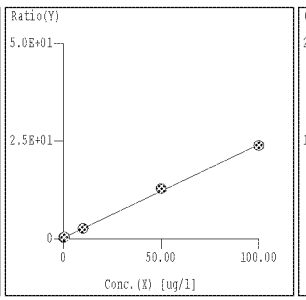
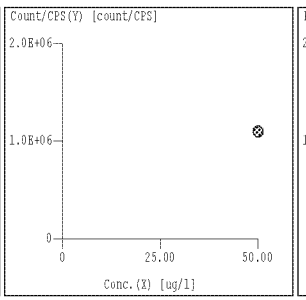
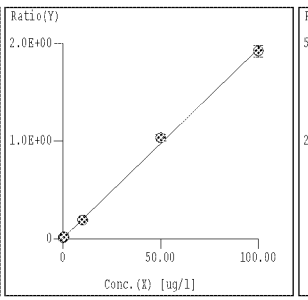
< DL >	7.014E-02 ug/l	1.672E-01 ug/l	9.366E-02 ug/l	--- ug/l	3.382E-01 ug/l	1.294E-01 ug/l
< BEC >	2.652E-01 ug/l	3.302 ug/l	1.211 ug/l	--- ug/l	3.980E-01 ug/l	4.145E-01 ug/l

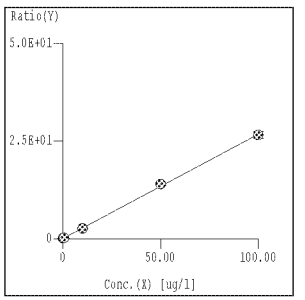




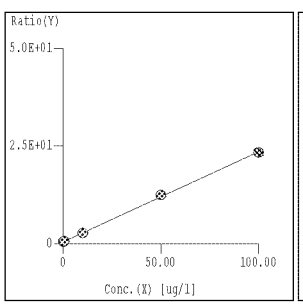


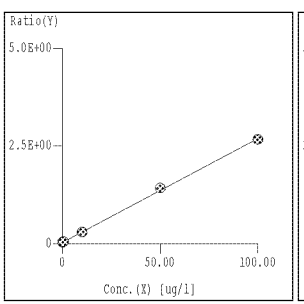


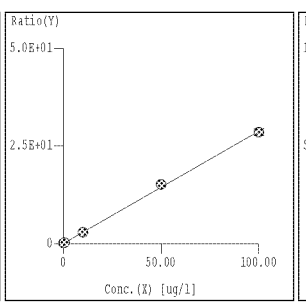


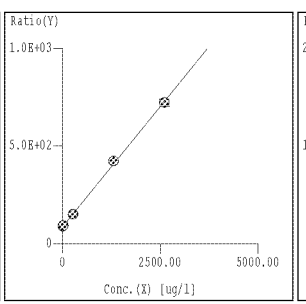


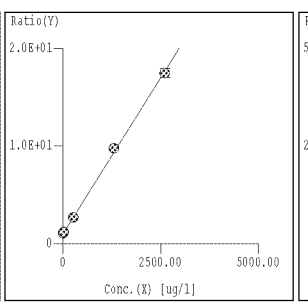
	(1) 52 Cr	(1) 53 Cr	(1) 55 Mn	(1) 56 Fe	(1) 57 Fe	(1) 59 Co
< r >	0.9997	0.9996	0.9996	0.9996	0.9996	0.9995
< DL >	7.545E-02 ug/l	2.743E-01 ug/l	4.139E-02 ug/l	5.865 ug/l	4.071 ug/l	7.537E-02 ug/l
< BEC >	2.070 ug/l	1.242 ug/l	3.371E-01 ug/l	361.0 ug/l	165.9 ug/l	3.095E-01 ug/l

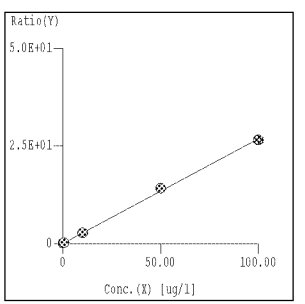








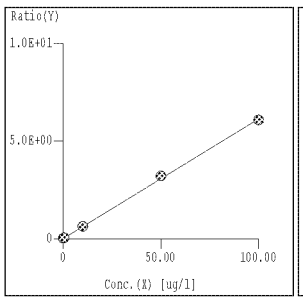


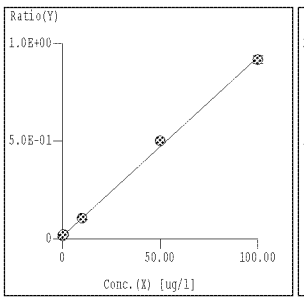


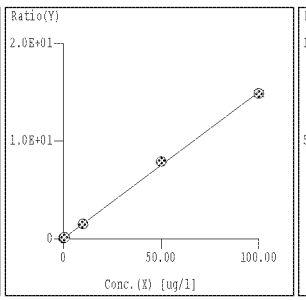
ED_004985_00011411-00825

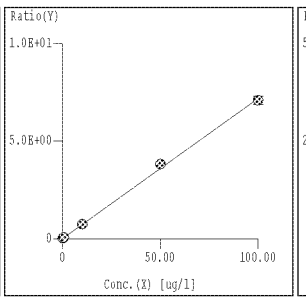
=== Graph Summary ===
Page: 2/5

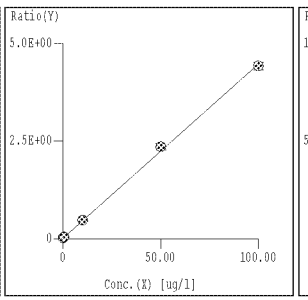
	(1) 60 Ni	(1) 62 Ni	(1) 63 Cu	(1) 65 Cu	(1) 66 Zn	(1) 67 Zn
< r >	0.9996	0.9993	0.9996	0.9993	0.9996	0.0000
< DL >	8.050E-02 ug/l	8.214E-01 ug/l	2.037E-01 ug/l	6.144E-02 ug/l	1.317E-01 ug/l	--- ug/l
< BEC >	2.748E-01 ug/l	1.593 ug/l	3.603E-01 ug/l	3.334E-01 ug/l	4.261E-01 ug/l	--- ug/l

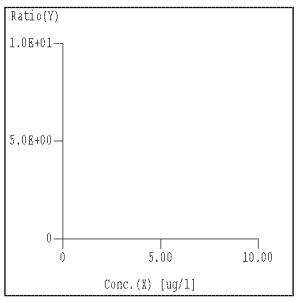




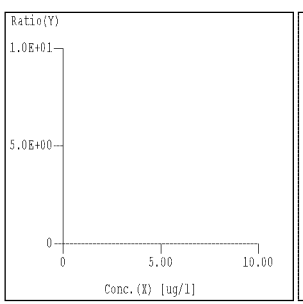


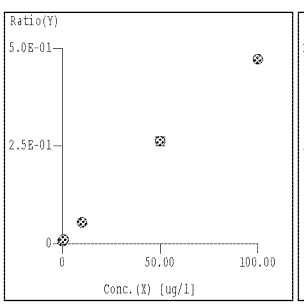


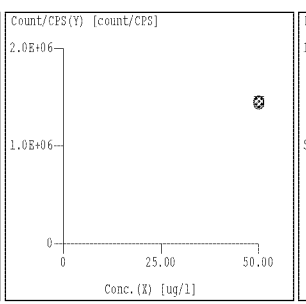


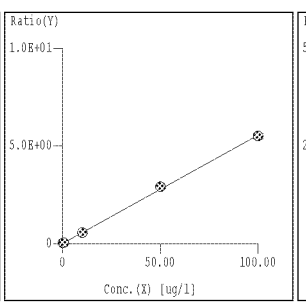


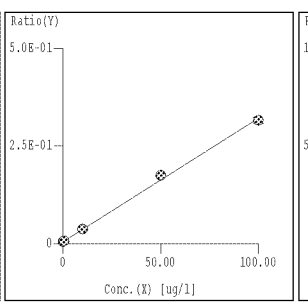
	(1) 68 Zn	(1) 69	(1) 72 Ge	(1) 75 As	(1) 77 Se	(1) 79 Br
< r >	0.0000	0.9988	0.0000	0.9996	0.9990	1.0000
< DL >	--- ug/l	--- ug/l	--- ug/l	9.773E-02 ug/l	3.922E-01 ug/l	3.891E-01 ug/l
< BEC >	--- ug/l	--- ug/l	--- ug/l	3.263E-01 ug/l	1.618 ug/l	2.883 ug/l

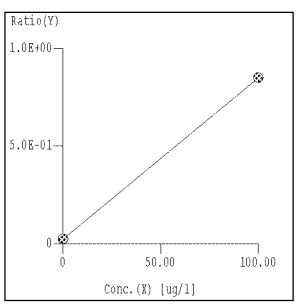








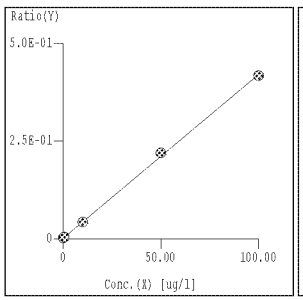


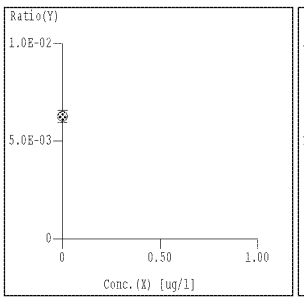


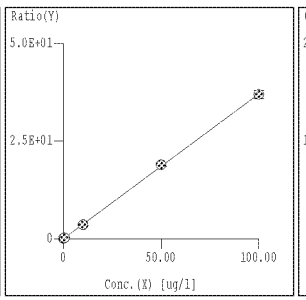
ED_004985_00011411-00826

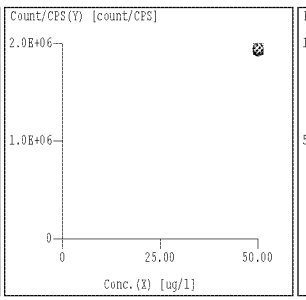
=== Graph Summary ===
Page: 3/5

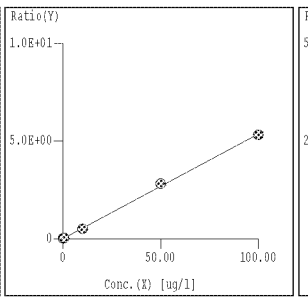
	(1) 82 Se	(1) 83 Kr	(1) 88 Sr	(1) 89 Y	(1) 95 Mo	(1) 97 Mo
< r >	0.9997	0.0000	0.9999	0.0000	0.9996	0.9995
< DL >	5.249E-01 ug/l	--- ug/l	3.382E-02 ug/l	--- ug/l	1.250E-01 ug/l	2.633E-01 ug/l
< BEC >	4.220E-01 ug/l	--- ug/l	1.539E-01 ug/l	--- ug/l	2.660E-01 ug/l	3.097E-01 ug/l

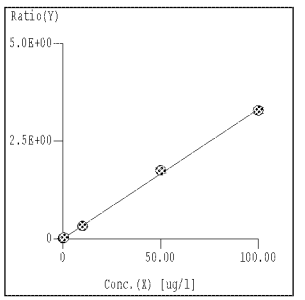




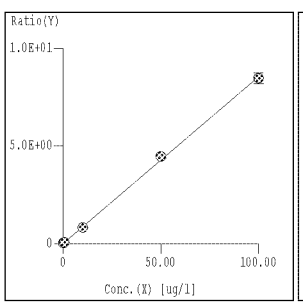


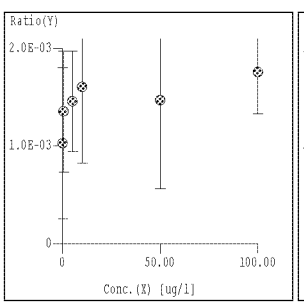


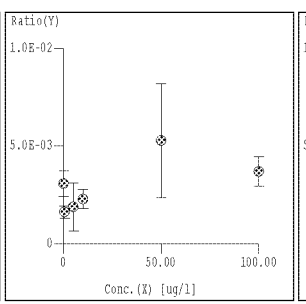


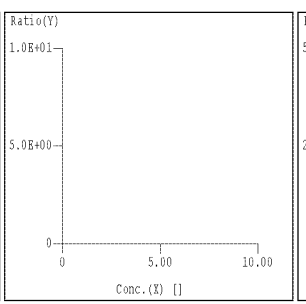


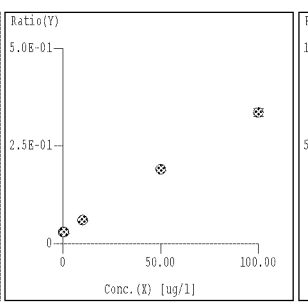
	(1) 98 Mo	(1) 99 Ru	(1) 102	(1) 103 Rh	(1) 106 (Cd)	(1) 107 Ag
< r >	0.9996	0.6851	0.6353	0.0000	0.9997	0.9998
< DL >	9.225E-02 ug/l	--- ug/l	--- ug/l	---	--- ug/l	3.144E-02 ug/l
< BEC >	2.685E-01 ug/l	--- ug/l	--- ug/l	---	--- ug/l	1.284E-01 ug/l

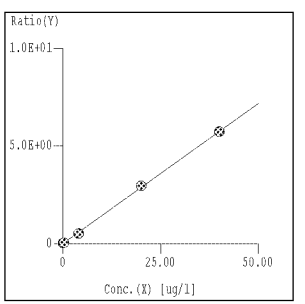






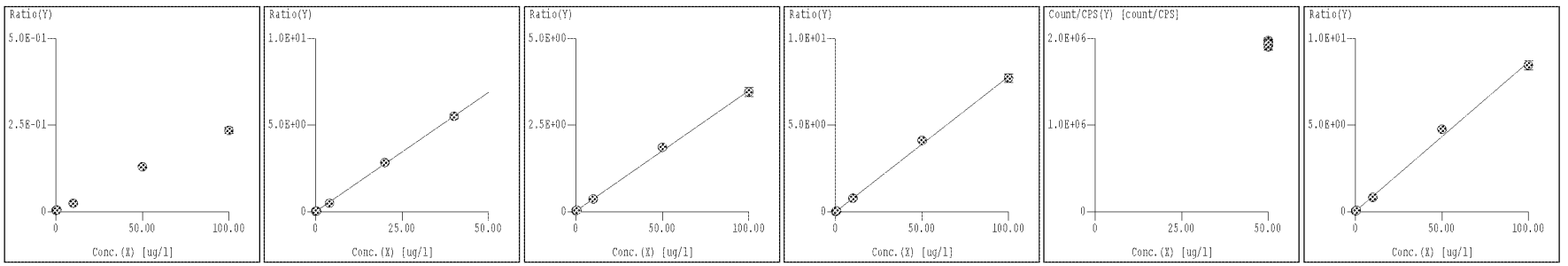




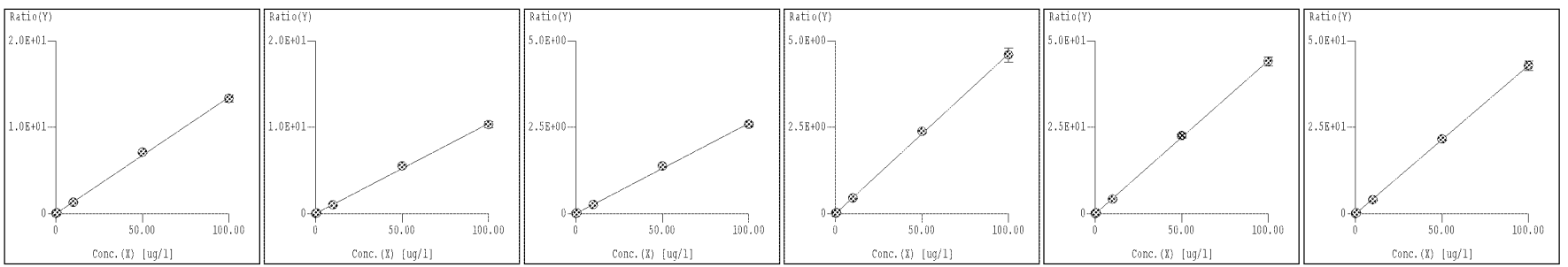


=== Graph Summary ===
Page: 4/5

	(1) 108 (Cd)	(1) 109 Ag	(1) 111 Cd	(1) 114 Cd	(1) 115 In	(1) 118 Sn
< r >	0.9988	0.9998	0.9994	0.9995	0.0000	0.9981
< DL >	--- ug/l	3.706E-02 ug/l	9.313E-02 ug/l	8.071E-02 ug/l	--- ug/l	6.625E-02 ug/l
< BEC >	--- ug/l	1.167E-01 ug/l	6.986E-01 ug/l	6.972E-02 ug/l	--- ug/l	4.849E-01 ug/l



	(1) 121 Sb	(1) 123 Sb	(1) 135 Ba	(1) 137 Ba	(1) 139 La	(1) 140 Ce
< r >	0.9994	0.9994	0.9995	0.9998	0.9999	1.0000
< DL >	2.068E-02 ug/l	4.548E-03 ug/l	8.726E-02 ug/l	1.002E-01 ug/l	2.802E-03 ug/l	8.555E-03 ug/l
< BEC >	1.773E-01 ug/l	1.756E-01 ug/l	1.697E-01 ug/l	1.551E-01 ug/l	2.622E-02 ug/l	2.884E-02 ug/l



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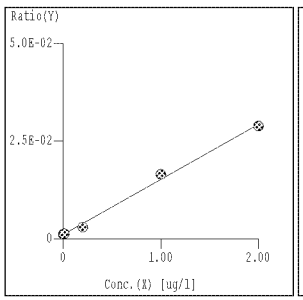
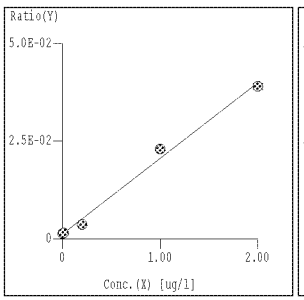
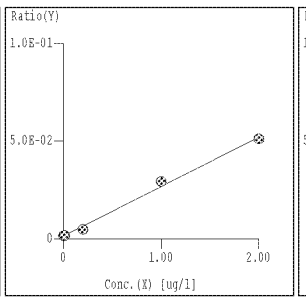
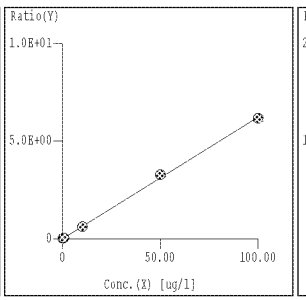
=== Graph Summary ===
Page: 5/5

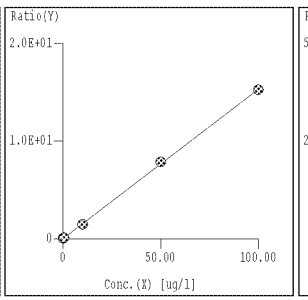
	(1) 199 Hg	(1) 200 Hg	(1) 202 Hg	(1) 203 Tl	(1) 205 Tl	(1) 206 Pb
< r >	0.9977	0.9962	0.9973	0.9995	0.9999	0.9997
< DL >	2.810E-02 ug/l	2.227E-02 ug/l	3.175E-03 ug/l	2.859E-02 ug/l	5.843E-02 ug/l	1.475E-02 ug/l
< BEC >	7.897E-02 ug/l	6.562E-02 ug/l	5.679E-02 ug/l	2.325E-01 ug/l	1.908E-01 ug/l	1.870E-01 ug/l

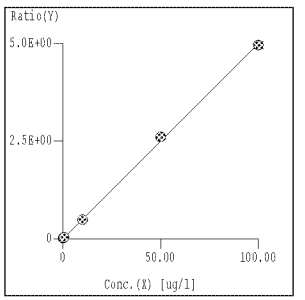




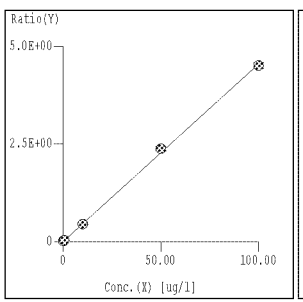


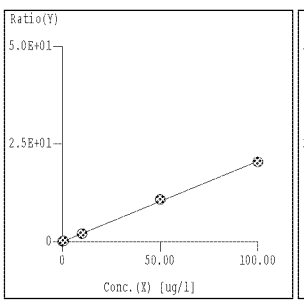


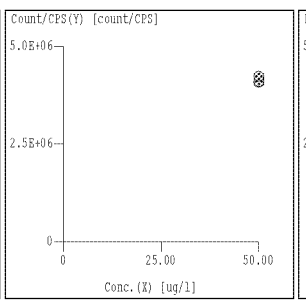


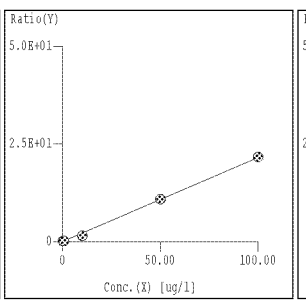


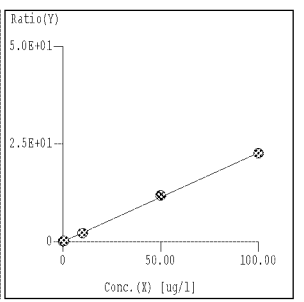
	(1) 207 Pb	(1) 208 Pb	(1) 209 Bi	(1) 232 Th	(1) 238 U
< r >	0.9996	0.9996	0.0000	0.9994	0.9997
< DL >	6.898E-02 ug/l	3.222E-02 ug/l	--- ug/l	6.253E-02 ug/l	1.584E-02 ug/l
< BEC >	2.103E-01 ug/l	1.854E-01 ug/l	--- ug/l	3.806E-01 ug/l	1.861E-01 ug/l











ICV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\017ICV.D\017ICV.D#
Date Acquired: Feb 6 2018 03:14 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: **QCS**
Misc Info: ICPMS-200.8-W-D
Vial Number: 4101
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: ICV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range(%)	Flag
9 Be	25.820	ug/l	1.44	25.00	90 - 110	
11 B	51.350	ug/l	0.87	50.00	90 - 110	
27 Al	259.900	ug/l	3.14	250.00	90 - 110	
47 Ti	46.760	ug/l	3.20	50.00	90 - 110	
51 V	49.130	ug/l	1.66	50.00	90 - 110	
52 Cr	49.870	ug/l	3.28	50.00	90 - 110	
53 Cr	51.620	ug/l	3.94	50.00	90 - 110	
55 Mn	251.700	ug/l	2.26	250.00	90 - 110	
57 Fe	250.700	ug/l	3.81	250.00	90 - 110	
59 Co	50.490	ug/l	1.84	50.00	90 - 110	
60 Ni	50.650	ug/l	1.44	50.00	90 - 110	
62 Ni	51.930	ug/l	3.89	50.00	90 - 110	
63 Cu	51.250	ug/l	0.70	50.00	90 - 110	
65 Cu	52.290	ug/l	1.52	50.00	90 - 110	
66 Zn	52.270	ug/l	1.68	50.00	90 - 110	
75 As	49.700	ug/l	1.35	50.00	90 - 110	
77 Se	51.180	ug/l	0.55	50.00	90 - 110	
79 Br	3.012	ug/l	29.26	---	##### - #####	
82 Se	50.080	ug/l	1.46	50.00	90 - 110	
88 Sr	48.910	ug/l	1.67	50.00	90 - 110	
95 Mo	47.800	ug/l	2.59	50.00	90 - 110	
97 Mo	47.810	ug/l	3.51	50.00	90 - 110	
98 Mo	47.760	ug/l	2.82	50.00	90 - 110	
107 Ag	26.440	ug/l	1.37	25.00	90 - 110	
109 Ag	26.480	ug/l	2.64	25.00	90 - 110	
111 Cd	25.090	ug/l	2.02	25.00	90 - 110	
114 Cd	25.000	ug/l	2.28	25.00	90 - 110	
118 Sn	48.980	ug/l	2.95	50.00	90 - 110	
121 Sb	49.330	ug/l	2.29	50.00	90 - 110	
123 Sb	49.360	ug/l	2.27	50.00	90 - 110	
135 Ba	49.170	ug/l	3.85	50.00	90 - 110	
137 Ba	48.800	ug/l	1.15	50.00	90 - 110	
139 La	50.870	ug/l	3.17	50.00	90 - 110	
140 Ce	49.260	ug/l	1.26	50.00	90 - 110	
199 Hg	2.060	ug/l	1.97	2.00	90 - 110	
200 Hg	2.070	ug/l	0.55	2.00	90 - 110	
202 Hg	2.047	ug/l	0.74	2.00	90 - 110	
203 Tl	50.280	ug/l	1.71	50.00	90 - 110	
205 Tl	49.410	ug/l	1.56	50.00	90 - 110	
206 Pb	50.820	ug/l	1.93	50.00	90 - 110	
207 Pb	50.560	ug/l	1.50	50.00	90 - 110	
208 Pb	50.710	ug/l	1.36	50.00	90 - 110	
232 Th	21.480	ug/l	1.00	20.00	90 - 110	
238 U	19.930	ug/l	0.64	20.00	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1091785.60	1.04	1107761.60	98.6	60 - 125	
72 Ge	1471698.60	2.05	1463530.60	100.6	60 - 125	
89 Y	1953604.40	0.50	1932167.40	101.1	60 - 125	
115 In	1986902.40	2.42	1952569.30	101.8	60 - 125	
209 Bi	4253034.00	0.96	4087579.80	104.0	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00830

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\018CCV.D\018CCV.D#
Date Acquired: Feb 6 2018 03:16 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	52.630	ug/l	2.71	50.00	85 - 115	90 - 110	
11 B	52.480	ug/l	2.77	50.00	85 - 115	90 - 110	
27 Al	51.800	ug/l	3.48	50.00	85 - 115	90 - 110	
47 Ti	51.000	ug/l	5.45	50.00	85 - 115	90 - 110	
51 V	51.720	ug/l	4.04	50.00	85 - 115	90 - 110	
52 Cr	52.080	ug/l	4.23	50.00	85 - 115	90 - 110	
53 Cr	52.230	ug/l	3.53	50.00	85 - 115	90 - 110	
55 Mn	52.130	ug/l	3.91	50.00	85 - 115	90 - 110	
57 Fe	1357.000	ug/l	3.25	1300.00	85 - 115	90 - 110	
59 Co	52.150	ug/l	2.35	50.00	85 - 115	90 - 110	
60 Ni	51.840	ug/l	2.48	50.00	85 - 115	90 - 110	
62 Ni	53.670	ug/l	1.44	50.00	85 - 115	90 - 110	
63 Cu	52.350	ug/l	2.21	50.00	85 - 115	90 - 110	
65 Cu	52.180	ug/l	2.84	50.00	85 - 115	90 - 110	
66 Zn	51.930	ug/l	0.90	50.00	85 - 115	90 - 110	
75 As	51.990	ug/l	2.15	50.00	85 - 115	90 - 110	
77 Se	52.650	ug/l	4.37	50.00	85 - 115	90 - 110	
79 Br	2.358	ug/l	65.35	---	#### - ####	#### - ####	
82 Se	52.370	ug/l	2.83	50.00	85 - 115	90 - 110	
88 Sr	51.350	ug/l	2.96	50.00	85 - 115	90 - 110	
95 Mo	52.700	ug/l	3.90	50.00	85 - 115	90 - 110	
97 Mo	52.020	ug/l	2.80	50.00	85 - 115	90 - 110	
98 Mo	52.400	ug/l	3.61	50.00	85 - 115	90 - 110	
107 Ag	20.610	ug/l	1.19	20.00	85 - 115	90 - 110	
109 Ag	20.430	ug/l	1.68	20.00	85 - 115	90 - 110	
111 Cd	52.060	ug/l	3.87	50.00	85 - 115	90 - 110	
114 Cd	52.460	ug/l	2.68	50.00	85 - 115	90 - 110	
118 Sn	53.810	ug/l	3.95	50.00	85 - 115	90 - 110	
121 Sb	52.380	ug/l	3.26	50.00	85 - 115	90 - 110	
123 Sb	52.370	ug/l	3.68	50.00	85 - 115	90 - 110	
135 Ba	51.610	ug/l	3.81	50.00	85 - 115	90 - 110	
137 Ba	51.880	ug/l	3.36	50.00	85 - 115	90 - 110	
139 La	51.300	ug/l	2.87	50.00	85 - 115	90 - 110	
140 Ce	50.270	ug/l	4.19	50.00	85 - 115	90 - 110	
199 Hg	1.118	ug/l	2.14	1.00	85 - 115	90 - 110	>10%
200 Hg	1.118	ug/l	4.32	1.00	85 - 115	90 - 110	>10%
202 Hg	1.083	ug/l	2.20	1.00	85 - 115	90 - 110	
203 Tl	52.240	ug/l	2.27	50.00	85 - 115	90 - 110	
205 Tl	50.630	ug/l	2.67	50.00	85 - 115	90 - 110	
206 Pb	52.180	ug/l	2.49	50.00	85 - 115	90 - 110	
207 Pb	52.310	ug/l	4.01	50.00	85 - 115	90 - 110	
208 Pb	52.140	ug/l	3.19	50.00	85 - 115	90 - 110	
232 Th	49.580	ug/l	2.33	50.00	85 - 115	90 - 110	
238 U	51.690	ug/l	3.17	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1095112.80	1.35	1107761.60	98.9	60 - 125	
72 Ge	1449972.10	2.15	1463530.60	99.1	60 - 125	
89 Y	1902947.50	0.62	1932167.40	98.5	60 - 125	
115 In	1937763.10	2.06	1952569.30	99.2	60 - 125	
209 Bi	4199146.50	1.27	4087579.80	102.7	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

QC Range 1
0 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
2 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00831

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\019SMPL.D\019SMPL.D#
Date Acquired: Feb 6 2018 03:19 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.015	-0.015	ug/l	98.25	4500.00	480.00		P
11 B	-0.384	-0.384	ug/l	15.94	4500.00	3206.67		P
27 Al	0.162	0.162	ug/l	48.89	4500.00	7170.00		P
47 Ti	0.015	0.015	ug/l	292.05	4500.00	233.33		P
51 V	0.027	0.027	ug/l	174.19	4500.00	3423.67		P
52 Cr	0.054	0.054	ug/l	293.54	4500.00	14250.00		P
53 Cr	0.046	0.046	ug/l	191.57	4500.00	996.67		P
55 Mn	0.091	0.091	ug/l	30.10	4500.00	3583.33		P
57 Fe	10.380	10.380	ug/l	24.05	4500.00	32783.33		P
59 Co	0.013	0.013	ug/l	183.05	4500.00	2516.67		P
60 Ni	0.057	0.057	ug/l	115.31	4500.00	590.00		P
62 Ni	-0.119	-0.119	ug/l	160.32	4500.00	393.33		P
63 Cu	-0.005	-0.005	ug/l	572.62	4500.00	1553.33		P
65 Cu	0.025	0.025	ug/l	138.63	4500.00	750.00		P
66 Zn	0.003	0.003	ug/l	1743.80	4500.00	556.44		P
75 As	0.076	0.076	ug/l	30.95	4500.00	649.06		P
77 Se	0.195	0.195	ug/l	16.42	4500.00	167.00		P
79 Br	0.094	0.094	ug/l	---	#VALUE!	716.67		P
82 Se	0.171	0.171	ug/l	85.20	4500.00	72.53		P
88 Sr	0.051	0.051	ug/l	21.57	4500.00	2213.33		P
95 Mo	0.282	0.282	ug/l	4.24	4500.00	1153.33		P
97 Mo	0.281	0.281	ug/l	18.13	4500.00	766.67		P
98 Mo	0.284	0.284	ug/l	10.69	4500.00	1848.47		P
107 Ag	0.266	0.266	ug/l	11.78	1800.00	2217.78		P
109 Ag	0.254	0.254	ug/l	16.05	1800.00	2002.22		P
111 Cd	0.093	0.093	ug/l	54.89	4500.00	1080.89		P
114 Cd	0.040	0.040	ug/l	29.62	4500.00	336.91		P
118 Sn	0.570	0.570	ug/l	18.50	4500.00	3566.67		P
121 Sb	0.019	0.019	ug/l	54.10	4500.00	1035.33		P
123 Sb	0.019	0.019	ug/l	80.77	4500.00	795.67		P
135 Ba	0.045	0.045	ug/l	60.35	4500.00	220.00		P
137 Ba	0.024	0.024	ug/l	227.12	4500.00	323.33		P
139 La	0.066	0.066	ug/l	21.31	4500.00	1606.67		P
140 Ce	0.057	0.057	ug/l	21.98	4500.00	1446.67		P
199 Hg	0.036	0.036	ug/l	37.06	450.00	141.00		P
200 Hg	0.039	0.039	ug/l	39.41	450.00	175.00		P
202 Hg	0.032	0.032	ug/l	23.81	450.00	193.67		P
203 Tl	0.045	0.045	ug/l	19.26	4500.00	1496.67		P
205 Tl	0.060	0.060	ug/l	27.27	4500.00	3323.33		P
206 Pb	0.054	0.054	ug/l	58.60	4500.00	1043.33		P
207 Pb	0.044	0.044	ug/l	129.53	4500.00	996.67		P
208 Pb	0.048	0.048	ug/l	42.73	4500.00	4160.00		P
232 Th	0.346	0.346	ug/l	4.33	4500.00	13511.11		P
238 U	0.033	0.033	ug/l	54.69	4500.00	4313.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1095515.90	0.91	1107761.60	98.9	60.000002	-	125
72 Ge	1456102.40	1.85	1463530.60	99.5	60.000002	-	125
89 Y	1956853.60	1.71	1932167.40	101.3	60.000002	-	125
115 In	1962211.90	2.80	1952569.30	100.5	60.000002	-	125
209 Bi	4331293.50	1.88	4087579.80	106.0	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00832

CCB QC Report **ICPMS202-B**

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\020_CCB.D\020_CCB.D#
Date Acquired: Feb 6 2018 03:22 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:13 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	-0.099	ug/l	14.72	0.09	
11 B	-0.309	ug/l	43.37	1.18	
27 Al	-0.092	ug/l	23.89	0.38	
47 Ti	-0.011	ug/l	673.87	0.17	
51 V	-0.075	ug/l	36.68	0.09	
52 Cr	-0.068	ug/l	183.96	0.12	
53 Cr	-0.058	ug/l	251.86	0.13	
55 Mn	-0.034	ug/l	21.25	0.14	
57 Fe	6.104	ug/l	76.20	4.00	Fail
59 Co	-0.079	ug/l	25.29	0.04	
60 Ni	-0.078	ug/l	65.99	0.08	
62 Ni	-0.254	ug/l	56.10	0.32	
63 Cu	-0.092	ug/l	41.92	0.09	
65 Cu	-0.055	ug/l	66.56	0.22	
66 Zn	-0.138	ug/l	37.04	0.10	
75 As	-0.078	ug/l	27.84	0.12	
77 Se	-0.021	ug/l	464.90	1.22	
79 Br	-0.225	ug/l	339.00	#VALUE!	
82 Se	0.030	ug/l	354.84	0.32	
88 Sr	-0.059	ug/l	22.32	0.05	
95 Mo	0.025	ug/l	45.95	0.05	
97 Mo	-0.028	ug/l	208.65	0.03	
98 Mo	0.015	ug/l	34.37	0.03	
107 Ag	0.055	ug/l	34.25	0.09	
109 Ag	0.050	ug/l	31.34	0.10	
111 Cd	-0.051	ug/l	131.05	0.03	
114 Cd	-0.036	ug/l	31.23	0.03	
118 Sn	0.116	ug/l	34.49	0.05	Fail
121 Sb	-0.058	ug/l	8.64	0.03	
123 Sb	-0.056	ug/l	13.14	0.04	
135 Ba	-0.017	ug/l	249.82	0.09	
137 Ba	-0.067	ug/l	1.82	0.08	
139 La	0.022	ug/l	19.77	0.02	Fail
140 Ce	0.023	ug/l	36.28	0.02	Fail
199 Hg	-0.001	ug/l	590.36	0.03	
200 Hg	0.004	ug/l	299.83	0.03	
202 Hg	0.007	ug/l	87.26	0.03	
203 Tl	-0.081	ug/l	13.71	0.03	
205 Tl	-0.052	ug/l	17.17	0.02	
206 Pb	-0.061	ug/l	50.66	#VALUE!	
207 Pb	-0.084	ug/l	8.54	#VALUE!	
208 Pb	-0.070	ug/l	19.72	0.02	
232 Th	0.038	ug/l	44.13	0.06	
238 U	-0.075	ug/l	11.81	0.02	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1096029.30	0.96	1107761.60	98.9	60 - 125	
72 Ge	1469605.10	3.25	1463530.60	100.4	60 - 125	
89 Y	1950013.00	2.34	1932167.40	100.9	60 - 125	
115 In	1963549.50	1.37	1952569.30	100.6	60 - 125	
209 Bi	4338190.00	1.37	4087579.80	106.1	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

4 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00833

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\021SMPL.D\021SMPL.D#
Date Acquired: Feb 6 2018 03:24 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: LRB
Misc Info: ICPMS-200.8-W-D
Vial Number: 3101
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.114	-0.114	ug/l	15.41	4500.00	286.67		P
11 B	-0.786	-0.786	ug/l	11.29	4500.00	2738.89		P
27 Al	-0.156	-0.156	ug/l	21.37	4500.00	5456.67		P
47 Ti	0.019	0.019	ug/l	488.35	4500.00	236.67		P
51 V	-0.091	-0.091	ug/l	31.60	4500.00	2521.06		P
52 Cr	-0.117	-0.117	ug/l	85.17	4500.00	13143.33		P
53 Cr	-0.039	-0.039	ug/l	357.29	4500.00	933.33		P
55 Mn	-0.034	-0.034	ug/l	21.60	4500.00	2540.00		P
57 Fe	2.079	2.079	ug/l	130.35	4500.00	31323.33		P
59 Co	-0.088	-0.088	ug/l	20.88	4500.00	1730.00		P
60 Ni	-0.053	-0.053	ug/l	74.47	4500.00	396.67		P
62 Ni	-0.285	-0.285	ug/l	32.69	4500.00	350.00		P
63 Cu	-0.102	-0.102	ug/l	4.70	4500.00	1130.00		P
65 Cu	-0.080	-0.080	ug/l	57.87	4500.00	530.00		P
66 Zn	0.778	0.778	ug/l	25.09	4500.00	1569.80		P
75 As	-0.088	-0.088	ug/l	26.33	4500.00	386.01		P
77 Se	0.004	0.004	ug/l	2541.10	4500.00	149.67		P
79 Br	1.197	1.197	ug/l	---	#VALUE!	983.33		P
82 Se	0.058	0.058	ug/l	116.78	4500.00	58.87		P
88 Sr	-0.058	-0.058	ug/l	10.36	4500.00	1036.67		P
95 Mo	-0.029	-0.029	ug/l	161.33	4500.00	500.00		P
97 Mo	-0.082	-0.082	ug/l	9.28	4500.00	296.67		P
98 Mo	-0.083	-0.083	ug/l	32.83	4500.00	621.31		P
107 Ag	-0.026	-0.026	ug/l	75.44	1800.00	578.89		P
109 Ag	-0.021	-0.021	ug/l	25.31	1800.00	518.89		P
111 Cd	-0.049	-0.049	ug/l	93.58	4500.00	887.91		P
114 Cd	-0.049	-0.049	ug/l	44.76	4500.00	63.08		P
118 Sn	-0.016	-0.016	ug/l	374.65	4500.00	1590.00		P
121 Sb	-0.082	-0.082	ug/l	3.19	4500.00	502.67		P
123 Sb	-0.076	-0.076	ug/l	9.80	4500.00	407.00		P
135 Ba	-0.085	-0.085	ug/l	6.98	4500.00	86.67		P
137 Ba	-0.063	-0.063	ug/l	28.95	4500.00	166.67		P
139 La	0.006	0.006	ug/l	63.57	4500.00	566.67		P
140 Ce	0.009	0.009	ug/l	88.63	4500.00	630.00		P
199 Hg	0.009	0.009	ug/l	108.62	450.00	107.00		P
200 Hg	0.005	0.005	ug/l	105.69	450.00	118.00		P
202 Hg	0.005	0.005	ug/l	198.52	450.00	136.33		P
203 Tl	-0.013	-0.013	ug/l	129.82	4500.00	1180.00		P
205 Tl	0.012	0.012	ug/l	155.74	4500.00	2686.67		P
206 Pb	-0.039	-0.039	ug/l	47.50	4500.00	640.00		P
207 Pb	-0.055	-0.055	ug/l	20.92	4500.00	610.00		P
208 Pb	-0.050	-0.050	ug/l	3.04	4500.00	2406.67		P
232 Th	-0.093	-0.093	ug/l	14.29	4500.00	5335.56		P
238 U	-0.092	-0.092	ug/l	6.47	4500.00	1856.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1085532.30	2.04	1107761.60	98.0	60.000002	-	125
72 Ge	1459885.00	1.40	1463530.60	99.8	60.000002	-	125
89 Y	1933270.80	0.97	1932167.40	100.1	60.000002	-	125
115 In	1966398.80	0.99	1952569.30	100.7	60.000002	-	125
209 Bi	4325517.00	0.10	4087579.80	105.8	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00834

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\022SMPL.D\022SMPL.D#
Date Acquired: Feb 6 2018 03:27 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: LLRV
Misc Info: ICPMS-200.8-W-D
Vial Number: 4102
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.365	0.365	ug/l	17.64	4500.00	1201.11		P
11 B	0.914	0.914	ug/l	12.03	4500.00	4613.33		P
27 Al	10.170	10.170	ug/l	1.93	4500.00	59236.66		P
47 Ti	0.940	0.940	ug/l	10.26	4500.00	760.00		P
51 V	1.849	1.849	ug/l	1.93	4500.00	17698.38		P
52 Cr	0.857	0.857	ug/l	18.03	4500.00	19760.00		P
53 Cr	0.783	0.783	ug/l	22.96	4500.00	1576.67		P
55 Mn	0.447	0.447	ug/l	7.55	4500.00	6603.33		P
57 Fe	8.297	8.297	ug/l	80.58	4500.00	32586.67		P
59 Co	0.100	0.100	ug/l	36.78	4500.00	3210.00		P
60 Ni	2.058	2.058	ug/l	3.36	4500.00	4186.67		P
62 Ni	1.715	1.715	ug/l	25.66	4500.00	886.67		P
63 Cu	1.885	1.885	ug/l	4.78	4500.00	9856.67		P
65 Cu	1.944	1.944	ug/l	1.40	4500.00	4783.33		P
66 Zn	4.978	4.978	ug/l	2.54	4500.00	7063.10		P
75 As	0.896	0.896	ug/l	3.92	4500.00	1985.72		P
77 Se	1.928	1.928	ug/l	16.80	4500.00	328.33		P
79 Br	-0.263	-0.263	ug/l	---	#VALUE!	633.33		P
82 Se	1.960	1.960	ug/l	0.44	4500.00	292.73		P
88 Sr	0.405	0.405	ug/l	5.23	4500.00	6060.00		P
95 Mo	0.360	0.360	ug/l	1.75	4500.00	1340.00		P
97 Mo	0.396	0.396	ug/l	9.01	4500.00	933.33		P
98 Mo	0.339	0.339	ug/l	5.68	4500.00	2070.83		P
107 Ag	0.063	0.063	ug/l	4.32	1800.00	1097.78		P
109 Ag	0.065	0.065	ug/l	17.48	1800.00	1000.00		P
111 Cd	0.132	0.132	ug/l	40.48	4500.00	1151.66		P
114 Cd	0.130	0.130	ug/l	26.98	4500.00	620.37		P
118 Sn	0.823	0.823	ug/l	3.50	4500.00	4493.33		P
121 Sb	0.291	0.291	ug/l	8.97	4500.00	2517.33		P
123 Sb	0.292	0.292	ug/l	10.13	4500.00	1945.33		P
135 Ba	0.275	0.275	ug/l	16.76	4500.00	463.33		P
137 Ba	0.215	0.215	ug/l	22.74	4500.00	683.33		P
139 La	0.199	0.199	ug/l	6.71	4500.00	3986.67		P
140 Ce	0.198	0.198	ug/l	7.70	4500.00	3880.00		P
199 Hg	1.383	1.383	ug/l	16.62	450.00	1807.33		P
200 Hg	1.363	1.363	ug/l	11.59	450.00	2423.00		P
202 Hg	1.357	1.357	ug/l	15.99	450.00	3138.00		P
203 Tl	0.428	0.428	ug/l	6.99	4500.00	3600.00		P
205 Tl	0.462	0.462	ug/l	3.79	4500.00	8750.00		P
206 Pb	0.389	0.389	ug/l	2.12	4500.00	2520.00		P
207 Pb	0.367	0.367	ug/l	8.14	4500.00	2296.67		P
208 Pb	0.399	0.399	ug/l	3.76	4500.00	10526.67		P
232 Th	5.852	5.852	ug/l	8.47	4500.00	117297.80		P
238 U	0.389	0.389	ug/l	2.61	4500.00	11450.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1090799.40	1.40	1107761.60	98.5	60.000002	-	125
72 Ge	1465432.40	2.58	1463530.60	100.1	60.000002	-	125
89 Y	1977538.10	1.93	1932167.40	102.3	60.000002	-	125
115 In	1996544.30	2.92	1952569.30	102.3	60.000002	-	125
209 Bi	4381028.50	1.17	4087579.80	107.2	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00835

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\023SMPL.D\023SMPL.D#
Date Acquired: Feb 6 2018 03:30 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: LFB
Misc Info: ICPMS-200.8-W-D
Vial Number: 3102
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.02
Autodil Factor: Undiluted
Final Dil Factor: 1.02

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	51.153	50.150	ug/l	1.70	4500.00	95144.44		P
11 B	48.766	47.810	ug/l	2.03	4500.00	55302.22		P
27 Al	50.959	49.960	ug/l	1.92	4500.00	263296.69		P
47 Ti	57.559	56.430	ug/l	4.13	4500.00	31120.00		P
51 V	52.173	51.150	ug/l	3.01	4500.00	388362.00		P
52 Cr	51.275	50.270	ug/l	2.67	4500.00	340540.00		P
53 Cr	52.153	51.130	ug/l	2.62	4500.00	39306.67		P
55 Mn	51.592	50.580	ug/l	3.08	4500.00	412816.69		P
57 Fe	5,182.620	5081.000	ug/l	2.27	4500.00	945468.31		A
59 Co	51.173	50.170	ug/l	1.98	4500.00	381583.31		P
60 Ni	50.878	49.880	ug/l	2.42	4500.00	86730.00		P
62 Ni	51.377	50.370	ug/l	5.20	4500.00	13430.00		P
63 Cu	51.184	50.180	ug/l	0.80	4500.00	213780.00		P
65 Cu	50.980	49.980	ug/l	1.87	4500.00	101780.00		P
66 Zn	50.663	49.670	ug/l	2.20	4500.00	63020.28		P
75 As	51.653	50.640	ug/l	2.22	4500.00	79724.44		P
77 Se	54.162	53.100	ug/l	2.51	4500.00	4882.33		P
79 Br	6.050	5.931	ug/l	---	#VALUE!	2053.33		P
82 Se	50.296	49.310	ug/l	2.58	4500.00	5883.60		P
88 Sr	51.490	50.480	ug/l	2.64	4500.00	529326.69		P
95 Mo	52.010	50.990	ug/l	2.39	4500.00	103696.70		P
97 Mo	52.040	51.020	ug/l	2.15	4500.00	64166.66		P
98 Mo	51.745	50.730	ug/l	3.48	4500.00	164215.09		P
107 Ag	19.788	19.400	ug/l	1.70	1800.00	105700.00		P
109 Ag	19.594	19.210	ug/l	1.47	1800.00	100511.10		P
111 Cd	50.837	49.840	ug/l	2.32	4500.00	66299.61		P
114 Cd	50.765	49.770	ug/l	2.88	4500.00	146894.30		P
118 Sn	51.163	50.160	ug/l	2.69	4500.00	164603.30		P
121 Sb	50.113	49.130	ug/l	2.75	4500.00	250833.70		P
123 Sb	50.062	49.080	ug/l	3.40	4500.00	193960.70		P
135 Ba	51.683	50.670	ug/l	3.26	4500.00	50160.00		P
137 Ba	51.347	50.340	ug/l	3.24	4500.00	88093.33		P
139 La	52.469	51.440	ug/l	3.37	4500.00	860209.63		M
140 Ce	51.265	50.260	ug/l	2.43	4500.00	814576.63		P
199 Hg	1.119	1.097	ug/l	1.07	450.00	1360.33		P
200 Hg	1.142	1.120	ug/l	5.87	450.00	1880.00		P
202 Hg	1.112	1.090	ug/l	4.93	450.00	2379.67		P
203 Tl	51.857	50.840	ug/l	3.60	4500.00	260283.30		P
205 Tl	50.602	49.610	ug/l	3.87	4500.00	624043.31		P
206 Pb	51.887	50.870	ug/l	4.84	4500.00	208810.00		P
207 Pb	52.520	51.490	ug/l	4.40	4500.00	192313.30		P
208 Pb	52.132	51.110	ug/l	4.57	4500.00	863900.00		P
232 Th	53.683	52.630	ug/l	2.70	4500.00	932772.19		P
238 U	52.448	51.420	ug/l	3.45	4500.00	960826.50		M

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1078666.30	1.16	1107761.60	97.4	60.000002	-	125
72 Ge	1411165.10	1.65	1463530.60	96.4	60.000002	-	125
89 Y	1926267.40	1.04	1932167.40	99.7	60.000002	-	125
115 In	1887805.80	1.22	1952569.30	96.7	60.000002	-	125
209 Bi	4096579.80	2.06	4087579.80	100.2	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00836

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\024SMPL.D\024SMPL.D#
Date Acquired: Feb 6 2018 03:32 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.032	-0.032	ug/l	79.10	4500.00	444.44		P
11 B	-1.000	-1.000	ug/l	2.92	4500.00	2514.44		P
27 Al	0.048	0.048	ug/l	135.66	4500.00	6540.00		P
47 Ti	-0.001	-0.001	ug/l	15341.00	4500.00	223.33		P
51 V	0.028	0.028	ug/l	252.60	4500.00	3414.58		P
52 Cr	0.169	0.169	ug/l	67.42	4500.00	14963.33		P
53 Cr	0.093	0.093	ug/l	29.99	4500.00	1030.00		P
55 Mn	0.064	0.064	ug/l	46.30	4500.00	3340.00		P
57 Fe	19.990	19.990	ug/l	37.99	4500.00	34426.67		P
59 Co	-0.006	-0.006	ug/l	371.65	4500.00	2356.67		P
60 Ni	0.050	0.050	ug/l	100.46	4500.00	576.67		P
62 Ni	-0.151	-0.151	ug/l	51.76	4500.00	383.33		P
63 Cu	-0.019	-0.019	ug/l	259.88	4500.00	1480.00		P
65 Cu	0.002	0.002	ug/l	1152.00	4500.00	696.67		P
66 Zn	0.061	0.061	ug/l	46.91	4500.00	629.83		P
75 As	-0.009	-0.009	ug/l	502.98	4500.00	509.19		P
77 Se	0.044	0.044	ug/l	516.32	4500.00	152.33		P
79 Br	-0.664	-0.664	ug/l	---	#VALUE!	530.00		P
82 Se	0.093	0.093	ug/l	221.73	4500.00	62.40		P
88 Sr	0.002	0.002	ug/l	745.17	4500.00	1670.00		P
95 Mo	0.194	0.194	ug/l	11.51	4500.00	976.67		P
97 Mo	0.141	0.141	ug/l	55.28	4500.00	590.00		P
98 Mo	0.127	0.127	ug/l	29.14	4500.00	1337.01		P
107 Ag	0.268	0.268	ug/l	23.00	1800.00	2246.67		P
109 Ag	0.264	0.264	ug/l	17.69	1800.00	2073.33		P
111 Cd	0.044	0.044	ug/l	96.17	4500.00	1021.68		P
114 Cd	0.015	0.015	ug/l	95.15	4500.00	262.21		P
118 Sn	0.281	0.281	ug/l	25.65	4500.00	2610.00		P
121 Sb	0.184	0.184	ug/l	8.30	4500.00	1929.33		P
123 Sb	0.193	0.193	ug/l	6.72	4500.00	1519.67		P
135 Ba	-0.003	-0.003	ug/l	1368.40	4500.00	173.33		P
137 Ba	0.000	0.000	ug/l	4211.80	4500.00	283.33		P
139 La	0.031	0.031	ug/l	45.35	4500.00	1003.33		P
140 Ce	0.026	0.026	ug/l	33.12	4500.00	930.00		P
199 Hg	0.016	0.016	ug/l	40.99	450.00	117.33		P
200 Hg	0.016	0.016	ug/l	97.66	450.00	138.67		P
202 Hg	0.016	0.016	ug/l	27.66	450.00	162.00		P
203 Tl	0.106	0.106	ug/l	17.23	4500.00	1840.00		P
205 Tl	0.128	0.128	ug/l	11.25	4500.00	4266.67		P
206 Pb	0.038	0.038	ug/l	120.58	4500.00	980.00		P
207 Pb	0.044	0.044	ug/l	72.18	4500.00	1010.00		P
208 Pb	0.042	0.042	ug/l	75.00	4500.00	4093.33		P
232 Th	0.282	0.282	ug/l	12.42	4500.00	12433.33		P
238 U	-0.010	-0.010	ug/l	185.02	4500.00	3500.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1088894.90	2.03	1107761.60	98.3	60.000002	-	125
72 Ge	1450810.30	3.45	1463530.60	99.1	60.000002	-	125
89 Y	1957228.10	1.94	1932167.40	101.3	60.000002	-	125
115 In	1979110.90	1.45	1952569.30	101.4	60.000002	-	125
209 Bi	4370077.00	0.85	4087579.80	106.9	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00837

QCS QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\025ICSA.D\025ICSA.D#
Date Acquired: Feb 6 2018 03:35 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: **ICSA**
Misc Info: ICPMS-200.8-W-D
Vial Number: 4106
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: ICSA
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range(%)	Flag
9 Be	-0.13	ug/l	12.34	---	##### - #####	
11 B	47.70	ug/l	1.50	---	##### - #####	
27 Al	38380.00	ug/l	1.68	40000.00	70 - 130	
47 Ti	791.20	ug/l	1.95	800.00	70 - 130	
51 V	0.06	ug/l	222.85	---	##### - #####	
52 Cr	1.84	ug/l	3.76	---	##### - #####	
53 Cr	4.07	ug/l	11.25	---	##### - #####	
55 Mn	0.24	ug/l	11.24	---	##### - #####	
57 Fe	88810.00	ug/l	2.68	#########	70 - 130	
59 Co	0.04	ug/l	69.14	---	##### - #####	
60 Ni	1.23	ug/l	15.90	---	##### - #####	
62 Ni	2.81	ug/l	13.27	---	##### - #####	
63 Cu	2.42	ug/l	2.73	---	##### - #####	
65 Cu	1.26	ug/l	7.19	---	##### - #####	
66 Zn	2.14	ug/l	15.02	---	##### - #####	
69 (Zn)	--------	ug/l	--------	---	##### - #####	
75 As	0.06	ug/l	95.83	---	##### - #####	
77 Se	11.61	ug/l	2.21	---	##### - #####	
79 Br	7.84	ug/l	6.83	---	##### - #####	
82 Se	-0.13	ug/l	82.54	---	##### - #####	
83 Kr	--------	ug/l	--------	---	##### - #####	
88 Sr	0.42	ug/l	9.02	---	##### - #####	
95 Mo	818.40	ug/l	2.55	800.00	70 - 130	
97 Mo	815.20	ug/l	1.95	800.00	70 - 130	
98 Mo	820.70	ug/l	1.27	800.00	70 - 130	
99 Ru	--------	ug/l	--------	---	##### - #####	
102	--------	ug/l	--------	---	##### - #####	
103 Rh	--------		--------	---	##### - #####	
106 (Cd)	--------	ug/l	--------	---	##### - #####	
107 Ag	0.38	ug/l	21.03	---	##### - #####	
108 (Cd)	--------	ug/l	--------	---	##### - #####	
109 Ag	0.38	ug/l	19.46	---	##### - #####	
111 Cd	-0.12	ug/l	78.49	---	##### - #####	
114 Cd	-0.10	ug/l	26.85	---	##### - #####	
118 Sn	0.17	ug/l	38.88	---	##### - #####	
121 Sb	0.13	ug/l	8.78	---	##### - #####	
123 Sb	0.14	ug/l	11.99	---	##### - #####	
135 Ba	0.06	ug/l	61.67	---	##### - #####	
137 Ba	0.03	ug/l	9.25	---	##### - #####	
139 La	0.01	ug/l	72.09	---	##### - #####	
140 Ce	0.03	ug/l	20.52	---	##### - #####	
199 Hg	0.04	ug/l	29.73	---	##### - #####	
200 Hg	0.03	ug/l	5.48	---	##### - #####	
202 Hg	0.03	ug/l	9.34	---	##### - #####	
203 Tl	-0.04	ug/l	38.04	---	##### - #####	
205 Tl	-0.03	ug/l	68.32	---	##### - #####	
206 Pb	0.30	ug/l	8.34	---	##### - #####	
207 Pb	0.29	ug/l	0.91	---	##### - #####	
208 Pb	0.31	ug/l	7.50	---	##### - #####	
232 Th	5.12	ug/l	1.12	---	##### - #####	
238 U	-0.09	ug/l	7.16	---	##### - #####	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1042000.40	0.65	1107761.60	94.1	60 - 125	
72 Ge	1443757.80	3.05	1463530.60	98.6	60 - 125	
89 Y	1843618.00	1.69	1932167.40	95.4	60 - 125	
115 In	1885020.90	2.23	1952569.30	96.5	60 - 125	
209 Bi	4081283.00	0.90	4087579.80	99.8	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failure: 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00838

QCS QC Report **ICPMS202-B**

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\026AB.D\026AB.D#
Date Acquired: Feb 6 2018 03:38 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: **ICSAB**
Misc Info: ICPMS-200.8-W-D
Vial Number: 4107
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: ICSAB
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range(%)	Flag
9 Be	-0.12	ug/l	14.27	---	##### - #####	
11 B	0.98	ug/l	11.75	---	##### - #####	
27 Al	37620.00	ug/l	0.78	40000.00	70 - 130	
47 Ti	774.40	ug/l	1.30	800.00	70 - 130	
51 V	19.10	ug/l	2.25	20.00	70 - 130	
52 Cr	20.22	ug/l	2.17	20.00	70 - 130	
53 Cr	22.98	ug/l	1.33	20.00	70 - 130	
55 Mn	19.26	ug/l	1.09	20.00	70 - 130	
57 Fe	86690.00	ug/l	2.16	100000.00	70 - 130	
59 Co	19.30	ug/l	2.07	20.00	70 - 130	
60 Ni	20.65	ug/l	0.63	20.00	70 - 130	
62 Ni	22.91	ug/l	3.81	20.00	70 - 130	
63 Cu	20.85	ug/l	3.57	20.00	70 - 130	
65 Cu	20.09	ug/l	2.83	20.00	70 - 130	
66 Zn	11.14	ug/l	0.87	10.00	70 - 130	
75 As	9.97	ug/l	3.02	10.00	70 - 130	
77 Se	21.45	ug/l	2.62	10.00	70 - 130	
79 Br	7.06	ug/l	11.70	---	##### - #####	
82 Se	9.04	ug/l	3.76	10.00	70 - 130	
88 Sr	0.38	ug/l	1.14	---	##### - #####	
95 Mo	805.30	ug/l	1.73	800.00	70 - 130	
97 Mo	808.80	ug/l	3.88	800.00	70 - 130	
98 Mo	812.40	ug/l	1.68	800.00	70 - 130	
107 Ag	20.40	ug/l	2.02	20.00	70 - 130	
109 Ag	20.37	ug/l	1.32	20.00	70 - 130	
111 Cd	9.70	ug/l	1.89	10.00	70 - 130	
114 Cd	10.00	ug/l	1.27	10.00	70 - 130	
118 Sn	-0.05	ug/l	48.85	---	##### - #####	
121 Sb	0.03	ug/l	9.48	---	##### - #####	
123 Sb	0.03	ug/l	58.71	---	##### - #####	
135 Ba	0.01	ug/l	549.48	---	##### - #####	
137 Ba	0.00	ug/l	379.04	---	##### - #####	
139 La	0.02	ug/l	16.56	---	##### - #####	
140 Ce	0.04	ug/l	10.08	---	##### - #####	
199 Hg	0.02	ug/l	75.49	---	##### - #####	
200 Hg	0.02	ug/l	18.99	---	##### - #####	
202 Hg	0.01	ug/l	66.85	---	##### - #####	
203 Tl	-0.11	ug/l	21.55	---	##### - #####	
205 Tl	-0.08	ug/l	1.59	---	##### - #####	
206 Pb	0.35	ug/l	8.03	---	##### - #####	
207 Pb	0.31	ug/l	13.96	---	##### - #####	
208 Pb	0.31	ug/l	2.45	---	##### - #####	
232 Th	1.90	ug/l	7.16	---	##### - #####	
238 U	-0.09	ug/l	5.57	---	##### - #####	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1052438.40	1.36	1107761.60	95.0	60 - 125	
72 Ge	1482453.40	1.85	1463530.60	101.3	60 - 125	
89 Y	1880621.30	2.31	1932167.40	97.3	60 - 125	
115 In	1940641.10	1.21	1952569.30	99.4	60 - 125	
209 Bi	4051249.80	1.71	4087579.80	99.1	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

Sample QC Report ICPMS202-B

Data File:	C:\ICPCHEM\1\DATA\18B06o00.B\027SMPL.D\027SMPL.D#
Date Acquired:	Feb 6 2018 03:40 pm
Acq. Method:	208CLdsa.M
Operator:	JPV
Sample Name:	ULR3
Misc Info:	ICPMS-6020-W-D
Vial Number:	4103
Current Method:	C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File:	C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update:	Feb 06 2018 03:13 pm
Sample Type:	Sample
Dilution Factor:	1.00
Autodil Factor:	Undiluted
Final Dil Factor:	1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.057	-0.057	ug/l	43.48	4500.00	417.78		P
11 B	-0.836	-0.836	ug/l	6.02	4500.00	2841.11		P
27 Al	39.540	39.540	ug/l	13.96	4500.00	223053.30		P
47 Ti	4,503.000	4503.000	ug/l	0.44	4500.00	2722996.00	> Cal	A
51 V	-0.042	-0.042	ug/l	191.38	4500.00	3097.79		P
52 Cr	-0.234	-0.234	ug/l	26.14	4500.00	13186.67		P
53 Cr	0.028	0.028	ug/l	553.87	4500.00	1053.33		P
55 Mn	0.216	0.216	ug/l	18.04	4500.00	4946.67		P
57 Fe	83.540	83.540	ug/l	13.26	4500.00	49616.66		P
59 Co	0.107	0.107	ug/l	20.44	4500.00	3476.67		P
60 Ni	0.550	0.550	ug/l	9.71	4500.00	1573.33		P
62 Ni	5.730	5.730	ug/l	14.78	4500.00	2090.00		P
63 Cu	0.484	0.484	ug/l	11.88	4500.00	3940.00		P
65 Cu	1.177	1.177	ug/l	2.77	4500.00	3373.33		P
66 Zn	1.065	1.065	ug/l	19.71	4500.00	2069.74		P
75 As	0.062	0.062	ug/l	5.05	4500.00	669.94		P
77 Se	0.261	0.261	ug/l	62.54	4500.00	185.00		P
79 Br	0.098	0.098	ug/l	---	#VALUE!	766.67		P
82 Se	-0.390	-0.390	ug/l	12.91	4500.00	4.13		P
88 Sr	0.012	0.012	ug/l	172.28	4500.00	1913.33		P
95 Mo	5,050.000	5050.000	ug/l	1.42	4500.00	11040690.00	> Cal	A
97 Mo	5,085.000	5085.000	ug/l	1.54	4500.00	6868747.00	> Cal	A
98 Mo	5,108.000	5108.000	ug/l	0.30	4500.00	17778280.00	> Cal	A
107 Ag	0.028	0.028	ug/l	37.62	1800.00	915.56		P
109 Ag	0.033	0.033	ug/l	58.94	1800.00	838.89		P
111 Cd	0.139	0.139	ug/l	69.58	4500.00	1186.49		P
114 Cd	-4.808	-4.808	ug/l	14.84	4500.00	-15098.61		P
118 Sn	5,262.000	5262.000	ug/l	1.24	4500.00	18483480.00	> Cal	A
121 Sb	5,141.000	5141.000	ug/l	1.41	4500.00	28260640.00	> Cal	A
123 Sb	5,119.000	5119.000	ug/l	1.47	4500.00	21788180.00	> Cal	A
135 Ba	0.346	0.346	ug/l	6.32	4500.00	550.00		P
137 Ba	1.673	1.673	ug/l	1.90	4500.00	3446.67		P
139 La	0.127	0.127	ug/l	14.48	4500.00	2773.33		P
140 Ce	0.013	0.013	ug/l	24.86	4500.00	733.33		P
199 Hg	0.007	0.007	ug/l	104.19	450.00	110.67		P
200 Hg	0.014	0.014	ug/l	7.41	450.00	140.33		P
202 Hg	0.006	0.006	ug/l	58.65	450.00	145.00		P
203 Tl	0.047	0.047	ug/l	57.61	4500.00	1580.00		P
205 Tl	0.062	0.062	ug/l	14.60	4500.00	3513.33		P
206 Pb	0.230	0.230	ug/l	8.89	4500.00	1890.00		P
207 Pb	0.219	0.219	ug/l	10.11	4500.00	1770.00		P
208 Pb	0.239	0.239	ug/l	3.96	4500.00	7930.00		P
232 Th	8.338	8.338	ug/l	5.13	4500.00	170166.70		P
238 U	-0.016	-0.016	ug/l	41.59	4500.00	3513.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1148655.50	1.41	1107761.60	103.7	60.000002	-	125
72 Ge	1557797.50	1.14	1463530.60	106.4	60.000002	-	125
89 Y	2067370.60	0.23	1932167.40	107.0	60.000002	-	125
115 In	2039850.90	1.38	1952569.30	104.5	60.000002	-	125
209 Bi	4541189.00	1.08	4087579.80	111.1	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

7 :Element Failures	0 :Max. Number of Failures Allowed
0 :ISTD Failures	0 :Max. Number of ISTD Failures Allowed

Data Results:

Analytes:	Fail
ISTD:	Pass

ED_004985_00011411-00840

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\028SMPL.D\028SMPL.D#
Date Acquired: Feb 6 2018 03:43 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: ULR2
Misc Info: ICPMS-6020-W-D
Vial Number: 4104
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	4,781.000	4781.000	ug/l	2.35	4500.00	9102620.00	> Cal	A
11 B	5,310.000	5310.000	ug/l	4.45	4500.00	5797596.00		A
27 Al	4,464.000	4464.000	ug/l	3.92	4500.00	23171100.00		A
47 Ti	4.522	4.522	ug/l	7.16	4500.00	2926.67		P
51 V	4,481.000	4481.000	ug/l	0.15	4500.00	36674832.00		A
52 Cr	4,446.000	4446.000	ug/l	1.87	4500.00	31442530.00		A
53 Cr	4,507.000	4507.000	ug/l	1.64	4500.00	3676969.00	> Cal	A
55 Mn	4,523.000	4523.000	ug/l	1.42	4500.00	39857712.00		A
57 Fe	4,505.000	4505.000	ug/l	1.76	4500.00	914478.31		A
59 Co	4,786.000	4786.000	ug/l	0.73	4500.00	39316768.00	> Cal	A
60 Ni	4,772.000	4772.000	ug/l	1.00	4500.00	8967571.00	> Cal	A
62 Ni	5,103.000	5103.000	ug/l	0.27	4500.00	1434094.00		A
63 Cu	4,976.000	4976.000	ug/l	0.60	4500.00	22868830.00		A
65 Cu	5,124.000	5124.000	ug/l	0.86	4500.00	11263540.00		A
66 Zn	4,945.000	4945.000	ug/l	0.81	4500.00	6759685.00		A
75 As	4,863.000	4863.000	ug/l	1.32	4500.00	8266635.00	> Cal	A
77 Se	5,227.000	5227.000	ug/l	1.71	4500.00	506926.31	> Cal	P
79 Br	20.870	20.870	ug/l	---	#VALUE!	6013.33		P
82 Se	5,006.000	5006.000	ug/l	1.80	4500.00	643595.13	> Cal	P
88 Sr	4,730.000	4730.000	ug/l	2.32	4500.00	53722880.00		A
95 Mo	11.160	11.160	ug/l	8.52	4500.00	25506.67		P
97 Mo	10.810	10.810	ug/l	9.48	4500.00	15343.33		P
98 Mo	11.280	11.280	ug/l	8.65	4500.00	41052.55		P
107 Ag	2,146.000	2146.000	ug/l	1.24	1800.00	12815350.00	> Cal	A
109 Ag	2,128.000	2128.000	ug/l	1.81	1800.00	12212360.00	> Cal	A
111 Cd	4,996.000	4996.000	ug/l	1.34	4500.00	7233627.00	> Cal	A
114 Cd	4,995.000	4995.000	ug/l	2.16	4500.00	16245970.00	> Cal	A
118 Sn	8.431	8.431	ug/l	4.96	4500.00	31976.67		P
121 Sb	16.190	16.190	ug/l	15.61	4500.00	91890.66		P
123 Sb	16.400	16.400	ug/l	15.40	4500.00	72010.34		P
135 Ba	4,933.000	4933.000	ug/l	0.65	4500.00	5371087.00		A
137 Ba	4,849.000	4849.000	ug/l	1.78	4500.00	9335963.00		A
139 La	0.091	0.091	ug/l	3.67	4500.00	2153.33		P
140 Ce	0.008	0.008	ug/l	29.42	4500.00	650.00		P
199 Hg	0.024	0.024	ug/l	54.68	450.00	129.00		P
200 Hg	0.020	0.020	ug/l	29.88	450.00	147.33		P
202 Hg	0.046	0.046	ug/l	11.99	450.00	231.00		P
203 Tl	4,918.000	4918.000	ug/l	0.27	4500.00	27118460.00	> Cal	A
205 Tl	4,832.000	4832.000	ug/l	1.57	4500.00	65512192.00	> Cal	A
206 Pb	4,969.000	4969.000	ug/l	1.68	4500.00	21991150.00		A
207 Pb	5,001.000	5001.000	ug/l	1.33	4500.00	20127180.00		A
208 Pb	4,990.000	4990.000	ug/l	0.90	4500.00	90937120.00	> Cal	A
232 Th	5,255.000	5255.000	ug/l	2.38	4500.00	##########	> Cal	A
238 U	5,010.000	5010.000	ug/l	1.57	4500.00	##########	> Cal	A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1088398.80	2.37	1107761.60	98.3	60.000002	-	125
72 Ge	1533155.50	1.07	1463530.60	104.8	60.000002	-	125
89 Y	1977168.30	0.56	1932167.40	102.3	60.000002	-	125
115 In	2082938.80	0.60	1952569.30	106.7	60.000002	-	125
209 Bi	4430512.50	1.34	4087579.80	108.4	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

16 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Fail
ISTD: Pass

ED_004985_00011411-00841

CCB QC Report **ICPMS202-B**

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\029_CCB.D\029_CCB.D#
Date Acquired: Feb 6 2018 03:45 pm
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:13 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	3.602	ug/l	18.88	0.09	Fail
11 B	30.000	ug/l	6.05	1.18	Fail
27 Al	19.930	ug/l	5.18	0.38	Fail
47 Ti	2.294	ug/l	21.29	0.17	Fail
51 V	3.447	ug/l	13.39	0.09	Fail
52 Cr	3.460	ug/l	16.26	0.12	Fail
53 Cr	4.489	ug/l	22.28	0.13	Fail
55 Mn	3.691	ug/l	15.60	0.14	Fail
57 Fe	37.320	ug/l	18.77	4.00	Fail
59 Co	3.558	ug/l	15.41	0.04	Fail
60 Ni	3.723	ug/l	18.37	0.08	Fail
62 Ni	3.749	ug/l	21.41	0.32	Fail
63 Cu	3.766	ug/l	15.06	0.09	Fail
65 Cu	3.817	ug/l	18.42	0.22	Fail
66 Zn	3.699	ug/l	13.19	0.10	Fail
75 As	4.499	ug/l	15.41	0.12	Fail
77 Se	6.673	ug/l	15.92	1.22	Fail
79 Br	0.528	ug/l	124.15	#VALUE!	
82 Se	5.455	ug/l	16.72	0.32	Fail
88 Sr	3.547	ug/l	15.20	0.05	Fail
95 Mo	3.080	ug/l	4.07	0.05	Fail
97 Mo	3.077	ug/l	10.51	0.03	Fail
98 Mo	3.140	ug/l	3.39	0.03	Fail
107 Ag	2.364	ug/l	16.51	0.09	Fail
109 Ag	2.351	ug/l	13.14	0.10	Fail
111 Cd	3.717	ug/l	12.22	0.03	Fail
114 Cd	3.801	ug/l	15.57	0.03	Fail
118 Sn	2.026	ug/l	9.00	0.05	Fail
121 Sb	2.224	ug/l	5.13	0.03	Fail
123 Sb	2.227	ug/l	5.42	0.04	Fail
135 Ba	3.840	ug/l	16.20	0.09	Fail
137 Ba	3.829	ug/l	12.42	0.08	Fail
139 La	-0.010	ug/l	13.39	0.02	
140 Ce	-0.013	ug/l	19.25	0.02	
199 Hg	-0.004	ug/l	129.06	0.03	
200 Hg	0.001	ug/l	725.08	0.03	
202 Hg	0.001	ug/l	597.91	0.03	
203 Tl	4.104	ug/l	13.81	0.03	Fail
205 Tl	4.082	ug/l	14.69	0.02	Fail
206 Pb	4.052	ug/l	13.90	#VALUE!	
207 Pb	4.163	ug/l	12.53	#VALUE!	
208 Pb	4.095	ug/l	13.48	0.02	Fail
232 Th	10.250	ug/l	10.43	0.06	Fail
238 U	3.784	ug/l	13.38	0.02	Fail

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1071432.50	1.23	1107761.60	96.7	60 - 125	
72 Ge	1478089.90	2.57	1463530.60	101.0	60 - 125	
89 Y	1980471.80	0.86	1932167.40	102.5	60 - 125	
115 In	1982436.50	2.12	1952569.30	101.5	60 - 125	
209 Bi	4338959.00	0.97	4087579.80	106.1	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

36 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Fail
ISTD: Pass

ED_004985_00011411-00842

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\030SMPL.D\030SMPL.D#
Date Acquired: Feb 6 2018 03:48 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	1.682	1.682	ug/l	11.00	4500.00	3614.44		P
11 B	16.350	16.350	ug/l	3.06	4500.00	20943.33		P
27 Al	12.940	12.940	ug/l	6.16	4500.00	71660.00		P
47 Ti	1.345	1.345	ug/l	11.05	4500.00	1003.33		P
51 V	1.442	1.442	ug/l	10.87	4500.00	14687.42		P
52 Cr	1.465	1.465	ug/l	6.61	4500.00	24170.00		P
53 Cr	2.200	2.200	ug/l	15.71	4500.00	2713.33		P
55 Mn	1.877	1.877	ug/l	6.63	4500.00	18860.00		P
57 Fe	24.460	24.460	ug/l	18.00	4500.00	36056.67		P
59 Co	1.632	1.632	ug/l	8.44	4500.00	15416.67		P
60 Ni	1.755	1.755	ug/l	8.62	4500.00	3686.67		P
62 Ni	1.317	1.317	ug/l	31.06	4500.00	790.00		P
63 Cu	1.681	1.681	ug/l	5.83	4500.00	9070.00		P
65 Cu	1.815	1.815	ug/l	7.66	4500.00	4566.67		P
66 Zn	1.687	1.687	ug/l	5.58	4500.00	2792.88		P
75 As	1.939	1.939	ug/l	5.43	4500.00	3724.13		P
77 Se	2.734	2.734	ug/l	8.33	4500.00	408.00		P
79 Br	-0.161	-0.161	ug/l	---	#VALUE!	666.67		P
82 Se	2.135	2.135	ug/l	21.56	4500.00	317.53		P
88 Sr	1.604	1.604	ug/l	9.81	4500.00	19303.33		P
95 Mo	1.733	1.733	ug/l	4.08	4500.00	4253.33		P
97 Mo	1.616	1.616	ug/l	3.78	4500.00	2530.00		P
98 Mo	1.725	1.725	ug/l	3.34	4500.00	6747.91		P
107 Ag	1.003	1.003	ug/l	7.44	1800.00	6432.22		P
109 Ag	0.987	0.987	ug/l	6.72	1800.00	6031.11		P
111 Cd	1.683	1.683	ug/l	10.79	4500.00	3283.42		P
114 Cd	1.693	1.693	ug/l	9.55	4500.00	5458.32		P
118 Sn	1.052	1.052	ug/l	10.56	4500.00	5253.33		P
121 Sb	1.370	1.370	ug/l	4.23	4500.00	8273.33		P
123 Sb	1.376	1.376	ug/l	3.07	4500.00	6424.00		P
135 Ba	1.679	1.679	ug/l	8.81	4500.00	1916.67		P
137 Ba	1.650	1.650	ug/l	7.28	4500.00	3310.00		P
139 La	-0.014	-0.014	ug/l	25.16	4500.00	220.00		P
140 Ce	-0.011	-0.011	ug/l	46.22	4500.00	310.00		P
199 Hg	-0.002	-0.002	ug/l	209.77	450.00	94.33		P
200 Hg	0.002	0.002	ug/l	490.93	450.00	114.00		P
202 Hg	0.001	0.001	ug/l	54.79	450.00	127.33		P
203 Tl	1.855	1.855	ug/l	3.34	4500.00	11333.33		P
205 Tl	1.827	1.827	ug/l	4.84	4500.00	26930.00		P
206 Pb	2.188	2.188	ug/l	5.08	4500.00	10346.67		P
207 Pb	2.230	2.230	ug/l	5.00	4500.00	9670.00		P
208 Pb	2.199	2.199	ug/l	6.18	4500.00	42780.00		P
232 Th	3.391	3.391	ug/l	3.27	4500.00	70683.33		P
238 U	1.662	1.662	ug/l	4.92	4500.00	36646.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1062953.40	2.89	1107761.60	96.0	60.000002	-	125
72 Ge	1483005.90	1.62	1463530.60	101.3	60.000002	-	125
89 Y	1964411.10	0.79	1932167.40	101.7	60.000002	-	125
115 In	1984615.10	1.45	1952569.30	101.6	60.000002	-	125
209 Bi	4361942.50	0.43	4087579.80	106.7	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00843

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\031SMPL.D\031SMPL.D#
Date Acquired: Feb 6 2018 03:50 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	1.008	1.008	ug/l	6.09	4500.00	2438.89		P
11 B	10.050	10.050	ug/l	2.54	4500.00	14663.33		P
27 Al	8.896	8.896	ug/l	3.44	4500.00	52790.00		P
47 Ti	0.898	0.898	ug/l	3.38	4500.00	743.33		P
51 V	0.955	0.955	ug/l	12.01	4500.00	10790.04		P
52 Cr	0.824	0.824	ug/l	15.02	4500.00	19696.67		P
53 Cr	1.128	1.128	ug/l	22.41	4500.00	1860.00		P
55 Mn	1.261	1.261	ug/l	4.48	4500.00	13556.67		P
57 Fe	18.450	18.450	ug/l	43.08	4500.00	34753.33		P
59 Co	1.018	1.018	ug/l	7.06	4500.00	10493.33		P
60 Ni	1.107	1.107	ug/l	8.88	4500.00	2503.33		P
62 Ni	0.815	0.815	ug/l	50.88	4500.00	650.00		P
63 Cu	1.028	1.028	ug/l	2.44	4500.00	6146.67		P
65 Cu	1.132	1.132	ug/l	1.75	4500.00	3103.33		P
66 Zn	0.996	0.996	ug/l	12.00	4500.00	1869.56		P
75 As	1.229	1.229	ug/l	3.26	4500.00	2546.23		P
77 Se	1.510	1.510	ug/l	13.23	4500.00	292.00		P
79 Br	-0.405	-0.405	ug/l	---	#VALUE!	603.33		P
82 Se	1.486	1.486	ug/l	9.52	4500.00	236.07		P
88 Sr	1.018	1.018	ug/l	6.28	4500.00	12816.67		P
95 Mo	1.119	1.119	ug/l	10.21	4500.00	2943.33		P
97 Mo	1.045	1.045	ug/l	3.43	4500.00	1780.00		P
98 Mo	1.050	1.050	ug/l	9.16	4500.00	4464.57		P
107 Ag	0.655	0.655	ug/l	10.90	1800.00	4455.56		P
109 Ag	0.661	0.661	ug/l	9.53	1800.00	4246.67		P
111 Cd	0.947	0.947	ug/l	5.48	4500.00	2269.07		P
114 Cd	1.029	1.029	ug/l	6.61	4500.00	3404.05		P
118 Sn	0.615	0.615	ug/l	13.17	4500.00	3756.67		P
121 Sb	0.930	0.930	ug/l	3.63	4500.00	5918.33		P
123 Sb	0.919	0.919	ug/l	3.54	4500.00	4533.33		P
135 Ba	1.082	1.082	ug/l	17.41	4500.00	1296.67		P
137 Ba	1.041	1.041	ug/l	10.18	4500.00	2193.33		P
139 La	-0.012	-0.012	ug/l	6.81	4500.00	250.00		P
140 Ce	-0.017	-0.017	ug/l	17.36	4500.00	203.33		P
199 Hg	-0.005	-0.005	ug/l	109.98	450.00	91.67		P
200 Hg	-0.006	-0.006	ug/l	127.86	450.00	101.00		P
202 Hg	-0.002	-0.002	ug/l	259.55	450.00	121.33		P
203 Tl	1.183	1.183	ug/l	3.86	4500.00	7720.00		P
205 Tl	1.210	1.210	ug/l	5.16	4500.00	18780.00		P
206 Pb	1.546	1.546	ug/l	9.88	4500.00	7580.00		P
207 Pb	1.469	1.469	ug/l	3.09	4500.00	6686.67		P
208 Pb	1.468	1.468	ug/l	2.85	4500.00	29786.67		P
232 Th	1.871	1.871	ug/l	4.15	4500.00	42383.33		P
238 U	1.041	1.041	ug/l	5.34	4500.00	24440.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1095220.60	1.42	1107761.60	98.9	60.000002	-	125
72 Ge	1477186.80	3.43	1463530.60	100.9	60.000002	-	125
89 Y	1968099.60	0.17	1932167.40	101.9	60.000002	-	125
115 In	1984681.40	1.64	1952569.30	101.6	60.000002	-	125
209 Bi	4382107.00	1.70	4087579.80	107.2	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00844

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\032CCV.D\032CCV.D#
Date Acquired: Feb 6 2018 03:53 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	52.150	ug/l	1.11	50.00	85 - 115	90 - 110	
11 B	58.930	ug/l	1.58	50.00	85 - 115	90 - 110	>15%
27 Al	56.950	ug/l	2.29	50.00	85 - 115	90 - 110	>10%
47 Ti	50.900	ug/l	0.78	50.00	85 - 115	90 - 110	
51 V	50.240	ug/l	1.11	50.00	85 - 115	90 - 110	
52 Cr	50.190	ug/l	1.94	50.00	85 - 115	90 - 110	
53 Cr	51.420	ug/l	2.92	50.00	85 - 115	90 - 110	
55 Mn	51.060	ug/l	1.47	50.00	85 - 115	90 - 110	
57 Fe	1323.000	ug/l	2.80	1300.00	85 - 115	90 - 110	
59 Co	51.460	ug/l	1.46	50.00	85 - 115	90 - 110	
60 Ni	53.120	ug/l	0.94	50.00	85 - 115	90 - 110	
62 Ni	51.880	ug/l	1.70	50.00	85 - 115	90 - 110	
63 Cu	52.790	ug/l	1.09	50.00	85 - 115	90 - 110	
65 Cu	53.900	ug/l	0.72	50.00	85 - 115	90 - 110	
66 Zn	53.280	ug/l	0.55	50.00	85 - 115	90 - 110	
75 As	53.580	ug/l	1.57	50.00	85 - 115	90 - 110	
77 Se	52.960	ug/l	1.53	50.00	85 - 115	90 - 110	
79 Br	0.600	ug/l	32.38	---	#### - ####	#### - ####	
82 Se	52.700	ug/l	2.47	50.00	85 - 115	90 - 110	
88 Sr	52.300	ug/l	2.23	50.00	85 - 115	90 - 110	
95 Mo	53.180	ug/l	0.39	50.00	85 - 115	90 - 110	
97 Mo	53.900	ug/l	1.24	50.00	85 - 115	90 - 110	
98 Mo	53.040	ug/l	0.38	50.00	85 - 115	90 - 110	
107 Ag	21.010	ug/l	1.33	20.00	85 - 115	90 - 110	
109 Ag	21.030	ug/l	2.17	20.00	85 - 115	90 - 110	
111 Cd	54.040	ug/l	1.52	50.00	85 - 115	90 - 110	
114 Cd	54.320	ug/l	1.71	50.00	85 - 115	90 - 110	
118 Sn	54.790	ug/l	1.70	50.00	85 - 115	90 - 110	
121 Sb	54.020	ug/l	1.66	50.00	85 - 115	90 - 110	
123 Sb	54.140	ug/l	1.67	50.00	85 - 115	90 - 110	
135 Ba	54.260	ug/l	1.36	50.00	85 - 115	90 - 110	
137 Ba	53.220	ug/l	1.19	50.00	85 - 115	90 - 110	
139 La	52.340	ug/l	3.13	50.00	85 - 115	90 - 110	
140 Ce	52.100	ug/l	0.57	50.00	85 - 115	90 - 110	
199 Hg	1.081	ug/l	4.74	1.00	85 - 115	90 - 110	
200 Hg	1.110	ug/l	1.49	1.00	85 - 115	90 - 110	>10%
202 Hg	1.101	ug/l	0.98	1.00	85 - 115	90 - 110	>10%
203 Tl	53.520	ug/l	0.69	50.00	85 - 115	90 - 110	
205 Tl	52.530	ug/l	1.04	50.00	85 - 115	90 - 110	
206 Pb	54.360	ug/l	0.06	50.00	85 - 115	90 - 110	
207 Pb	54.430	ug/l	0.56	50.00	85 - 115	90 - 110	
208 Pb	54.230	ug/l	0.32	50.00	85 - 115	90 - 110	
232 Th	58.220	ug/l	2.29	50.00	85 - 115	90 - 110	>15%
238 U	54.720	ug/l	0.71	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1088098.80	0.73	1107761.60	98.2	60 - 125	
72 Ge	1506488.00	1.62	1463530.60	102.9	60 - 125	
89 Y	1975985.50	0.86	1932167.40	102.3	60 - 125	
115 In	2012730.30	1.68	1952569.30	103.1	60 - 125	
209 Bi	4394256.00	0.37	4087579.80	107.5	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

QC Range 1
2 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
5 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00845

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\033SMPL.D\033SMPL.D#
Date Acquired: Feb 6 2018 03:56 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.452	0.452	ug/l	14.03	4500.00	1390.00		P
11 B	4.111	4.111	ug/l	11.10	4500.00	8237.78		P
27 Al	4.773	4.773	ug/l	2.74	4500.00	31640.00		P
47 Ti	0.409	0.409	ug/l	9.52	4500.00	466.67		P
51 V	0.525	0.525	ug/l	6.60	4500.00	7476.98		P
52 Cr	0.535	0.535	ug/l	8.85	4500.00	17900.00		P
53 Cr	0.629	0.629	ug/l	3.39	4500.00	1483.33		P
55 Mn	0.553	0.553	ug/l	6.47	4500.00	7620.00		P
57 Fe	11.460	11.460	ug/l	30.47	4500.00	33763.33		P
59 Co	0.511	0.511	ug/l	3.06	4500.00	6550.00		P
60 Ni	0.507	0.507	ug/l	18.18	4500.00	1430.00		P
62 Ni	0.423	0.423	ug/l	74.37	4500.00	550.00		P
63 Cu	0.547	0.547	ug/l	0.95	4500.00	4053.33		P
65 Cu	0.551	0.551	ug/l	6.54	4500.00	1890.00		P
66 Zn	0.556	0.556	ug/l	23.02	4500.00	1302.97		P
75 As	0.589	0.589	ug/l	10.01	4500.00	1513.11		P
77 Se	0.769	0.769	ug/l	15.99	4500.00	225.00		P
79 Br	-0.481	-0.481	ug/l	---	#VALUE!	590.00		P
82 Se	0.751	0.751	ug/l	23.92	4500.00	146.87		P
88 Sr	0.521	0.521	ug/l	9.08	4500.00	7446.67		P
95 Mo	0.795	0.795	ug/l	8.77	4500.00	2306.67		P
97 Mo	0.790	0.790	ug/l	4.94	4500.00	1476.67		P
98 Mo	0.723	0.723	ug/l	14.75	4500.00	3428.88		P
107 Ag	0.603	0.603	ug/l	6.09	1800.00	4253.33		P
109 Ag	0.630	0.630	ug/l	10.27	1800.00	4171.11		P
111 Cd	0.479	0.479	ug/l	9.02	4500.00	1659.07		P
114 Cd	0.583	0.583	ug/l	9.22	4500.00	2065.15		P
118 Sn	0.703	0.703	ug/l	11.15	4500.00	4146.67		P
121 Sb	0.497	0.497	ug/l	1.96	4500.00	3684.33		P
123 Sb	0.500	0.500	ug/l	1.74	4500.00	2859.33		P
135 Ba	0.472	0.472	ug/l	6.64	4500.00	680.00		P
137 Ba	0.521	0.521	ug/l	11.12	4500.00	1266.67		P
139 La	0.027	0.027	ug/l	54.82	4500.00	950.00		P
140 Ce	0.020	0.020	ug/l	20.49	4500.00	856.67		P
199 Hg	0.000	0.000	ug/l	24264.00	450.00	99.67		P
200 Hg	0.001	0.001	ug/l	472.53	450.00	115.00		P
202 Hg	0.000	0.000	ug/l	1015.20	450.00	128.33		P
203 Tl	0.711	0.711	ug/l	7.31	4500.00	5253.33		P
205 Tl	0.703	0.703	ug/l	2.99	4500.00	12233.33		P
206 Pb	0.624	0.624	ug/l	3.32	4500.00	3623.33		P
207 Pb	0.647	0.647	ug/l	2.70	4500.00	3483.33		P
208 Pb	0.636	0.636	ug/l	4.11	4500.00	15113.33		P
232 Th	1.031	1.031	ug/l	3.12	4500.00	27117.78		P
238 U	0.520	0.520	ug/l	6.33	4500.00	14346.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1108887.00	2.48	1107761.60	100.1	60.000002	-	125
72 Ge	1490375.80	1.92	1463530.60	101.8	60.000002	-	125
89 Y	1991118.10	0.41	1932167.40	103.1	60.000002	-	125
115 In	2027235.30	0.38	1952569.30	103.8	60.000002	-	125
209 Bi	4472249.50	0.79	4087579.80	109.4	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00846

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\034_CCB.D\034_CCB.D#
Date Acquired: Feb 6 2018 03:58 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:13 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	0.265	ug/l	13.74	0.09	Fail
11 B	2.439	ug/l	3.49	1.18	Fail
27 Al	3.723	ug/l	4.78	0.38	Fail
47 Ti	0.319	ug/l	11.20	0.17	Fail
51 V	0.247	ug/l	32.87	0.09	Fail
52 Cr	0.259	ug/l	34.26	0.12	Fail
53 Cr	0.394	ug/l	87.72	0.13	Fail
55 Mn	0.374	ug/l	2.28	0.14	Fail
57 Fe	8.522	ug/l	34.49	4.00	Fail
59 Co	0.302	ug/l	1.38	0.04	Fail
60 Ni	0.352	ug/l	12.32	0.08	Fail
62 Ni	-0.023	ug/l	543.69	0.32	
63 Cu	0.326	ug/l	5.70	0.09	Fail
65 Cu	0.301	ug/l	15.01	0.22	Fail
66 Zn	0.280	ug/l	21.25	0.10	Fail
75 As	0.400	ug/l	8.82	0.12	Fail
77 Se	0.235	ug/l	12.72	1.22	
79 Br	-0.116	ug/l	357.12	#VALUE!	
82 Se	0.411	ug/l	19.84	0.32	Fail
88 Sr	0.294	ug/l	7.65	0.05	Fail
95 Mo	0.423	ug/l	10.36	0.05	Fail
97 Mo	0.330	ug/l	32.46	0.03	Fail
98 Mo	0.378	ug/l	13.87	0.03	Fail
107 Ag	0.246	ug/l	5.50	0.09	Fail
109 Ag	0.238	ug/l	8.85	0.10	Fail
111 Cd	0.328	ug/l	16.61	0.03	Fail
114 Cd	0.340	ug/l	3.90	0.03	Fail
118 Sn	0.194	ug/l	31.30	0.05	Fail
121 Sb	0.326	ug/l	8.08	0.03	Fail
123 Sb	0.322	ug/l	4.22	0.04	Fail
135 Ba	0.333	ug/l	27.46	0.09	Fail
137 Ba	0.319	ug/l	6.98	0.08	Fail
139 La	-0.005	ug/l	68.34	0.02	
140 Ce	-0.004	ug/l	27.67	0.02	
199 Hg	-0.009	ug/l	82.67	0.03	
200 Hg	-0.003	ug/l	310.03	0.03	
202 Hg	-0.006	ug/l	62.54	0.03	
203 Tl	0.479	ug/l	8.09	0.03	Fail
205 Tl	0.450	ug/l	2.42	0.02	Fail
206 Pb	0.349	ug/l	11.48	#VALUE!	
207 Pb	0.358	ug/l	0.94	#VALUE!	
208 Pb	0.359	ug/l	5.44	0.02	Fail
232 Th	0.549	ug/l	1.88	0.06	Fail
238 U	0.306	ug/l	6.45	0.02	Fail

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1079172.40	2.01	1107761.60	97.4	60 - 125	
72 Ge	1484702.10	3.01	1463530.60	101.4	60 - 125	
89 Y	1953751.90	0.74	1932167.40	101.1	60 - 125	
115 In	1977516.90	0.99	1952569.30	101.3	60 - 125	
209 Bi	4435473.50	1.75	4087579.80	108.5	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

34 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Fail
ISTD: Pass

ED_004985_00011411-00847

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\077CCV.D\077CCV.D#
Date Acquired: Feb 6 2018 05:53 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	51.140	ug/l	0.37	50.00	85 - 115	90 - 110	
11 B	56.880	ug/l	1.36	50.00	85 - 115	90 - 110	>10%
27 Al	152.100	ug/l	6.83	50.00	85 - 115	90 - 110	>15%
47 Ti	52.470	ug/l	4.10	50.00	85 - 115	90 - 110	
51 V	52.250	ug/l	1.60	50.00	85 - 115	90 - 110	
52 Cr	54.400	ug/l	2.54	50.00	85 - 115	90 - 110	
53 Cr	56.410	ug/l	3.46	50.00	85 - 115	90 - 110	>10%
55 Mn	55.340	ug/l	2.88	50.00	85 - 115	90 - 110	>10%
57 Fe	1451.000	ug/l	2.26	1300.00	85 - 115	90 - 110	>10%
59 Co	52.340	ug/l	2.60	50.00	85 - 115	90 - 110	
60 Ni	53.310	ug/l	2.71	50.00	85 - 115	90 - 110	
62 Ni	51.330	ug/l	4.20	50.00	85 - 115	90 - 110	
63 Cu	51.460	ug/l	2.13	50.00	85 - 115	90 - 110	
65 Cu	51.170	ug/l	0.35	50.00	85 - 115	90 - 110	
66 Zn	52.330	ug/l	1.22	50.00	85 - 115	90 - 110	
75 As	51.530	ug/l	1.92	50.00	85 - 115	90 - 110	
77 Se	53.670	ug/l	4.09	50.00	85 - 115	90 - 110	
79 Br	1.970	ug/l	17.04	---	#### - ####	#### - ####	
82 Se	52.240	ug/l	3.51	50.00	85 - 115	90 - 110	
88 Sr	51.970	ug/l	2.39	50.00	85 - 115	90 - 110	
95 Mo	51.280	ug/l	2.33	50.00	85 - 115	90 - 110	
97 Mo	51.870	ug/l	1.42	50.00	85 - 115	90 - 110	
98 Mo	51.080	ug/l	2.70	50.00	85 - 115	90 - 110	
107 Ag	20.880	ug/l	0.31	20.00	85 - 115	90 - 110	
109 Ag	20.720	ug/l	0.59	20.00	85 - 115	90 - 110	
111 Cd	50.410	ug/l	2.77	50.00	85 - 115	90 - 110	
114 Cd	51.040	ug/l	2.10	50.00	85 - 115	90 - 110	
118 Sn	52.410	ug/l	2.12	50.00	85 - 115	90 - 110	
121 Sb	50.740	ug/l	1.29	50.00	85 - 115	90 - 110	
123 Sb	51.270	ug/l	1.44	50.00	85 - 115	90 - 110	
135 Ba	54.520	ug/l	0.99	50.00	85 - 115	90 - 110	
137 Ba	53.530	ug/l	2.35	50.00	85 - 115	90 - 110	
139 La	51.830	ug/l	2.91	50.00	85 - 115	90 - 110	
140 Ce	50.750	ug/l	1.66	50.00	85 - 115	90 - 110	
199 Hg	1.132	ug/l	3.63	1.00	85 - 115	90 - 110	>10%
200 Hg	1.113	ug/l	1.93	1.00	85 - 115	90 - 110	>10%
202 Hg	1.114	ug/l	2.19	1.00	85 - 115	90 - 110	>10%
203 Tl	51.070	ug/l	1.39	50.00	85 - 115	90 - 110	
205 Tl	49.990	ug/l	1.94	50.00	85 - 115	90 - 110	
206 Pb	51.940	ug/l	1.20	50.00	85 - 115	90 - 110	
207 Pb	51.330	ug/l	2.65	50.00	85 - 115	90 - 110	
208 Pb	51.440	ug/l	1.69	50.00	85 - 115	90 - 110	
232 Th	48.950	ug/l	1.64	50.00	85 - 115	90 - 110	
238 U	51.690	ug/l	1.89	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1049353.10	0.80	1107761.60	94.7	60 - 125	
72 Ge	1384068.10	1.83	1463530.60	94.6	60 - 125	
89 Y	1899603.80	1.28	1932167.40	98.3	60 - 125	
115 In	1833843.10	1.00	1952569.30	93.9	60 - 125	
209 Bi	4373768.00	1.05	4087579.80	107.0	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

QC Range 1
1 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
8 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00848

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\078SMPL.D\078SMPL.D#
Date Acquired: Feb 6 2018 05:55 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.209	0.209	ug/l	13.66	4500.00	872.22		P
11 B	3.281	3.281	ug/l	8.31	4500.00	6940.00		P
27 Al	58.800	58.800	ug/l	4.36	4500.00	300953.91		M
47 Ti	1.925	1.925	ug/l	19.02	4500.00	1243.33		P
51 V	0.085	0.085	ug/l	38.81	4500.00	3675.10		P
52 Cr	1.946	1.946	ug/l	3.96	4500.00	25500.00		P
53 Cr	2.842	2.842	ug/l	8.16	4500.00	2990.00		P
55 Mn	1.875	1.875	ug/l	7.08	4500.00	17493.33		P
57 Fe	68.440	68.440	ug/l	0.45	4500.00	41213.33		P
59 Co	0.047	0.047	ug/l	66.99	4500.00	2626.67		P
60 Ni	0.505	0.505	ug/l	95.96	4500.00	1323.33		P
62 Ni	-0.128	-0.128	ug/l	101.10	4500.00	370.00		P
63 Cu	0.170	0.170	ug/l	12.31	4500.00	2190.00		P
65 Cu	0.115	0.115	ug/l	55.32	4500.00	883.33		P
66 Zn	1.170	1.170	ug/l	22.97	4500.00	1956.19		P
75 As	0.179	0.179	ug/l	51.42	4500.00	769.80		P
77 Se	1.325	1.325	ug/l	23.54	4500.00	256.33		P
79 Br	0.165	0.165	ug/l	---	#VALUE!	693.33		P
82 Se	0.239	0.239	ug/l	85.07	4500.00	76.47		P
88 Sr	0.839	0.839	ug/l	5.89	4500.00	10126.67		P
95 Mo	0.201	0.201	ug/l	49.51	4500.00	916.67		P
97 Mo	0.203	0.203	ug/l	43.81	4500.00	623.33		P
98 Mo	0.281	0.281	ug/l	21.01	4500.00	1725.47		P
107 Ag	0.349	0.349	ug/l	9.99	1800.00	2512.22		P
109 Ag	0.369	0.369	ug/l	6.07	1800.00	2457.78		P
111 Cd	0.297	0.297	ug/l	16.33	4500.00	1271.16		P
114 Cd	0.303	0.303	ug/l	14.70	4500.00	1069.06		P
118 Sn	0.411	0.411	ug/l	27.93	4500.00	2833.33		P
121 Sb	0.048	0.048	ug/l	8.32	4500.00	1116.33		P
123 Sb	0.057	0.057	ug/l	16.29	4500.00	893.67		P
135 Ba	1.075	1.075	ug/l	18.75	4500.00	1193.33		P
137 Ba	0.973	0.973	ug/l	3.43	4500.00	1916.67		P
139 La	0.095	0.095	ug/l	7.50	4500.00	1983.33		P
140 Ce	0.149	0.149	ug/l	6.00	4500.00	2806.67		P
199 Hg	0.074	0.074	ug/l	25.36	450.00	193.00		P
200 Hg	0.078	0.078	ug/l	16.91	450.00	249.67		P
202 Hg	0.072	0.072	ug/l	6.55	450.00	292.67		P
203 Tl	0.105	0.105	ug/l	13.31	4500.00	1880.00		P
205 Tl	0.121	0.121	ug/l	9.03	4500.00	4273.33		P
206 Pb	0.780	0.780	ug/l	1.55	4500.00	4326.67		P
207 Pb	0.781	0.781	ug/l	4.91	4500.00	4033.33		P
208 Pb	0.789	0.789	ug/l	5.09	4500.00	17953.33		P
232 Th	0.146	0.146	ug/l	9.30	4500.00	10137.78		P
238 U	-0.027	-0.027	ug/l	68.55	4500.00	3230.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1051823.10	3.25	1107761.60	95.0	60.000002	-	125
72 Ge	1376884.40	1.59	1463530.60	94.1	60.000002	-	125
89 Y	1888087.50	1.27	1932167.40	97.7	60.000002	-	125
115 In	1839174.30	3.10	1952569.30	94.2	60.000002	-	125
209 Bi	4478362.50	1.26	4087579.80	109.6	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00849

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\079_CCB.D\079_CCB.D#
Date Acquired: Feb 6 2018 05:58 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:13 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	0.023	ug/l	88.93	0.09	
11 B	1.543	ug/l	11.08	1.18	Fail
27 Al	42.040	ug/l	4.10	0.38	Fail
47 Ti	1.189	ug/l	2.29	0.17	Fail
51 V	0.079	ug/l	124.78	0.09	
52 Cr	1.273	ug/l	2.35	0.12	Fail
53 Cr	1.510	ug/l	17.90	0.13	Fail
55 Mn	1.236	ug/l	2.11	0.14	Fail
57 Fe	47.200	ug/l	12.05	4.00	Fail
59 Co	-0.089	ug/l	23.95	0.04	
60 Ni	0.032	ug/l	246.70	0.08	
62 Ni	-0.542	ug/l	11.81	0.32	
63 Cu	-0.002	ug/l	1387.00	0.09	
65 Cu	-0.001	ug/l	1972.50	0.22	
66 Zn	0.558	ug/l	18.66	0.10	Fail
75 As	0.048	ug/l	71.82	0.12	
77 Se	0.466	ug/l	33.74	1.22	
79 Br	0.253	ug/l	131.61	#VALUE!	
82 Se	-0.060	ug/l	152.01	0.32	
88 Sr	0.472	ug/l	2.98	0.05	Fail
95 Mo	-0.029	ug/l	83.19	0.05	
97 Mo	-0.060	ug/l	91.56	0.03	
98 Mo	-0.057	ug/l	128.06	0.03	
107 Ag	0.095	ug/l	9.91	0.09	Fail
109 Ag	0.093	ug/l	19.59	0.10	
111 Cd	0.077	ug/l	55.07	0.03	Fail
114 Cd	0.125	ug/l	5.67	0.03	Fail
118 Sn	-0.022	ug/l	226.26	0.05	
121 Sb	-0.045	ug/l	14.45	0.03	
123 Sb	-0.048	ug/l	22.89	0.04	
135 Ba	0.681	ug/l	12.54	0.09	Fail
137 Ba	0.633	ug/l	6.28	0.08	Fail
139 La	0.047	ug/l	11.75	0.02	Fail
140 Ce	0.081	ug/l	3.84	0.02	Fail
199 Hg	0.064	ug/l	11.59	0.03	Fail
200 Hg	0.051	ug/l	32.00	0.03	Fail
202 Hg	0.058	ug/l	11.69	0.03	Fail
203 Tl	0.020	ug/l	70.67	0.03	
205 Tl	0.059	ug/l	17.11	0.02	Fail
206 Pb	0.379	ug/l	5.52	#VALUE!	
207 Pb	0.380	ug/l	15.64	#VALUE!	
208 Pb	0.394	ug/l	4.51	0.02	Fail
232 Th	-0.111	ug/l	5.21	0.06	
238 U	-0.105	ug/l	10.03	0.02	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1040016.10	2.65	1107761.60	93.9	60 - 125	
72 Ge	1385011.50	2.13	1463530.60	94.6	60 - 125	
89 Y	1900320.00	1.15	1932167.40	98.4	60 - 125	
115 In	1835006.40	1.02	1952569.30	94.0	60 - 125	
209 Bi	4447182.00	0.81	4087579.80	108.8	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

21 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\080SMPL.D\080SMPL.D#
Date Acquired: Feb 6 2018 06:01 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020223-002AMS3
Misc Info: 6010.20-S
Vial Number: 1211
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	403.400	80.680	ug/l	0.31	4500.00	161845.59		P
11 B	1,029.000	205.800	ug/l	1.19	4500.00	239713.30		P
27 Al	398,000.000	79600.000	ug/l	1.99	4500.00	###########		A
47 Ti	16,095.000	3219.000	ug/l	1.17	4500.00	1658504.00		A
51 V	1,500.500	300.100	ug/l	0.69	4500.00	2129080.00		A
52 Cr	1,166.500	233.300	ug/l	2.49	4500.00	1440479.00		A
53 Cr	1,396.500	279.300	ug/l	2.22	4500.00	198040.00		P
55 Mn	14,450.000	2890.000	ug/l	1.48	4500.00	22046890.00		A
57 Fe	377,950.000	75590.000	ug/l	0.92	4500.00	12838350.00		A
59 Co	1,041.500	208.300	ug/l	0.41	4500.00	1483185.00		A
60 Ni	1,141.500	228.300	ug/l	0.13	4500.00	371796.69		P
62 Ni	1,145.500	229.100	ug/l	1.23	4500.00	56090.00		P
63 Cu	1,239.000	247.800	ug/l	1.39	4500.00	987350.00		A
65 Cu	1,232.500	246.500	ug/l	1.09	4500.00	469553.31		P
66 Zn	1,935.000	387.000	ug/l	0.98	4500.00	458438.19		P
75 As	891.500	178.300	ug/l	0.41	4500.00	262810.69		P
77 Se	1,173.000	234.600	ug/l	1.88	4500.00	19825.33		P
79 Br	86.900	17.380	ug/l	---	#VALUE!	4440.00		P
82 Se	813.500	162.700	ug/l	0.42	4500.00	18151.40		P
88 Sr	1,995.000	399.000	ug/l	2.24	4500.00	3924629.00		A
95 Mo	750.000	150.000	ug/l	2.28	4500.00	274180.00		P
97 Mo	747.500	149.500	ug/l	1.42	4500.00	168946.70		P
98 Mo	743.500	148.700	ug/l	1.82	4500.00	432768.50		P
107 Ag	483.050	96.610	ug/l	1.36	1800.00	472164.41		P
109 Ag	479.800	95.960	ug/l	1.38	1800.00	450551.09		P
111 Cd	446.300	89.260	ug/l	1.48	4500.00	106447.50		P
114 Cd	431.100	86.220	ug/l	1.21	4500.00	229386.41		P
118 Sn	872.000	174.400	ug/l	1.13	4500.00	512823.31		P
121 Sb	222.150	44.430	ug/l	0.96	4500.00	204685.00		P
123 Sb	230.100	46.020	ug/l	0.93	4500.00	164119.00		P
135 Ba	5,010.000	1002.000	ug/l	0.78	4500.00	892395.38		A
137 Ba	5,005.000	1001.000	ug/l	1.99	4500.00	1574898.00		A
139 La	1,548.000	309.600	ug/l	0.97	4500.00	4668878.00		A
140 Ce	2,075.000	415.000	ug/l	0.93	4500.00	6062979.00		A
199 Hg	0.576	0.115	ug/l	30.29	450.00	223.33		P
200 Hg	0.601	0.120	ug/l	26.43	450.00	293.33		P
202 Hg	0.606	0.121	ug/l	9.57	450.00	368.67		P
203 Tl	884.500	176.900	ug/l	3.80	4500.00	901410.00		P
205 Tl	870.500	174.100	ug/l	3.59	4500.00	2181221.00		A
206 Pb	1,104.000	220.800	ug/l	3.90	4500.00	903070.00		P
207 Pb	1,090.000	218.000	ug/l	3.28	4500.00	810913.31		P
208 Pb	1,089.000	217.800	ug/l	3.13	4500.00	3666911.00		A
232 Th	1,088.000	217.600	ug/l	4.17	4500.00	3829919.00		A
238 U	917.500	183.500	ug/l	2.55	4500.00	3416970.00		A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1142708.50	0.90	1107761.60	103.2	60.000002	-	125
72 Ge	1327157.80	1.25	1463530.60	90.7	60.000002	-	125
89 Y	2657226.30	0.22	1932167.40	137.5	60.000002	-	125
115 In	1702599.60	1.44	1952569.30	87.2	60.000002	-	125
209 Bi	4093409.30	3.70	4087579.80	100.1	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00851

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\081SMPL.D\081SMPL.D#
Date Acquired: Feb 6 2018 06:03 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020223-002AMSD3
Misc Info: 6010.20-S
Vial Number: 1212
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	462.850	92.570	ug/l	0.47	4500.00	189915.59		P
11 B	1,165.000	233.000	ug/l	0.35	4500.00	277204.41		P
27 Al	466,300.000	93260.000	ug/l	1.99	4500.00	###########		A
47 Ti	19,340.000	3868.000	ug/l	2.11	4500.00	2004778.00		A
51 V	1,748.000	349.600	ug/l	3.30	4500.00	2493973.00		A
52 Cr	1,376.500	275.300	ug/l	2.86	4500.00	1707680.00		A
53 Cr	1,593.500	318.700	ug/l	2.42	4500.00	227233.30		P
55 Mn	17,585.000	3517.000	ug/l	1.85	4500.00	26989890.00		A
57 Fe	444,600.000	88920.000	ug/l	2.12	4500.00	15192770.00		A
59 Co	1,215.000	243.000	ug/l	2.98	4500.00	1740257.00		A
60 Ni	1,351.000	270.200	ug/l	1.75	4500.00	442676.00		M
62 Ni	1,348.000	269.600	ug/l	3.95	4500.00	66326.66		P
63 Cu	1,442.500	288.500	ug/l	2.69	4500.00	1156037.00		A
65 Cu	1,435.500	287.100	ug/l	1.82	4500.00	550170.00		P
66 Zn	2,201.500	440.300	ug/l	2.06	4500.00	524727.88		P
75 As	1,027.500	205.500	ug/l	2.05	4500.00	304732.00		P
77 Se	1,283.000	256.600	ug/l	2.27	4500.00	21802.00		P
79 Br	87.100	17.420	ug/l	---	#VALUE!	4476.67		P
82 Se	931.500	186.300	ug/l	2.30	4500.00	20913.73		P
88 Sr	2,349.000	469.800	ug/l	3.11	4500.00	4649052.00		A
95 Mo	886.000	177.200	ug/l	1.01	4500.00	322620.00		P
97 Mo	884.500	176.900	ug/l	1.33	4500.00	199033.30		P
98 Mo	878.500	175.700	ug/l	1.35	4500.00	509157.81		P
107 Ag	540.500	108.100	ug/l	0.62	1800.00	526608.88		P
109 Ag	535.500	107.100	ug/l	0.74	1800.00	501122.19		P
111 Cd	509.000	101.800	ug/l	0.89	4500.00	120871.30		P
114 Cd	496.700	99.340	ug/l	0.40	4500.00	263294.19		P
118 Sn	1,032.000	206.400	ug/l	0.69	4500.00	604316.69		P
121 Sb	259.950	51.990	ug/l	0.18	4500.00	238489.70		P
123 Sb	268.400	53.680	ug/l	0.53	4500.00	190624.70		P
135 Ba	6,100.000	1220.000	ug/l	0.88	4500.00	1082103.00		A
137 Ba	6,005.000	1201.000	ug/l	0.74	4500.00	1882604.00		A
139 La	1,545.000	309.000	ug/l	1.31	4500.00	4641951.00		A
140 Ce	2,057.000	411.400	ug/l	0.26	4500.00	5988722.00		A
199 Hg	0.554	0.111	ug/l	13.41	450.00	221.33		P
200 Hg	0.613	0.123	ug/l	3.68	450.00	301.00		P
202 Hg	0.567	0.113	ug/l	6.06	450.00	356.33		P
203 Tl	992.500	198.500	ug/l	1.60	4500.00	1021750.00		A
205 Tl	975.500	195.100	ug/l	1.01	4500.00	2469658.00		A
206 Pb	1,245.000	249.000	ug/l	2.25	4500.00	1028321.00		A
207 Pb	1,227.500	245.500	ug/l	1.47	4500.00	922380.00		P
208 Pb	1,231.500	246.300	ug/l	1.64	4500.00	4188742.00		A
232 Th	1,188.000	237.600	ug/l	1.87	4500.00	4223328.00		A
238 U	1,059.500	211.900	ug/l	0.72	4500.00	3984887.00		A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1169149.30	0.26	1107761.60	105.5	60.000002	-	125
72 Ge	1335678.10	2.47	1463530.60	91.3	60.000002	-	125
89 Y	2527316.80	0.92	1932167.40	130.8	60.000002	-	125
115 In	1696194.00	0.99	1952569.30	86.9	60.000002	-	125
209 Bi	4131909.80	1.25	4087579.80	101.1	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00852

Sample QC Report ICPMS202-B

Data File:	C:\ICPCHEM\1\DATA\18B06o00.B\082SMPL.D\082SMPL.D#
Date Acquired:	Feb 6 2018 06:06 pm
Acq. Method:	208CLdsa.M
Operator:	JPV
Sample Name:	Rinse
Misc Info:	ICPMS-200.8-W-D
Vial Number:	1
Current Method:	C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File:	C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update:	Feb 06 2018 03:13 pm
Sample Type:	Sample
Dilution Factor:	1.00
Autodil Factor:	Undiluted
Final Dil Factor:	1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.027	0.027	ug/l	36.35	4500.00	547.78		P
11 B	1.267	1.267	ug/l	8.64	4500.00	4918.89		P
27 Al	122.100	122.100	ug/l	11.16	4500.00	630794.81		A
47 Ti	4.438	4.438	ug/l	6.32	4500.00	2663.33		P
51 V	0.209	0.209	ug/l	17.21	4500.00	4725.58		P
52 Cr	0.606	0.606	ug/l	22.65	4500.00	17506.66		P
53 Cr	1.863	1.863	ug/l	12.25	4500.00	2343.33		P
55 Mn	3.898	3.898	ug/l	11.65	4500.00	34500.00		P
57 Fe	120.600	120.600	ug/l	12.99	4500.00	51926.66		P
59 Co	0.151	0.151	ug/l	42.80	4500.00	3496.67		P
60 Ni	0.326	0.326	ug/l	21.64	4500.00	1043.33		P
62 Ni	0.201	0.201	ug/l	100.40	4500.00	466.67		P
63 Cu	0.240	0.240	ug/l	10.83	4500.00	2553.33		P
65 Cu	0.314	0.314	ug/l	16.17	4500.00	1316.67		P
66 Zn	0.764	0.764	ug/l	21.98	4500.00	1502.72		P
75 As	0.292	0.292	ug/l	11.28	4500.00	972.85		P
77 Se	1.934	1.934	ug/l	26.13	4500.00	318.33		P
79 Br	0.283	0.283	ug/l	---	#VALUE!	743.33		P
82 Se	0.560	0.560	ug/l	16.66	4500.00	116.73		P
88 Sr	0.659	0.659	ug/l	14.11	4500.00	8536.67		P
95 Mo	0.303	0.303	ug/l	20.05	4500.00	1146.67		P
97 Mo	0.335	0.335	ug/l	4.38	4500.00	803.33		P
98 Mo	0.245	0.245	ug/l	16.84	4500.00	1648.47		P
107 Ag	0.196	0.196	ug/l	15.58	1800.00	1748.89		P
109 Ag	0.219	0.219	ug/l	4.40	1800.00	1742.22		P
111 Cd	0.082	0.082	ug/l	125.79	4500.00	1021.35		P
114 Cd	0.128	0.128	ug/l	21.90	4500.00	579.04		P
118 Sn	0.040	0.040	ug/l	22.73	4500.00	1700.00		P
121 Sb	0.006	0.006	ug/l	74.04	4500.00	932.33		P
123 Sb	0.019	0.019	ug/l	38.61	4500.00	764.33		P
135 Ba	1.363	1.363	ug/l	9.63	4500.00	1510.00		P
137 Ba	1.389	1.389	ug/l	6.72	4500.00	2683.33		P
139 La	0.310	0.310	ug/l	15.06	4500.00	5586.67		P
140 Ce	0.445	0.445	ug/l	24.42	4500.00	7630.00		P
199 Hg	-0.016	-0.016	ug/l	38.77	450.00	79.67		P
200 Hg	-0.004	-0.004	ug/l	184.15	450.00	106.33		P
202 Hg	-0.007	-0.007	ug/l	50.63	450.00	111.67		P
203 Tl	0.273	0.273	ug/l	4.52	4500.00	2810.00		P
205 Tl	0.334	0.334	ug/l	14.44	4500.00	7173.33		P
206 Pb	0.756	0.756	ug/l	13.00	4500.00	4206.67		P
207 Pb	0.702	0.702	ug/l	9.07	4500.00	3703.33		P
208 Pb	0.729	0.729	ug/l	2.66	4500.00	16803.33		P
232 Th	0.368	0.368	ug/l	21.74	4500.00	14364.44		P
238 U	0.119	0.119	ug/l	28.24	4500.00	6196.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1073575.10	1.54	1107761.60	96.9	60.000002	-	125
72 Ge	1420233.30	2.63	1463530.60	97.0	60.000002	-	125
89 Y	1938440.90	1.25	1932167.40	100.3	60.000002	-	125
115 In	1882135.80	2.16	1952569.30	96.4	60.000002	-	125
209 Bi	4468574.00	1.19	4087579.80	109.3	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00853

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\083SMPL.D\083SMPL.D#
Date Acquired: Feb 6 2018 06:09 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.009	-0.009	ug/l	312.55	4500.00	475.56		P
11 B	0.661	0.661	ug/l	2.46	4500.00	4226.67		P
27 Al	66.250	66.250	ug/l	4.01	4500.00	342009.41		A
47 Ti	2.222	2.222	ug/l	3.70	4500.00	1443.33		P
51 V	0.140	0.140	ug/l	55.80	4500.00	4193.12		P
52 Cr	0.337	0.337	ug/l	18.28	4500.00	15753.33		P
53 Cr	0.887	0.887	ug/l	23.06	4500.00	1610.00		P
55 Mn	2.212	2.212	ug/l	2.58	4500.00	20793.33		P
57 Fe	73.770	73.770	ug/l	7.27	4500.00	43443.33		P
59 Co	0.024	0.024	ug/l	108.67	4500.00	2536.67		P
60 Ni	0.198	0.198	ug/l	13.00	4500.00	823.33		P
62 Ni	-0.208	-0.208	ug/l	50.24	4500.00	360.00		P
63 Cu	0.059	0.059	ug/l	56.09	4500.00	1783.33		P
65 Cu	0.043	0.043	ug/l	20.71	4500.00	766.67		P
66 Zn	0.463	0.463	ug/l	12.85	4500.00	1126.24		P
75 As	0.092	0.092	ug/l	28.12	4500.00	658.02		P
77 Se	1.173	1.173	ug/l	13.21	4500.00	250.67		P
79 Br	-0.008	-0.008	ug/l	---	#VALUE!	673.33		P
82 Se	0.184	0.184	ug/l	41.75	4500.00	72.07		P
88 Sr	0.363	0.363	ug/l	2.05	4500.00	5440.00		P
95 Mo	-0.004	-0.004	ug/l	950.25	4500.00	526.67		P
97 Mo	-0.081	-0.081	ug/l	78.15	4500.00	283.33		P
98 Mo	0.014	0.014	ug/l	291.01	4500.00	902.29		P
107 Ag	0.063	0.063	ug/l	11.23	1800.00	1027.78		P
109 Ag	0.065	0.065	ug/l	17.08	1800.00	934.44		P
111 Cd	0.017	0.017	ug/l	312.88	4500.00	929.04		P
114 Cd	0.079	0.079	ug/l	17.82	4500.00	433.59		P
118 Sn	-0.153	-0.153	ug/l	6.89	4500.00	1070.00		P
121 Sb	-0.060	-0.060	ug/l	6.60	4500.00	589.00		P
123 Sb	-0.062	-0.062	ug/l	5.38	4500.00	445.00		P
135 Ba	0.714	0.714	ug/l	11.84	4500.00	863.33		P
137 Ba	0.714	0.714	ug/l	3.46	4500.00	1503.33		P
139 La	0.163	0.163	ug/l	8.37	4500.00	3133.33		P
140 Ce	0.232	0.232	ug/l	6.92	4500.00	4180.00		P
199 Hg	-0.005	-0.005	ug/l	159.29	450.00	94.00		P
200 Hg	-0.004	-0.004	ug/l	57.93	450.00	107.33		P
202 Hg	0.003	0.003	ug/l	142.38	450.00	136.00		P
203 Tl	0.134	0.134	ug/l	24.27	4500.00	2043.33		P
205 Tl	0.143	0.143	ug/l	11.84	4500.00	4583.33		P
206 Pb	0.735	0.735	ug/l	2.98	4500.00	4130.00		P
207 Pb	0.695	0.695	ug/l	6.12	4500.00	3690.00		P
208 Pb	0.742	0.742	ug/l	4.49	4500.00	17103.33		P
232 Th	-0.011	-0.011	ug/l	159.17	4500.00	7127.78		P
238 U	0.010	0.010	ug/l	46.68	4500.00	3990.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1063061.80	1.18	1107761.60	96.0	60.000002	-	125
72 Ge	1419645.30	2.54	1463530.60	97.0	60.000002	-	125
89 Y	1948286.10	0.85	1932167.40	100.8	60.000002	-	125
115 In	1870543.90	1.79	1952569.30	95.8	60.000002	-	125
209 Bi	4484110.50	0.25	4087579.80	109.7	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00854

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\084SMPL.D\084SMPL.D#
Date Acquired: Feb 6 2018 06:11 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: MB-118169
Misc Info: 6010.20-S
Vial Number: 1213
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 2.00
Autodil Factor: Undiluted
Final Dil Factor: 2.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.146	-0.073	ug/l	48.48	4500.00	352.22		P
11 B	2.250	1.125	ug/l	8.35	4500.00	4652.22		P
27 Al	90.240	45.120	ug/l	5.09	4500.00	231420.00		P
47 Ti	3.950	1.975	ug/l	15.45	4500.00	1223.33		P
51 V	0.849	0.424	ug/l	165.00	4500.00	6010.67		P
52 Cr	10.834	5.417	ug/l	12.38	4500.00	45880.00		P
53 Cr	231.400	115.700	ug/l	3.43	4500.00	82690.00		P
55 Mn	3.028	1.514	ug/l	3.28	4500.00	14146.67		P
57 Fe	130.720	65.360	ug/l	7.59	4500.00	39283.33		P
59 Co	-0.249	-0.125	ug/l	7.02	4500.00	1316.67		P
60 Ni	0.506	0.253	ug/l	25.32	4500.00	860.00		P
62 Ni	0.311	0.155	ug/l	101.16	4500.00	426.67		P
63 Cu	0.714	0.357	ug/l	1.46	4500.00	2860.00		P
65 Cu	0.733	0.367	ug/l	46.63	4500.00	1336.67		P
66 Zn	2.870	1.435	ug/l	5.54	4500.00	2206.14		P
75 As	-1.081	-0.540	ug/l	91.27	4500.00	-323.97		P
77 Se	340.600	170.300	ug/l	2.14	4500.00	14466.00		P
79 Br	22.080	11.040	ug/l	---	#VALUE!	3060.00		P
82 Se	0.510	0.255	ug/l	37.92	4500.00	75.40		P
88 Sr	0.401	0.201	ug/l	7.96	4500.00	3493.33		P
95 Mo	0.235	0.118	ug/l	35.13	4500.00	713.33		P
97 Mo	0.188	0.094	ug/l	2.34	4500.00	463.33		P
98 Mo	0.207	0.103	ug/l	27.63	4500.00	1100.83		P
107 Ag	0.887	0.443	ug/l	43.00	1800.00	2826.67		P
109 Ag	0.826	0.413	ug/l	43.48	1800.00	2513.33		P
111 Cd	-0.235	-0.118	ug/l	8.72	4500.00	699.70		P
114 Cd	-0.347	-0.174	ug/l	16.34	4500.00	-282.48		P
118 Sn	23.160	11.580	ug/l	0.51	4500.00	36030.00		P
121 Sb	0.044	0.022	ug/l	12.22	4500.00	931.67		P
123 Sb	0.070	0.035	ug/l	35.69	4500.00	762.00		P
135 Ba	1.151	0.575	ug/l	16.01	4500.00	676.67		P
137 Ba	0.980	0.490	ug/l	9.72	4500.00	1033.33		P
139 La	0.255	0.128	ug/l	14.89	4500.00	2356.67		P
140 Ce	0.258	0.129	ug/l	7.11	4500.00	2346.67		P
199 Hg	0.016	0.008	ug/l	28.97	450.00	102.33		P
200 Hg	0.033	0.016	ug/l	26.19	450.00	132.67		P
202 Hg	0.040	0.020	ug/l	10.43	450.00	162.33		P
203 Tl	0.135	0.067	ug/l	111.40	4500.00	1553.33		P
205 Tl	0.219	0.110	ug/l	48.00	4500.00	3826.67		P
206 Pb	0.566	0.283	ug/l	29.36	4500.00	1956.67		P
207 Pb	0.573	0.287	ug/l	14.67	4500.00	1883.33		P
208 Pb	0.603	0.302	ug/l	24.18	4500.00	8346.67		P
232 Th	4.938	2.469	ug/l	7.46	4500.00	51063.33		P
238 U	-0.115	-0.057	ug/l	9.19	4500.00	2443.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1047364.40	1.07	1107761.60	94.5	60.000002	-	125
72 Ge	1330214.40	1.70	1463530.60	90.9	60.000002	-	125
89 Y	1811469.90	2.27	1932167.40	93.8	60.000002	-	125
115 In	1733789.50	2.87	1952569.30	88.8	60.000002	-	125
209 Bi	4174207.30	2.07	4087579.80	102.1	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00855

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\085SMPL.D\085SMPL.D#
Date Acquired: Feb 6 2018 06:14 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020067-001B
Misc Info: 6010.20-S
Vial Number: 1215
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	4.554	0.911	ug/l	3.14	4500.00	2214.44		P
11 B	20.710	4.142	ug/l	2.01	4500.00	8035.56		P
27 Al	67,750.000	13550.000	ug/l	2.77	4500.00	69568448.00		A
47 Ti	790.000	158.000	ug/l	2.31	4500.00	82976.67		P
51 V	137.000	27.400	ug/l	1.44	4500.00	200316.41		P
52 Cr	60.650	12.130	ug/l	3.32	4500.00	88363.33		P
53 Cr	278.250	55.650	ug/l	4.22	4500.00	40833.33		P
55 Mn	1,075.500	215.100	ug/l	3.02	4500.00	1670588.00		A
57 Fe	93,950.000	18790.000	ug/l	2.22	4500.00	3266835.00		A
59 Co	36.160	7.232	ug/l	2.29	4500.00	54516.66		P
60 Ni	58.350	11.670	ug/l	2.27	4500.00	19760.00		P
62 Ni	53.600	10.720	ug/l	7.45	4500.00	3046.67		P
63 Cu	30.110	6.022	ug/l	2.43	4500.00	25820.00		P
65 Cu	30.315	6.063	ug/l	2.13	4500.00	12380.00		P
66 Zn	199.500	39.900	ug/l	1.48	4500.00	48516.96		P
75 As	21.195	4.239	ug/l	6.30	4500.00	6835.45		P
77 Se	335.900	67.180	ug/l	4.14	4500.00	5869.67		P
79 Br	26.345	5.269	ug/l	---	#VALUE!	1816.67		P
82 Se	1.344	0.269	ug/l	111.46	4500.00	78.53		P
88 Sr	247.350	49.470	ug/l	1.31	4500.00	496143.31		P
95 Mo	1.605	0.321	ug/l	13.84	4500.00	1083.33		P
97 Mo	1.406	0.281	ug/l	3.43	4500.00	673.33		P
98 Mo	1.345	0.269	ug/l	14.60	4500.00	1578.81		P
107 Ag	0.472	0.094	ug/l	7.83	1800.00	1098.89		P
109 Ag	0.291	0.058	ug/l	20.36	1800.00	827.78		P
111 Cd	1.049	0.210	ug/l	18.17	4500.00	1086.37		P
114 Cd	-0.606	-0.121	ug/l	25.06	4500.00	-139.09		P
118 Sn	23.565	4.713	ug/l	5.12	4500.00	15406.67		P
121 Sb	0.074	0.015	ug/l	49.46	4500.00	891.00		P
123 Sb	0.147	0.029	ug/l	3.95	4500.00	736.00		P
135 Ba	1,007.000	201.400	ug/l	1.09	4500.00	181250.00		P
137 Ba	997.000	199.400	ug/l	1.58	4500.00	317366.59		P
139 La	161.650	32.330	ug/l	1.48	4500.00	492980.00		P
140 Ce	334.250	66.850	ug/l	0.43	4500.00	987500.81		A
199 Hg	0.062	0.012	ug/l	45.85	450.00	107.67		P
200 Hg	0.136	0.027	ug/l	20.18	450.00	150.00		P
202 Hg	0.101	0.020	ug/l	20.63	450.00	162.67		P
203 Tl	0.383	0.077	ug/l	52.39	4500.00	1603.33		P
205 Tl	0.449	0.090	ug/l	3.76	4500.00	3580.00		P
206 Pb	63.700	12.740	ug/l	1.58	4500.00	53836.66		P
207 Pb	56.900	11.380	ug/l	2.48	4500.00	43920.00		P
208 Pb	59.500	11.900	ug/l	2.06	4500.00	207206.70		P
232 Th	37.580	7.516	ug/l	1.54	4500.00	141515.59		P
238 U	5.210	1.042	ug/l	5.07	4500.00	23273.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1076092.30	1.11	1107761.60	97.1	60.000002	-	125
72 Ge	1349653.00	1.78	1463530.60	92.2	60.000002	-	125
89 Y	1961517.00	0.62	1932167.40	101.5	60.000002	-	125
115 In	1720613.80	1.91	1952569.30	88.1	60.000002	-	125
209 Bi	4170383.50	1.42	4087579.80	102.0	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00856

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\086SMPL.D\086SMPL.D#
Date Acquired: Feb 6 2018 06:17 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020067-002B
Misc Info: 6010.20-S
Vial Number: 1301
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	2.936	0.587	ug/l	11.48	4500.00	1542.22		P
11 B	24.640	4.928	ug/l	6.51	4500.00	8545.55		P
27 Al	41,585.000	8317.000	ug/l	4.33	4500.00	41065420.00		A
47 Ti	1,401.500	280.300	ug/l	1.74	4500.00	145776.70		P
51 V	142.900	28.580	ug/l	2.10	4500.00	207011.41		P
52 Cr	45.045	9.009	ug/l	2.71	4500.00	68330.00		P
53 Cr	300.850	60.170	ug/l	2.54	4500.00	43693.33		P
55 Mn	1,369.500	273.900	ug/l	2.90	4500.00	2107403.00		A
57 Fe	111,300.000	22260.000	ug/l	2.44	4500.00	3830245.00		A
59 Co	37.795	7.559	ug/l	0.20	4500.00	56400.00		P
60 Ni	44.220	8.844	ug/l	1.60	4500.00	14950.00		P
62 Ni	41.565	8.313	ug/l	15.72	4500.00	2423.33		P
63 Cu	27.775	5.555	ug/l	3.69	4500.00	23713.33		P
65 Cu	28.400	5.680	ug/l	2.75	4500.00	11540.00		P
66 Zn	212.700	42.540	ug/l	3.94	4500.00	51229.18		P
75 As	22.570	4.514	ug/l	3.24	4500.00	7183.85		P
77 Se	381.250	76.250	ug/l	3.18	4500.00	6585.67		P
79 Br	23.675	4.735	ug/l	---	#VALUE!	1683.33		P
82 Se	2.619	0.524	ug/l	19.63	4500.00	106.27		P
88 Sr	320.450	64.090	ug/l	3.47	4500.00	636483.31		P
95 Mo	3.629	0.726	ug/l	7.37	4500.00	1840.00		P
97 Mo	3.669	0.734	ug/l	3.64	4500.00	1196.67		P
98 Mo	3.508	0.702	ug/l	13.47	4500.00	2864.72		P
107 Ag	0.148	0.030	ug/l	83.77	1800.00	783.33		P
109 Ag	0.097	0.019	ug/l	59.72	1800.00	648.89		P
111 Cd	1.302	0.260	ug/l	10.65	4500.00	1154.04		P
114 Cd	-0.341	-0.068	ug/l	4.36	4500.00	3.99		P
118 Sn	22.610	4.522	ug/l	4.71	4500.00	14930.00		P
121 Sb	0.207	0.041	ug/l	30.35	4500.00	1020.33		P
123 Sb	0.247	0.049	ug/l	10.74	4500.00	813.00		P
135 Ba	2,076.000	415.200	ug/l	0.57	4500.00	375903.31		P
137 Ba	2,088.000	417.600	ug/l	1.43	4500.00	668613.31		P
139 La	196.850	39.370	ug/l	0.56	4500.00	604050.00		P
140 Ce	401.450	80.290	ug/l	3.70	4500.00	1193179.00		A
199 Hg	0.116	0.023	ug/l	93.49	450.00	120.67		P
200 Hg	0.098	0.020	ug/l	33.91	450.00	138.33		P
202 Hg	0.089	0.018	ug/l	19.43	450.00	158.67		P
203 Tl	-0.026	-0.005	ug/l	359.78	4500.00	1186.67		P
205 Tl	0.060	0.012	ug/l	141.67	4500.00	2603.33		P
206 Pb	58.700	11.740	ug/l	2.59	4500.00	49970.00		P
207 Pb	52.600	10.520	ug/l	2.38	4500.00	40880.00		P
208 Pb	55.450	11.090	ug/l	2.12	4500.00	194566.70		P
232 Th	35.610	7.122	ug/l	1.96	4500.00	135187.80		P
238 U	9.840	1.968	ug/l	5.50	4500.00	41046.66		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1035966.40	3.61	1107761.60	93.5	60.000002	-	125
72 Ge	1337982.00	2.60	1463530.60	91.4	60.000002	-	125
89 Y	2064179.30	1.14	1932167.40	106.8	60.000002	-	125
115 In	1731383.10	0.85	1952569.30	88.7	60.000002	-	125
209 Bi	4194584.50	2.04	4087579.80	102.6	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00857

Sample QC Report ICPMS202-B

Data File:	C:\ICPCHEM\1\DATA\18B06o00.B\087SMPL.D\087SMPL.D#
Date Acquired:	Feb 6 2018 06:19 pm
Acq. Method:	208CLdsa.M
Operator:	JPV
Sample Name:	B18020068-001B
Misc Info:	6010.20-S
Vial Number:	1302
Current Method:	C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File:	C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update:	Feb 06 2018 03:13 pm
Sample Type:	Sample
Dilution Factor:	5.00
Autodil Factor:	Undiluted
Final Dil Factor:	5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	3.571	0.714	ug/l	4.70	4500.00	1790.00		P
11 B	25.940	5.188	ug/l	5.61	4500.00	8897.78		P
27 Al	52,450.000	10490.000	ug/l	3.16	4500.00	52293288.00		A
47 Ti	1,033.000	206.600	ug/l	1.66	4500.00	104486.70		P
51 V	138.750	27.750	ug/l	2.68	4500.00	195440.30		P
52 Cr	58.600	11.720	ug/l	3.96	4500.00	82680.00		P
53 Cr	258.850	51.770	ug/l	8.66	4500.00	36633.33		P
55 Mn	1,345.500	269.100	ug/l	3.06	4500.00	2013362.00		A
57 Fe	94,850.000	18970.000	ug/l	3.65	4500.00	3177231.00		A
59 Co	33.435	6.687	ug/l	1.91	4500.00	48733.33		P
60 Ni	53.050	10.610	ug/l	0.66	4500.00	17350.00		P
62 Ni	50.500	10.100	ug/l	8.71	4500.00	2783.33		P
63 Cu	39.235	7.847	ug/l	2.16	4500.00	31986.67		P
65 Cu	38.560	7.712	ug/l	1.81	4500.00	15003.33		P
66 Zn	238.550	47.710	ug/l	1.47	4500.00	55811.99		P
75 As	26.145	5.229	ug/l	3.36	4500.00	8009.85		P
77 Se	347.650	69.530	ug/l	5.07	4500.00	5847.67		P
79 Br	22.060	4.412	ug/l	---	#VALUE!	1566.67		P
82 Se	2.058	0.412	ug/l	64.03	4500.00	90.80		P
88 Sr	669.000	133.800	ug/l	4.22	4500.00	1290513.00		A
95 Mo	5.625	1.125	ug/l	9.08	4500.00	2546.67		P
97 Mo	5.465	1.093	ug/l	9.35	4500.00	1586.67		P
98 Mo	5.725	1.145	ug/l	3.86	4500.00	4124.57		P
107 Ag	0.084	0.017	ug/l	77.37	1800.00	711.11		P
109 Ag	0.079	0.016	ug/l	62.80	1800.00	623.33		P
111 Cd	1.118	0.224	ug/l	15.36	4500.00	1095.87		P
114 Cd	-0.360	-0.072	ug/l	25.43	4500.00	-6.54		P
118 Sn	23.030	4.606	ug/l	2.04	4500.00	14983.33		P
121 Sb	0.188	0.038	ug/l	16.99	4500.00	990.33		P
123 Sb	0.168	0.034	ug/l	30.82	4500.00	745.67		P
135 Ba	1,174.000	234.800	ug/l	2.57	4500.00	209823.30		P
137 Ba	1,169.000	233.800	ug/l	1.80	4500.00	369483.31		P
139 La	197.100	39.420	ug/l	2.15	4500.00	596900.00		P
140 Ce	423.150	84.630	ug/l	2.82	4500.00	1241319.00		A
199 Hg	0.058	0.012	ug/l	62.71	450.00	105.33		P
200 Hg	0.101	0.020	ug/l	50.25	450.00	137.00		P
202 Hg	0.084	0.017	ug/l	43.79	450.00	153.67		P
203 Tl	0.035	0.007	ug/l	236.22	4500.00	1226.67		P
205 Tl	0.227	0.045	ug/l	27.66	4500.00	2980.00		P
206 Pb	67.000	13.400	ug/l	3.55	4500.00	55913.33		P
207 Pb	58.650	11.730	ug/l	3.07	4500.00	44683.33		P
208 Pb	62.400	12.480	ug/l	2.88	4500.00	214600.00		P
232 Th	51.350	10.270	ug/l	1.89	4500.00	188590.00		P
238 U	11.135	2.227	ug/l	2.67	4500.00	45186.66		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1044882.80	1.31	1107761.60	94.3	60.000002	-	125
72 Ge	1300519.60	2.33	1463530.60	88.9	60.000002	-	125
89 Y	1976393.80	1.30	1932167.40	102.3	60.000002	-	125
115 In	1709060.00	2.14	1952569.30	87.5	60.000002	-	125
209 Bi	4120930.00	2.42	4087579.80	100.8	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00858

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\088SMPL.D\088SMPL.D#
Date Acquired: Feb 6 2018 06:22 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-002B
Misc Info: 6010.20-S
Vial Number: 1303
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	19.630	3.926	ug/l	4.39	4500.00	8213.33		P
11 B	95.700	19.140	ug/l	3.54	4500.00	25210.00		P
27 Al	334,750.000	66950.000	ug/l	2.98	4500.00	##########		A
47 Ti	713.000	142.600	ug/l	1.67	4500.00	71266.66		P
51 V	513.500	102.700	ug/l	2.38	4500.00	706464.88		A
52 Cr	272.000	54.400	ug/l	2.89	4500.00	334196.69		P
53 Cr	532.000	106.400	ug/l	2.19	4500.00	73523.33		P
55 Mn	9,810.000	1962.000	ug/l	2.48	4500.00	14477840.00		A
57 Fe	357,600.000	71520.000	ug/l	2.62	4500.00	11749670.00		A
59 Co	188.000	37.600	ug/l	2.23	4500.00	260690.00		P
60 Ni	300.750	60.150	ug/l	3.67	4500.00	95016.67		P
62 Ni	296.650	59.330	ug/l	5.38	4500.00	14323.33		P
63 Cu	243.250	48.650	ug/l	2.33	4500.00	188580.00		P
65 Cu	242.750	48.550	ug/l	0.81	4500.00	89966.67		P
66 Zn	825.000	165.000	ug/l	1.51	4500.00	189346.30		P
75 As	39.270	7.854	ug/l	6.79	4500.00	11634.47		P
77 Se	425.500	85.100	ug/l	0.44	4500.00	7041.33		P
79 Br	32.220	6.444	ug/l	---	#VALUE!	1976.67		P
82 Se	7.415	1.483	ug/l	17.90	4500.00	204.87		P
88 Sr	2,708.500	541.700	ug/l	1.95	4500.00	5153567.00		A
95 Mo	6.260	1.252	ug/l	6.00	4500.00	2690.00		P
97 Mo	6.110	1.222	ug/l	18.72	4500.00	1676.67		P
98 Mo	5.925	1.185	ug/l	6.78	4500.00	4105.13		P
107 Ag	0.740	0.148	ug/l	9.85	1800.00	1311.11		P
109 Ag	0.575	0.115	ug/l	4.91	1800.00	1055.56		P
111 Cd	3.859	0.772	ug/l	20.98	4500.00	1688.58		P
114 Cd	1.252	0.250	ug/l	16.64	4500.00	825.18		P
118 Sn	34.835	6.967	ug/l	2.32	4500.00	21216.67		P
121 Sb	1.983	0.397	ug/l	5.19	4500.00	2557.00		P
123 Sb	2.119	0.424	ug/l	3.28	4500.00	2068.00		P
135 Ba	3,983.500	796.700	ug/l	1.83	4500.00	688760.00		P
137 Ba	3,923.500	784.700	ug/l	1.37	4500.00	1199723.00		A
139 La	460.850	92.170	ug/l	1.55	4500.00	1350294.00		A
140 Ce	1,128.000	225.600	ug/l	2.44	4500.00	3201255.00		A
199 Hg	0.373	0.075	ug/l	13.36	450.00	172.33		P
200 Hg	0.450	0.090	ug/l	27.28	450.00	239.33		P
202 Hg	0.381	0.076	ug/l	14.45	450.00	267.67		P
203 Tl	2.157	0.431	ug/l	7.78	4500.00	3286.67		P
205 Tl	2.197	0.439	ug/l	5.57	4500.00	7663.33		P
206 Pb	300.900	60.180	ug/l	1.29	4500.00	239756.59		P
207 Pb	272.050	54.410	ug/l	2.65	4500.00	197260.00		P
208 Pb	283.750	56.750	ug/l	1.87	4500.00	930976.63		P
232 Th	146.150	29.230	ug/l	1.58	4500.00	505754.41		P
238 U	25.290	5.058	ug/l	2.25	4500.00	94783.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1120361.30	1.52	1107761.60	101.1	60.000002	-	125
72 Ge	1283873.00	2.23	1463530.60	87.7	60.000002	-	125
89 Y	2284065.00	1.71	1932167.40	118.2	60.000002	-	125
115 In	1653895.80	2.25	1952569.30	84.7	60.000002	-	125
209 Bi	3975961.80	1.34	4087579.80	97.3	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00859

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\089SMPL.D\089SMPL.D#
Date Acquired: Feb 6 2018 06:24 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-003B
Misc Info: 6010.20-S
Vial Number: 1304
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	6.080	1.216	ug/l	2.32	4500.00	2706.67		P
11 B	40.050	8.010	ug/l	5.32	4500.00	11845.56		P
27 Al	84,800.000	16960.000	ug/l	2.46	4500.00	84454088.00		A
47 Ti	894.000	178.800	ug/l	4.17	4500.00	90440.00		P
51 V	194.400	38.880	ug/l	3.02	4500.00	272724.50		P
52 Cr	89.600	17.920	ug/l	4.67	4500.00	119853.30		P
53 Cr	277.200	55.440	ug/l	8.75	4500.00	39163.33		P
55 Mn	4,107.000	821.400	ug/l	4.37	4500.00	6139726.00		A
57 Fe	155,950.000	31190.000	ug/l	3.94	4500.00	5205593.00		A
59 Co	60.350	12.070	ug/l	1.60	4500.00	86283.33		P
60 Ni	100.750	20.150	ug/l	5.60	4500.00	32536.67		P
62 Ni	103.450	20.690	ug/l	7.56	4500.00	5316.67		P
63 Cu	88.250	17.650	ug/l	3.15	4500.00	70216.66		P
65 Cu	90.050	18.010	ug/l	2.33	4500.00	34206.67		P
66 Zn	396.950	79.390	ug/l	1.55	4500.00	92572.53		P
75 As	56.150	11.230	ug/l	2.36	4500.00	16662.32		P
77 Se	400.000	80.000	ug/l	0.76	4500.00	6717.00		P
79 Br	28.875	5.775	ug/l	---	#VALUE!	1860.00		P
82 Se	3.835	0.767	ug/l	20.22	4500.00	129.93		P
88 Sr	1,079.500	215.900	ug/l	3.42	4500.00	2081570.00		A
95 Mo	9.840	1.968	ug/l	7.66	4500.00	4056.67		P
97 Mo	9.910	1.982	ug/l	11.49	4500.00	2573.33		P
98 Mo	10.095	2.019	ug/l	4.07	4500.00	6612.21		P
107 Ag	0.847	0.169	ug/l	9.99	1800.00	1446.67		P
109 Ag	0.647	0.129	ug/l	8.09	1800.00	1148.89		P
111 Cd	1.643	0.329	ug/l	10.08	4500.00	1209.77		P
114 Cd	-0.146	-0.029	ug/l	60.09	4500.00	107.08		P
118 Sn	26.045	5.209	ug/l	2.27	4500.00	16613.33		P
121 Sb	0.449	0.090	ug/l	8.15	4500.00	1219.67		P
123 Sb	0.453	0.091	ug/l	10.01	4500.00	941.00		P
135 Ba	1,894.500	378.900	ug/l	1.02	4500.00	335820.00		P
137 Ba	1,872.000	374.400	ug/l	0.87	4500.00	586820.00		P
139 La	227.950	45.590	ug/l	0.45	4500.00	684720.00		P
140 Ce	512.500	102.500	ug/l	2.19	4500.00	1490337.00		A
199 Hg	0.132	0.026	ug/l	41.07	450.00	122.00		P
200 Hg	0.110	0.022	ug/l	41.89	450.00	139.33		P
202 Hg	0.153	0.031	ug/l	27.52	450.00	181.67		P
203 Tl	0.866	0.173	ug/l	20.54	4500.00	2073.33		P
205 Tl	1.001	0.200	ug/l	5.44	4500.00	4910.00		P
206 Pb	115.550	23.110	ug/l	1.25	4500.00	95456.67		P
207 Pb	101.100	20.220	ug/l	1.20	4500.00	76130.00		P
208 Pb	107.450	21.490	ug/l	1.29	4500.00	365773.31		P
232 Th	72.600	14.520	ug/l	1.39	4500.00	262631.09		P
238 U	17.520	3.504	ug/l	3.30	4500.00	68806.66		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1044316.60	1.93	1107761.60	94.3	60.000002	-	125
72 Ge	1301316.10	3.55	1463530.60	88.9	60.000002	-	125
89 Y	2007817.60	0.28	1932167.40	103.9	60.000002	-	125
115 In	1694684.00	0.45	1952569.30	86.8	60.000002	-	125
209 Bi	4102388.80	1.57	4087579.80	100.4	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00860

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\090CCV.D\090CCV.D#
Date Acquired: Feb 6 2018 06:27 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	50.190	ug/l	3.45	50.00	85 - 115	90 - 110	
11 B	49.020	ug/l	2.42	50.00	85 - 115	90 - 110	
27 Al	106.900	ug/l	6.45	50.00	85 - 115	90 - 110	>15%
47 Ti	50.900	ug/l	1.90	50.00	85 - 115	90 - 110	
51 V	52.700	ug/l	4.10	50.00	85 - 115	90 - 110	
52 Cr	53.290	ug/l	3.61	50.00	85 - 115	90 - 110	
53 Cr	54.730	ug/l	2.60	50.00	85 - 115	90 - 110	
55 Mn	55.160	ug/l	2.87	50.00	85 - 115	90 - 110	>10%
57 Fe	1487.000	ug/l	3.14	1300.00	85 - 115	90 - 110	>10%
59 Co	52.600	ug/l	3.13	50.00	85 - 115	90 - 110	
60 Ni	53.200	ug/l	3.68	50.00	85 - 115	90 - 110	
62 Ni	51.090	ug/l	5.82	50.00	85 - 115	90 - 110	
63 Cu	51.680	ug/l	2.69	50.00	85 - 115	90 - 110	
65 Cu	50.780	ug/l	3.20	50.00	85 - 115	90 - 110	
66 Zn	49.730	ug/l	2.75	50.00	85 - 115	90 - 110	
75 As	51.190	ug/l	2.96	50.00	85 - 115	90 - 110	
77 Se	53.120	ug/l	1.43	50.00	85 - 115	90 - 110	
79 Br	1.412	ug/l	37.56	---	#### - ####	#### - ####	
82 Se	51.530	ug/l	2.31	50.00	85 - 115	90 - 110	
88 Sr	50.880	ug/l	2.12	50.00	85 - 115	90 - 110	
95 Mo	51.910	ug/l	1.02	50.00	85 - 115	90 - 110	
97 Mo	51.430	ug/l	1.57	50.00	85 - 115	90 - 110	
98 Mo	51.280	ug/l	2.18	50.00	85 - 115	90 - 110	
107 Ag	19.640	ug/l	3.92	20.00	85 - 115	90 - 110	
109 Ag	19.730	ug/l	3.59	20.00	85 - 115	90 - 110	
111 Cd	50.380	ug/l	1.93	50.00	85 - 115	90 - 110	
114 Cd	50.640	ug/l	1.52	50.00	85 - 115	90 - 110	
118 Sn	52.320	ug/l	1.69	50.00	85 - 115	90 - 110	
121 Sb	51.290	ug/l	1.21	50.00	85 - 115	90 - 110	
123 Sb	51.770	ug/l	0.95	50.00	85 - 115	90 - 110	
135 Ba	54.880	ug/l	4.09	50.00	85 - 115	90 - 110	
137 Ba	53.520	ug/l	2.40	50.00	85 - 115	90 - 110	
139 La	52.590	ug/l	1.75	50.00	85 - 115	90 - 110	
140 Ce	51.680	ug/l	1.19	50.00	85 - 115	90 - 110	
199 Hg	1.033	ug/l	4.13	1.00	85 - 115	90 - 110	
200 Hg	1.066	ug/l	2.61	1.00	85 - 115	90 - 110	
202 Hg	1.048	ug/l	2.23	1.00	85 - 115	90 - 110	
203 Tl	49.820	ug/l	0.49	50.00	85 - 115	90 - 110	
205 Tl	49.340	ug/l	0.11	50.00	85 - 115	90 - 110	
206 Pb	50.620	ug/l	0.79	50.00	85 - 115	90 - 110	
207 Pb	50.570	ug/l	1.15	50.00	85 - 115	90 - 110	
208 Pb	50.520	ug/l	0.89	50.00	85 - 115	90 - 110	
232 Th	48.080	ug/l	0.36	50.00	85 - 115	90 - 110	
238 U	52.030	ug/l	0.87	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1035299.10	2.57	1107761.60	93.5	60 - 125	
72 Ge	1324575.60	2.25	1463530.60	90.5	60 - 125	
89 Y	1806242.10	0.73	1932167.40	93.5	60 - 125	
115 In	1712717.40	0.53	1952569.30	87.7	60 - 125	
209 Bi	4228327.00	0.53	4087579.80	103.4	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

QC Range 1
1 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
3 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00861

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\091SMPL.D\091SMPL.D#
Date Acquired: Feb 6 2018 06:30 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.056	-0.056	ug/l	41.79	4500.00	371.11		P
11 B	-1.223	-1.223	ug/l	12.70	4500.00	2110.00		P
27 Al	35.130	35.130	ug/l	3.47	4500.00	175506.70		P
47 Ti	0.456	0.456	ug/l	16.37	4500.00	433.33		P
51 V	0.165	0.165	ug/l	78.62	4500.00	4033.62		P
52 Cr	0.380	0.380	ug/l	25.59	4500.00	14753.33		P
53 Cr	0.958	0.958	ug/l	36.77	4500.00	1530.00		P
55 Mn	1.208	1.208	ug/l	5.74	4500.00	11606.67		P
57 Fe	72.120	72.120	ug/l	3.53	4500.00	39716.67		P
59 Co	-0.060	-0.060	ug/l	13.43	4500.00	1746.67		P
60 Ni	0.027	0.027	ug/l	247.93	4500.00	483.33		P
62 Ni	-0.410	-0.410	ug/l	33.56	4500.00	283.33		P
63 Cu	-0.033	-0.033	ug/l	12.46	4500.00	1283.33		P
65 Cu	-0.049	-0.049	ug/l	60.21	4500.00	533.33		P
66 Zn	0.048	0.048	ug/l	174.18	4500.00	552.99		P
75 As	0.044	0.044	ug/l	47.43	4500.00	537.16		P
77 Se	1.223	1.223	ug/l	6.62	4500.00	234.67		P
79 Br	0.252	0.252	ug/l	---	#VALUE!	676.67		P
82 Se	0.263	0.263	ug/l	7.07	4500.00	75.07		P
88 Sr	0.262	0.262	ug/l	3.94	4500.00	4026.67		P
95 Mo	0.127	0.127	ug/l	25.55	4500.00	733.33		P
97 Mo	0.060	0.060	ug/l	85.76	4500.00	426.67		P
98 Mo	0.082	0.082	ug/l	32.83	4500.00	1043.67		P
107 Ag	0.161	0.161	ug/l	7.41	1800.00	1446.67		P
109 Ag	0.157	0.157	ug/l	12.60	1800.00	1314.44		P
111 Cd	-0.034	-0.034	ug/l	290.12	4500.00	805.08		P
114 Cd	0.007	0.007	ug/l	330.85	4500.00	207.37		P
118 Sn	0.165	0.165	ug/l	76.15	4500.00	1946.67		P
121 Sb	-0.069	-0.069	ug/l	4.37	4500.00	508.33		P
123 Sb	-0.066	-0.066	ug/l	4.52	4500.00	399.00		P
135 Ba	0.367	0.367	ug/l	27.18	4500.00	490.00		P
137 Ba	0.456	0.456	ug/l	11.39	4500.00	983.33		P
139 La	0.083	0.083	ug/l	9.78	4500.00	1683.33		P
140 Ce	0.163	0.163	ug/l	5.18	4500.00	2863.33		P
199 Hg	0.005	0.005	ug/l	177.17	450.00	101.67		P
200 Hg	0.006	0.006	ug/l	86.04	450.00	120.00		P
202 Hg	0.005	0.005	ug/l	160.75	450.00	134.67		P
203 Tl	-0.045	-0.045	ug/l	26.93	4500.00	1003.33		P
205 Tl	-0.004	-0.004	ug/l	395.34	4500.00	2466.67		P
206 Pb	0.634	0.634	ug/l	14.96	4500.00	3530.00		P
207 Pb	0.625	0.625	ug/l	7.85	4500.00	3270.00		P
208 Pb	0.600	0.600	ug/l	6.58	4500.00	13920.00		P
232 Th	0.117	0.117	ug/l	18.25	4500.00	9206.67		P
238 U	-0.022	-0.022	ug/l	43.47	4500.00	3220.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1012796.00	2.02	1107761.60	91.4	60.000002	-	125
72 Ge	1306294.90	0.82	1463530.60	89.3	60.000002	-	125
89 Y	1791537.40	1.56	1932167.40	92.7	60.000002	-	125
115 In	1744177.60	2.63	1952569.30	89.3	60.000002	-	125
209 Bi	4307409.50	0.55	4087579.80	105.4	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00862

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\092_CCB.D\092_CCB.D#
Date Acquired: Feb 6 2018 06:32 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:13 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	-0.128	ug/l	10.40	0.09	
11 B	-1.320	ug/l	9.27	1.18	
27 Al	24.550	ug/l	1.70	0.38	Fail
47 Ti	0.222	ug/l	81.44	0.17	Fail
51 V	-0.034	ug/l	144.21	0.09	
52 Cr	0.141	ug/l	62.50	0.12	Fail
53 Cr	0.996	ug/l	17.53	0.13	Fail
55 Mn	0.775	ug/l	4.65	0.14	Fail
57 Fe	53.680	ug/l	17.56	4.00	Fail
59 Co	-0.146	ug/l	10.68	0.04	
60 Ni	-0.048	ug/l	73.21	0.08	
62 Ni	-0.346	ug/l	98.09	0.32	
63 Cu	-0.125	ug/l	14.13	0.09	
65 Cu	-0.113	ug/l	21.07	0.22	
66 Zn	-0.068	ug/l	90.36	0.10	
75 As	-0.068	ug/l	85.47	0.12	
77 Se	0.930	ug/l	35.85	1.22	
79 Br	-0.036	ug/l	738.50	#VALUE!	
82 Se	-0.188	ug/l	87.15	0.32	
88 Sr	0.094	ug/l	6.79	0.05	Fail
95 Mo	-0.068	ug/l	44.52	0.05	
97 Mo	-0.101	ug/l	44.55	0.03	
98 Mo	-0.122	ug/l	13.99	0.03	
107 Ag	-0.007	ug/l	124.86	0.09	
109 Ag	0.011	ug/l	109.29	0.10	
111 Cd	-0.107	ug/l	60.66	0.03	
114 Cd	-0.076	ug/l	36.17	0.03	
118 Sn	-0.208	ug/l	9.72	0.05	
121 Sb	-0.115	ug/l	3.61	0.03	
123 Sb	-0.111	ug/l	2.52	0.04	
135 Ba	0.225	ug/l	24.79	0.09	Fail
137 Ba	0.250	ug/l	8.27	0.08	Fail
139 La	0.045	ug/l	18.12	0.02	Fail
140 Ce	0.078	ug/l	14.87	0.02	Fail
199 Hg	0.003	ug/l	184.55	0.03	
200 Hg	-0.001	ug/l	81.30	0.03	
202 Hg	0.004	ug/l	149.60	0.03	
203 Tl	-0.095	ug/l	30.27	0.03	
205 Tl	-0.071	ug/l	6.37	0.02	
206 Pb	0.543	ug/l	7.56	#VALUE!	
207 Pb	0.510	ug/l	4.28	#VALUE!	
208 Pb	0.514	ug/l	2.89	0.02	Fail
232 Th	-0.126	ug/l	1.71	0.06	
238 U	-0.104	ug/l	5.55	0.02	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1013700.80	1.33	1107761.60	91.5	60 - 125	
72 Ge	1326561.80	2.25	1463530.60	90.6	60 - 125	
89 Y	1818843.90	0.68	1932167.40	94.1	60 - 125	
115 In	1728001.30	2.07	1952569.30	88.5	60 - 125	
209 Bi	4308960.00	2.15	4087579.80	105.4	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

12 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00863

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\093SMPL.D\093SMPL.D#
Date Acquired: Feb 6 2018 06:35 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-004B
Misc Info: 6010.20-S
Vial Number: 1305
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	17.580	3.516	ug/l	0.55	4500.00	7144.44		P
11 B	55.650	11.130	ug/l	0.96	4500.00	15640.00		P
27 Al	265,900.000	53180.000	ug/l	2.80	4500.00	##########		A
47 Ti	998.000	199.600	ug/l	2.78	4500.00	97033.33		P
51 V	482.900	96.580	ug/l	2.41	4500.00	647023.31		A
52 Cr	248.600	49.720	ug/l	4.68	4500.00	298333.31		P
53 Cr	517.000	103.400	ug/l	4.72	4500.00	69503.33		P
55 Mn	7,125.000	1425.000	ug/l	3.50	4500.00	10234500.00		A
57 Fe	367,450.000	73490.000	ug/l	4.50	4500.00	11749010.00		A
59 Co	159.650	31.930	ug/l	3.08	4500.00	215823.30		P
60 Ni	261.200	52.240	ug/l	2.36	4500.00	80436.66		P
62 Ni	257.350	51.470	ug/l	2.88	4500.00	12153.33		P
63 Cu	289.100	57.820	ug/l	3.62	4500.00	217896.70		P
65 Cu	290.300	58.060	ug/l	1.20	4500.00	104650.00		P
66 Zn	1,031.000	206.200	ug/l	3.01	4500.00	230251.41		P
75 As	119.300	23.860	ug/l	2.20	4500.00	33518.77		P
77 Se	484.800	96.960	ug/l	3.76	4500.00	7788.67		P
79 Br	100.800	20.160	ug/l	---	#VALUE!	4753.33		P
82 Se	5.425	1.085	ug/l	11.06	4500.00	158.13		P
88 Sr	1,885.000	377.000	ug/l	3.02	4500.00	3491748.00		A
95 Mo	11.015	2.203	ug/l	0.83	4500.00	4220.00		P
97 Mo	10.695	2.139	ug/l	8.80	4500.00	2583.33		P
98 Mo	10.795	2.159	ug/l	3.25	4500.00	6604.16		P
107 Ag	2.770	0.554	ug/l	27.04	1800.00	3113.33		P
109 Ag	2.496	0.499	ug/l	24.36	1800.00	2700.00		P
111 Cd	4.784	0.957	ug/l	9.85	4500.00	1833.40		P
114 Cd	1.234	0.247	ug/l	13.77	4500.00	787.15		P
118 Sn	36.965	7.393	ug/l	0.93	4500.00	21630.00		P
121 Sb	1.729	0.346	ug/l	3.06	4500.00	2247.00		P
123 Sb	1.820	0.364	ug/l	4.59	4500.00	1795.00		P
135 Ba	3,878.000	775.600	ug/l	1.57	4500.00	646500.00		P
137 Ba	3,813.000	762.600	ug/l	0.62	4500.00	1124027.00		A
139 La	543.500	108.700	ug/l	1.72	4500.00	1534926.00		A
140 Ce	1,207.000	241.400	ug/l	2.48	4500.00	3303378.00		A
199 Hg	0.710	0.142	ug/l	8.63	450.00	245.00		P
200 Hg	0.645	0.129	ug/l	7.60	450.00	296.00		P
202 Hg	0.624	0.125	ug/l	13.18	450.00	361.33		P
203 Tl	3.650	0.730	ug/l	3.54	4500.00	4710.00		P
205 Tl	3.872	0.774	ug/l	1.20	4500.00	11610.00		P
206 Pb	296.450	59.290	ug/l	1.18	4500.00	233496.70		P
207 Pb	264.750	52.950	ug/l	2.58	4500.00	189763.30		P
208 Pb	277.300	55.460	ug/l	1.38	4500.00	899516.63		P
232 Th	189.250	37.850	ug/l	1.99	4500.00	645491.13		P
238 U	26.150	5.230	ug/l	3.29	4500.00	96753.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1079858.00	1.78	1107761.60	97.5	60.000002	-	125
72 Ge	1250459.00	3.76	1463530.60	85.4	60.000002	-	125
89 Y	2197008.00	1.97	1932167.40	113.7	60.000002	-	125
115 In	1594384.40	1.67	1952569.30	81.7	60.000002	-	125
209 Bi	3930430.00	1.94	4087579.80	96.2	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00864

Sample QC Report ICPMS202-B

Data File:	C:\ICPCHEM\1\DATA\18B06o00.B\094SMPL.D\094SMPL.D#
Date Acquired:	Feb 6 2018 06:38 pm
Acq. Method:	208CLdsa.M
Operator:	JPV
Sample Name:	B18020068-005B
Misc Info:	6010.20-S
Vial Number:	1306
Current Method:	C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File:	C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update:	Feb 06 2018 03:13 pm
Sample Type:	Sample
Dilution Factor:	5.00
Autodil Factor:	Undiluted
Final Dil Factor:	5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	5.415	1.083	ug/l	3.37	4500.00	2388.89		P
11 B	23.135	4.627	ug/l	1.94	4500.00	8054.44		P
27 Al	58,050.000	11610.000	ug/l	2.59	4500.00	56062552.00		A
47 Ti	1,508.000	301.600	ug/l	3.56	4500.00	148010.00		P
51 V	244.150	48.830	ug/l	3.24	4500.00	331955.31		P
52 Cr	67.800	13.560	ug/l	4.64	4500.00	91016.67		P
53 Cr	257.050	51.410	ug/l	5.75	4500.00	35356.67		P
55 Mn	5,765.000	1153.000	ug/l	1.91	4500.00	8372846.00		A
57 Fe	202,250.000	40450.000	ug/l	2.23	4500.00	6552005.00		A
59 Co	58.550	11.710	ug/l	3.09	4500.00	81316.66		P
60 Ni	77.250	15.450	ug/l	2.11	4500.00	24353.33		P
62 Ni	75.100	15.020	ug/l	1.76	4500.00	3846.67		P
63 Cu	57.550	11.510	ug/l	2.35	4500.00	44966.66		P
65 Cu	58.400	11.680	ug/l	3.60	4500.00	21740.00		P
66 Zn	358.500	71.700	ug/l	2.34	4500.00	81222.28		P
75 As	73.800	14.760	ug/l	3.52	4500.00	21123.98		P
77 Se	367.050	73.410	ug/l	1.92	4500.00	5995.33		P
79 Br	30.175	6.035	ug/l	---	#VALUE!	1860.00		P
82 Se	3.188	0.638	ug/l	25.69	4500.00	112.07		P
88 Sr	646.000	129.200	ug/l	2.96	4500.00	1210468.00		A
95 Mo	13.555	2.711	ug/l	4.53	4500.00	5216.67		P
97 Mo	13.105	2.621	ug/l	5.67	4500.00	3173.33		P
98 Mo	13.005	2.601	ug/l	4.52	4500.00	8006.03		P
107 Ag	0.381	0.076	ug/l	29.97	1800.00	958.89		P
109 Ag	0.236	0.047	ug/l	41.00	1800.00	737.78		P
111 Cd	1.971	0.394	ug/l	18.22	4500.00	1243.02		P
114 Cd	-0.385	-0.077	ug/l	44.33	4500.00	-18.14		P
118 Sn	24.800	4.960	ug/l	2.82	4500.00	15330.00		P
121 Sb	0.574	0.115	ug/l	9.01	4500.00	1287.67		P
123 Sb	0.626	0.125	ug/l	4.98	4500.00	1026.33		P
135 Ba	3,269.000	653.800	ug/l	1.00	4500.00	559143.31		P
137 Ba	3,248.500	649.700	ug/l	1.79	4500.00	982325.63		A
139 La	238.250	47.650	ug/l	1.49	4500.00	690473.31		P
140 Ce	503.500	100.700	ug/l	1.25	4500.00	1413237.00		A
199 Hg	0.071	0.014	ug/l	2.34	450.00	105.67		P
200 Hg	0.053	0.011	ug/l	87.28	450.00	118.67		P
202 Hg	0.094	0.019	ug/l	21.37	450.00	153.67		P
203 Tl	0.217	0.043	ug/l	21.60	4500.00	1380.00		P
205 Tl	0.338	0.068	ug/l	21.98	4500.00	3176.67		P
206 Pb	86.600	17.320	ug/l	0.83	4500.00	70270.00		P
207 Pb	76.100	15.220	ug/l	2.43	4500.00	56333.33		P
208 Pb	80.450	16.090	ug/l	0.17	4500.00	269046.59		P
232 Th	59.800	11.960	ug/l	0.53	4500.00	213034.41		P
238 U	11.160	2.232	ug/l	0.55	4500.00	44176.66		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1012599.40	1.23	1107761.60	91.4	60.000002	-	125
72 Ge	1263508.00	2.73	1463530.60	86.3	60.000002	-	125
89 Y	2004986.80	0.77	1932167.40	103.8	60.000002	-	125
115 In	1635628.10	1.36	1952569.30	83.8	60.000002	-	125
209 Bi	4017531.50	0.89	4087579.80	98.3	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00865

Sample QC Report ICPMS202-B

Data File:	C:\ICPCHEM\1\DATA\18B06o00.B\095SMPL.D\095SMPL.D#
Date Acquired:	Feb 6 2018 06:40 pm
Acq. Method:	208CLdsa.M
Operator:	JPV
Sample Name:	B18020068-006B
Misc Info:	6010.20-S
Vial Number:	1307
Current Method:	C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File:	C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update:	Feb 06 2018 03:13 pm
Sample Type:	Sample
Dilution Factor:	5.00
Autodil Factor:	Undiluted
Final Dil Factor:	5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	9.125	1.825	ug/l	3.24	4500.00	3825.55		P
11 B	69.850	13.970	ug/l	1.66	4500.00	18127.78		P
27 Al	181,050.000	36210.000	ug/l	1.81	4500.00	##########		A
47 Ti	908.500	181.700	ug/l	2.79	4500.00	88886.67		P
51 V	277.400	55.480	ug/l	0.62	4500.00	375363.81		P
52 Cr	180.000	36.000	ug/l	1.90	4500.00	220853.30		P
53 Cr	374.750	74.950	ug/l	3.58	4500.00	50976.66		P
55 Mn	4,527.000	905.400	ug/l	2.21	4500.00	6547329.00		A
57 Fe	221,900.000	44380.000	ug/l	1.70	4500.00	7155502.00		A
59 Co	87.350	17.470	ug/l	1.55	4500.00	119806.70		P
60 Ni	160.400	32.080	ug/l	1.66	4500.00	49880.00		P
62 Ni	151.000	30.200	ug/l	7.80	4500.00	7336.67		P
63 Cu	114.600	22.920	ug/l	1.24	4500.00	87776.67		P
65 Cu	114.200	22.840	ug/l	0.44	4500.00	41803.33		P
66 Zn	502.000	100.400	ug/l	1.33	4500.00	113167.90		P
75 As	51.450	10.290	ug/l	3.59	4500.00	14807.07		P
77 Se	457.350	91.470	ug/l	2.61	4500.00	7404.67		P
79 Br	43.260	8.652	ug/l	---	#VALUE!	2396.67		P
82 Se	3.446	0.689	ug/l	20.43	4500.00	117.07		P
88 Sr	1,865.500	373.100	ug/l	2.98	4500.00	3478217.00		A
95 Mo	9.730	1.946	ug/l	3.31	4500.00	3803.33		P
97 Mo	10.000	2.000	ug/l	2.98	4500.00	2453.33		P
98 Mo	9.700	1.940	ug/l	3.08	4500.00	6043.19		P
107 Ag	0.341	0.068	ug/l	12.30	1800.00	904.44		P
109 Ag	0.238	0.048	ug/l	15.88	1800.00	725.56		P
111 Cd	2.193	0.439	ug/l	23.15	4500.00	1266.51		P
114 Cd	-0.259	-0.052	ug/l	33.51	4500.00	44.74		P
118 Sn	30.760	6.152	ug/l	3.29	4500.00	18333.33		P
121 Sb	0.772	0.154	ug/l	6.14	4500.00	1434.33		P
123 Sb	0.832	0.166	ug/l	3.25	4500.00	1145.00		P
135 Ba	3,111.500	622.300	ug/l	2.24	4500.00	522023.31		P
137 Ba	3,104.500	620.900	ug/l	1.01	4500.00	921221.69		A
139 La	290.500	58.100	ug/l	1.58	4500.00	825930.00		P
140 Ce	650.000	130.000	ug/l	0.49	4500.00	1790820.00		A
199 Hg	0.145	0.029	ug/l	19.99	450.00	122.00		P
200 Hg	0.139	0.028	ug/l	24.79	450.00	144.67		P
202 Hg	0.164	0.033	ug/l	8.88	450.00	181.67		P
203 Tl	1.587	0.317	ug/l	6.82	4500.00	2736.67		P
205 Tl	1.415	0.283	ug/l	5.21	4500.00	5800.00		P
206 Pb	153.700	30.740	ug/l	2.23	4500.00	123593.30		P
207 Pb	133.350	26.670	ug/l	2.48	4500.00	97670.00		P
208 Pb	142.450	28.490	ug/l	2.19	4500.00	471820.00		P
232 Th	94.750	18.950	ug/l	2.78	4500.00	332181.09		P
238 U	20.410	4.082	ug/l	3.36	4500.00	77616.66		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1046321.30	0.88	1107761.60	94.5	60.000002	-	125
72 Ge	1258129.50	1.97	1463530.60	86.0	60.000002	-	125
89 Y	1982116.30	0.84	1932167.40	102.6	60.000002	-	125
115 In	1604753.30	2.36	1952569.30	82.2	60.000002	-	125
209 Bi	4000776.50	1.91	4087579.80	97.9	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00866

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\096SMPL.D\096SMPL.D#
Date Acquired: Feb 6 2018 06:43 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-007B
Misc Info: 6010.20-S
Vial Number: 1308
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	6.160	1.232	ug/l	2.01	4500.00	2646.67		P
11 B	54.750	10.950	ug/l	2.79	4500.00	14443.33		P
27 Al	139,100.000	27820.000	ug/l	6.25	4500.00	###########		A
47 Ti	797.000	159.400	ug/l	3.58	4500.00	77000.00		P
51 V	238.100	47.620	ug/l	2.89	4500.00	318253.81		P
52 Cr	115.550	23.110	ug/l	2.37	4500.00	144136.70		P
53 Cr	296.050	59.210	ug/l	6.05	4500.00	39893.33		P
55 Mn	5,715.000	1143.000	ug/l	3.34	4500.00	8157122.00		A
57 Fe	142,450.000	28490.000	ug/l	2.50	4500.00	4542732.00		A
59 Co	55.850	11.170	ug/l	3.60	4500.00	76303.33		P
60 Ni	99.200	19.840	ug/l	3.06	4500.00	30596.67		P
62 Ni	97.600	19.520	ug/l	10.99	4500.00	4806.67		P
63 Cu	69.650	13.930	ug/l	1.92	4500.00	53200.00		P
65 Cu	68.250	13.650	ug/l	4.98	4500.00	24880.00		P
66 Zn	304.900	60.980	ug/l	1.71	4500.00	67972.07		P
75 As	47.890	9.578	ug/l	5.08	4500.00	13625.55		P
77 Se	427.150	85.430	ug/l	2.00	4500.00	6835.00		P
79 Br	28.990	5.798	ug/l	---	#VALUE!	1780.00		P
82 Se	3.084	0.617	ug/l	27.93	4500.00	108.53		P
88 Sr	1,800.500	360.100	ug/l	3.39	4500.00	3313032.00		A
95 Mo	6.045	1.209	ug/l	1.02	4500.00	2540.00		P
97 Mo	5.530	1.106	ug/l	5.13	4500.00	1506.67		P
98 Mo	6.035	1.207	ug/l	4.42	4500.00	4040.83		P
107 Ag	0.047	0.009	ug/l	40.24	1800.00	634.44		P
109 Ag	-0.059	-0.012	ug/l	67.96	1800.00	464.44		P
111 Cd	1.344	0.269	ug/l	20.61	4500.00	1079.24		P
114 Cd	-0.207	-0.041	ug/l	73.92	4500.00	70.26		P
118 Sn	25.715	5.143	ug/l	5.25	4500.00	15553.33		P
121 Sb	0.329	0.066	ug/l	16.72	4500.00	1052.00		P
123 Sb	0.402	0.080	ug/l	4.59	4500.00	858.00		P
135 Ba	2,551.000	510.200	ug/l	1.14	4500.00	428373.31		P
137 Ba	2,524.000	504.800	ug/l	2.30	4500.00	749320.00		P
139 La	222.150	44.430	ug/l	1.65	4500.00	632136.69		P
140 Ce	492.000	98.400	ug/l	4.28	4500.00	1355668.00		A
199 Hg	0.010	0.002	ug/l	420.72	450.00	90.33		P
200 Hg	0.044	0.009	ug/l	55.72	450.00	113.67		P
202 Hg	0.054	0.011	ug/l	45.97	450.00	135.00		P
203 Tl	0.146	0.029	ug/l	86.30	4500.00	1286.67		P
205 Tl	0.189	0.038	ug/l	28.66	4500.00	2763.33		P
206 Pb	93.600	18.720	ug/l	2.12	4500.00	74530.00		P
207 Pb	82.500	16.500	ug/l	1.68	4500.00	59926.66		P
208 Pb	88.150	17.630	ug/l	1.53	4500.00	289130.00		P
232 Th	64.050	12.810	ug/l	1.96	4500.00	223586.70		P
238 U	16.690	3.338	ug/l	2.57	4500.00	63226.66		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1010591.60	4.17	1107761.60	91.2	60.000002	-	125
72 Ge	1241955.40	3.13	1463530.60	84.9	60.000002	-	125
89 Y	1893783.80	0.19	1932167.40	98.0	60.000002	-	125
115 In	1605939.00	2.20	1952569.30	82.2	60.000002	-	125
209 Bi	3947257.80	2.36	4087579.80	96.6	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00867

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\097SMPL.D\097SMPL.D#
Date Acquired: Feb 6 2018 06:46 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-008B
Misc Info: 6010.20-S
Vial Number: 1309
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	1.617	0.323	ug/l	14.34	4500.00	1060.00		P
11 B	11.490	2.298	ug/l	5.61	4500.00	5788.89		P
27 Al	38,090.000	7618.000	ug/l	5.41	4500.00	37433900.00		A
47 Ti	873.500	174.700	ug/l	3.84	4500.00	86336.67		P
51 V	121.400	24.280	ug/l	0.58	4500.00	167579.70		P
52 Cr	64.100	12.820	ug/l	3.02	4500.00	87253.33		P
53 Cr	366.550	73.310	ug/l	7.33	4500.00	50346.66		P
55 Mn	927.000	185.400	ug/l	2.47	4500.00	1356242.00		A
57 Fe	65,250.000	13050.000	ug/l	2.70	4500.00	2144241.00		A
59 Co	21.985	4.397	ug/l	4.94	4500.00	32030.00		P
60 Ni	38.565	7.713	ug/l	1.18	4500.00	12446.67		P
62 Ni	36.755	7.351	ug/l	6.85	4500.00	2083.33		P
63 Cu	30.940	6.188	ug/l	0.34	4500.00	24953.33		P
65 Cu	30.790	6.158	ug/l	6.95	4500.00	11840.00		P
66 Zn	127.200	25.440	ug/l	1.54	4500.00	29311.68		P
75 As	17.770	3.554	ug/l	6.91	4500.00	5463.71		P
77 Se	421.100	84.220	ug/l	4.38	4500.00	6895.33		P
79 Br	23.555	4.711	ug/l	---	#VALUE!	1590.00		P
82 Se	1.461	0.292	ug/l	97.67	4500.00	75.67		P
88 Sr	119.000	23.800	ug/l	2.71	4500.00	225540.00		P
95 Mo	4.882	0.976	ug/l	11.73	4500.00	2180.00		P
97 Mo	4.335	0.867	ug/l	7.46	4500.00	1276.67		P
98 Mo	4.635	0.927	ug/l	2.67	4500.00	3340.34		P
107 Ag	-0.084	-0.017	ug/l	76.47	1800.00	523.33		P
109 Ag	-0.111	-0.022	ug/l	27.11	1800.00	426.67		P
111 Cd	0.228	0.046	ug/l	30.20	4500.00	847.23		P
114 Cd	-0.642	-0.128	ug/l	14.46	4500.00	-150.21		P
118 Sn	23.090	4.618	ug/l	5.72	4500.00	14386.67		P
121 Sb	-0.129	-0.026	ug/l	6.71	4500.00	669.00		P
123 Sb	-0.139	-0.028	ug/l	13.06	4500.00	505.33		P
135 Ba	484.600	96.920	ug/l	1.59	4500.00	83113.33		P
137 Ba	484.200	96.840	ug/l	1.89	4500.00	146820.00		P
139 La	129.350	25.870	ug/l	1.64	4500.00	375676.69		P
140 Ce	264.950	52.990	ug/l	1.56	4500.00	745170.00		P
199 Hg	-0.009	-0.002	ug/l	32.41	450.00	87.00		P
200 Hg	0.037	0.007	ug/l	99.40	450.00	113.00		P
202 Hg	0.054	0.011	ug/l	20.56	450.00	137.00		P
203 Tl	-0.399	-0.080	ug/l	8.64	4500.00	760.00		P
205 Tl	-0.229	-0.046	ug/l	34.62	4500.00	1770.00		P
206 Pb	38.755	7.751	ug/l	2.55	4500.00	31690.00		P
207 Pb	34.710	6.942	ug/l	2.69	4500.00	25966.67		P
208 Pb	36.870	7.374	ug/l	1.21	4500.00	124280.00		P
232 Th	29.235	5.847	ug/l	2.40	4500.00	106920.00		P
238 U	4.356	0.871	ug/l	0.62	4500.00	19216.66		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1031056.20	3.31	1107761.60	93.1	60.000002	-	125
72 Ge	1271234.10	2.99	1463530.60	86.9	60.000002	-	125
89 Y	1820787.80	1.21	1932167.40	94.2	60.000002	-	125
115 In	1637899.60	1.45	1952569.30	83.9	60.000002	-	125
209 Bi	3997580.00	2.40	4087579.80	97.8	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00868

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\098SMPL.D\098SMPL.D#
Date Acquired: Feb 6 2018 06:48 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-009B
Misc Info: 6010.20-S
Vial Number: 1310
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	2.718	0.544	ug/l	8.04	4500.00	1432.22		P
11 B	30.400	6.080	ug/l	2.01	4500.00	9525.55		P
27 Al	61,750.000	12350.000	ug/l	2.21	4500.00	59607392.00		A
47 Ti	1,331.000	266.200	ug/l	3.38	4500.00	131793.30		P
51 V	181.350	36.270	ug/l	0.95	4500.00	249442.91		P
52 Cr	196.150	39.230	ug/l	1.12	4500.00	242616.59		P
53 Cr	480.700	96.140	ug/l	2.45	4500.00	65990.00		P
55 Mn	2,736.000	547.200	ug/l	1.96	4500.00	4008604.00		A
57 Fe	160,000.000	32000.000	ug/l	2.07	4500.00	5232475.00		A
59 Co	42.990	8.598	ug/l	2.17	4500.00	60786.66		P
60 Ni	70.300	14.060	ug/l	0.74	4500.00	22386.67		P
62 Ni	68.350	13.670	ug/l	12.08	4500.00	3566.67		P
63 Cu	58.250	11.650	ug/l	2.24	4500.00	45876.66		P
65 Cu	56.950	11.390	ug/l	1.00	4500.00	21403.33		P
66 Zn	202.800	40.560	ug/l	0.92	4500.00	46557.02		P
75 As	34.205	6.841	ug/l	3.14	4500.00	10125.78		P
77 Se	427.650	85.530	ug/l	2.40	4500.00	7021.00		P
79 Br	23.290	4.658	ug/l	---	#VALUE!	1586.67		P
82 Se	2.611	0.522	ug/l	48.09	4500.00	100.60		P
88 Sr	433.100	86.620	ug/l	1.59	4500.00	819036.88		A
95 Mo	25.025	5.005	ug/l	0.55	4500.00	9203.33		P
97 Mo	25.355	5.071	ug/l	2.51	4500.00	5803.33		P
98 Mo	25.570	5.114	ug/l	4.45	4500.00	14956.03		P
107 Ag	-0.069	-0.014	ug/l	102.45	1800.00	535.56		P
109 Ag	-0.081	-0.016	ug/l	33.14	1800.00	451.11		P
111 Cd	0.861	0.172	ug/l	11.99	4500.00	986.14		P
114 Cd	-0.564	-0.113	ug/l	41.49	4500.00	-109.02		P
118 Sn	24.605	4.921	ug/l	5.42	4500.00	15153.33		P
121 Sb	0.160	0.032	ug/l	7.68	4500.00	919.00		P
123 Sb	0.229	0.046	ug/l	9.13	4500.00	752.33		P
135 Ba	1,541.500	308.300	ug/l	1.91	4500.00	262650.00		P
137 Ba	1,535.000	307.000	ug/l	1.09	4500.00	462456.69		P
139 La	142.200	28.440	ug/l	1.98	4500.00	410590.00		P
140 Ce	285.500	57.100	ug/l	1.66	4500.00	798466.63		P
199 Hg	0.030	0.006	ug/l	34.13	450.00	96.67		P
200 Hg	0.045	0.009	ug/l	86.09	450.00	116.33		P
202 Hg	0.079	0.016	ug/l	79.47	450.00	148.00		P
203 Tl	-0.139	-0.028	ug/l	24.51	4500.00	1026.67		P
205 Tl	0.009	0.002	ug/l	425.66	4500.00	2373.33		P
206 Pb	53.400	10.680	ug/l	2.41	4500.00	43743.33		P
207 Pb	47.290	9.458	ug/l	0.94	4500.00	35396.67		P
208 Pb	50.150	10.030	ug/l	2.00	4500.00	169293.30		P
232 Th	33.045	6.609	ug/l	1.38	4500.00	121008.90		P
238 U	7.380	1.476	ug/l	4.82	4500.00	30433.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1012049.40	1.29	1107761.60	91.4	60.000002	-	125
72 Ge	1274108.40	1.70	1463530.60	87.1	60.000002	-	125
89 Y	1850301.10	0.86	1932167.40	95.8	60.000002	-	125
115 In	1629059.00	1.90	1952569.30	83.4	60.000002	-	125
209 Bi	4030210.50	1.85	4087579.80	98.6	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00869

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\099SMPL.D\099SMPL.D#
Date Acquired: Feb 6 2018 06:51 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-010B
Misc Info: 6010.20-S
Vial Number: 1311
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	21.950	4.390	ug/l	1.63	4500.00	9008.89		P
11 B	85.000	17.000	ug/l	2.37	4500.00	22524.44		P
27 Al	324,800.000	64960.000	ug/l	4.57	4500.00	###########		A
47 Ti	1,058.500	211.700	ug/l	4.49	4500.00	102276.70		P
51 V	565.500	113.100	ug/l	2.93	4500.00	752768.31		A
52 Cr	288.000	57.600	ug/l	2.72	4500.00	342040.00		P
53 Cr	582.000	116.400	ug/l	3.37	4500.00	77750.00		P
55 Mn	3,223.500	644.700	ug/l	2.35	4500.00	4608155.00		A
57 Fe	476,800.000	95360.000	ug/l	2.17	4500.00	15164940.00		A
59 Co	101.550	20.310	ug/l	2.77	4500.00	137333.30		P
60 Ni	209.200	41.840	ug/l	3.05	4500.00	64140.00		P
62 Ni	201.200	40.240	ug/l	5.32	4500.00	9523.33		P
63 Cu	342.950	68.590	ug/l	0.87	4500.00	257013.30		P
65 Cu	342.650	68.530	ug/l	2.32	4500.00	122720.00		P
66 Zn	1,224.500	244.900	ug/l	2.05	4500.00	271937.00		P
75 As	108.000	21.600	ug/l	3.22	4500.00	30213.23		P
77 Se	463.300	92.660	ug/l	1.73	4500.00	7413.00		P
79 Br	30.185	6.037	ug/l	---	#VALUE!	1833.33		P
82 Se	6.185	1.237	ug/l	8.97	4500.00	173.27		P
88 Sr	2,519.500	503.900	ug/l	1.64	4500.00	4642745.00		A
95 Mo	11.705	2.341	ug/l	5.88	4500.00	4423.33		P
97 Mo	12.145	2.429	ug/l	8.47	4500.00	2873.33		P
98 Mo	10.860	2.172	ug/l	1.14	4500.00	6591.31		P
107 Ag	0.948	0.190	ug/l	5.48	1800.00	1443.33		P
109 Ag	0.679	0.136	ug/l	6.82	1800.00	1101.11		P
111 Cd	3.378	0.676	ug/l	23.73	4500.00	1511.58		P
114 Cd	-0.021	-0.004	ug/l	301.50	4500.00	162.16		P
118 Sn	40.530	8.106	ug/l	1.79	4500.00	23420.00		P
121 Sb	2.086	0.417	ug/l	4.75	4500.00	2536.67		P
123 Sb	2.124	0.425	ug/l	2.96	4500.00	1982.67		P
135 Ba	5,250.000	1050.000	ug/l	0.84	4500.00	869034.00		A
137 Ba	5,215.000	1043.000	ug/l	1.07	4500.00	1525767.00		A
139 La	546.500	109.300	ug/l	2.37	4500.00	1532431.00		A
140 Ce	1,115.500	223.100	ug/l	2.64	4500.00	3030582.00		A
199 Hg	0.589	0.118	ug/l	11.39	450.00	216.67		P
200 Hg	0.641	0.128	ug/l	7.61	450.00	292.33		P
202 Hg	0.584	0.117	ug/l	5.91	450.00	343.00		P
203 Tl	2.756	0.551	ug/l	4.13	4500.00	3803.33		P
205 Tl	2.963	0.593	ug/l	6.91	4500.00	9340.00		P
206 Pb	355.300	71.060	ug/l	3.73	4500.00	277413.31		P
207 Pb	321.100	64.220	ug/l	2.49	4500.00	228213.30		P
208 Pb	335.200	67.040	ug/l	2.90	4500.00	1077920.00		P
232 Th	183.550	36.710	ug/l	2.37	4500.00	621244.38		P
238 U	19.540	3.908	ug/l	2.68	4500.00	72563.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1106041.50	2.26	1107761.60	99.8	60.000002	-	125
72 Ge	1243545.90	2.99	1463530.60	85.0	60.000002	-	125
89 Y	2226832.50	1.20	1932167.40	115.3	60.000002	-	125
115 In	1583087.10	1.11	1952569.30	81.1	60.000002	-	125
209 Bi	3900341.80	2.96	4087579.80	95.4	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00870

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\100SMPL.D\100SMPL.D#
Date Acquired: Feb 6 2018 06:54 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-011B
Misc Info: 6010.20-S
Vial Number: 1312
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	6.020	1.204	ug/l	2.81	4500.00	2612.22		P
11 B	40.240	8.048	ug/l	4.13	4500.00	11564.44		P
27 Al	86,300.000	17260.000	ug/l	3.75	4500.00	83613776.00		A
47 Ti	527.000	105.400	ug/l	4.64	4500.00	52133.33		P
51 V	197.250	39.450	ug/l	4.24	4500.00	269988.41		P
52 Cr	74.200	14.840	ug/l	2.66	4500.00	98966.67		P
53 Cr	329.150	65.830	ug/l	4.99	4500.00	45276.66		P
55 Mn	2,283.000	456.600	ug/l	2.10	4500.00	3333389.00		A
57 Fe	116,850.000	23370.000	ug/l	2.14	4500.00	3816066.00		A
59 Co	58.650	11.730	ug/l	1.46	4500.00	81896.66		P
60 Ni	79.300	15.860	ug/l	2.76	4500.00	25100.00		P
62 Ni	76.000	15.200	ug/l	5.62	4500.00	3903.33		P
63 Cu	57.750	11.550	ug/l	1.64	4500.00	45323.33		P
65 Cu	59.900	11.980	ug/l	0.84	4500.00	22410.00		P
66 Zn	302.500	60.500	ug/l	1.30	4500.00	68972.22		P
75 As	34.985	6.997	ug/l	2.41	4500.00	10307.10		P
77 Se	404.850	80.970	ug/l	5.04	4500.00	6627.67		P
79 Br	24.175	4.835	ug/l	---	#VALUE!	1616.67		P
82 Se	5.125	1.025	ug/l	2.19	4500.00	154.07		P
88 Sr	709.500	141.900	ug/l	4.27	4500.00	1335533.00		A
95 Mo	2.598	0.520	ug/l	1.21	4500.00	1366.67		P
97 Mo	2.821	0.564	ug/l	7.57	4500.00	940.00		P
98 Mo	2.342	0.468	ug/l	5.31	4500.00	2040.34		P
107 Ag	0.040	0.008	ug/l	116.81	1800.00	634.44		P
109 Ag	-0.065	-0.013	ug/l	54.16	1800.00	463.33		P
111 Cd	1.011	0.202	ug/l	27.77	4500.00	1016.05		P
114 Cd	-0.515	-0.103	ug/l	28.56	4500.00	-84.63		P
118 Sn	24.875	4.975	ug/l	3.60	4500.00	15253.33		P
121 Sb	0.248	0.050	ug/l	15.44	4500.00	993.00		P
123 Sb	0.322	0.064	ug/l	23.05	4500.00	813.67		P
135 Ba	1,745.500	349.100	ug/l	1.22	4500.00	296343.31		P
137 Ba	1,742.500	348.500	ug/l	1.06	4500.00	522996.69		P
139 La	225.900	45.180	ug/l	1.65	4500.00	649680.00		P
140 Ce	492.550	98.510	ug/l	1.28	4500.00	1372281.00		A
199 Hg	0.011	0.002	ug/l	203.29	450.00	91.67		P
200 Hg	0.078	0.016	ug/l	79.95	450.00	125.67		P
202 Hg	0.080	0.016	ug/l	48.05	450.00	147.67		P
203 Tl	0.152	0.030	ug/l	15.47	4500.00	1310.00		P
205 Tl	0.274	0.055	ug/l	7.74	4500.00	3010.00		P
206 Pb	94.600	18.920	ug/l	2.04	4500.00	76410.00		P
207 Pb	85.700	17.140	ug/l	1.48	4500.00	63113.33		P
208 Pb	89.450	17.890	ug/l	1.60	4500.00	297580.00		P
232 Th	58.350	11.670	ug/l	2.24	4500.00	207207.80		P
238 U	12.045	2.409	ug/l	2.92	4500.00	47230.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1016084.40	1.83	1107761.60	91.7	60.000002	-	125
72 Ge	1269879.40	2.60	1463530.60	86.8	60.000002	-	125
89 Y	1903482.10	1.16	1932167.40	98.5	60.000002	-	125
115 In	1623123.10	2.31	1952569.30	83.1	60.000002	-	125
209 Bi	4003985.00	1.79	4087579.80	98.0	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00871

Sample QC Report ICPMS202-B

Data File:	C:\ICPCHEM\1\DATA\18B06o00.B\101SMPL.D\101SMPL.D#
Date Acquired:	Feb 6 2018 06:56 pm
Acq. Method:	208CLdsa.M
Operator:	JPV
Sample Name:	B18020068-012B
Misc Info:	6010.20-S
Vial Number:	1313
Current Method:	C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File:	C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update:	Feb 06 2018 03:13 pm
Sample Type:	Sample
Dilution Factor:	5.00
Autodil Factor:	Undiluted
Final Dil Factor:	5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	10.265	2.053	ug/l	3.23	4500.00	4234.44		P
11 B	51.400	10.280	ug/l	1.96	4500.00	14223.33		P
27 Al	136,050.000	27210.000	ug/l	2.55	4500.00	##########		A
47 Ti	1,278.500	255.700	ug/l	4.26	4500.00	126213.30		P
51 V	255.450	51.090	ug/l	1.23	4500.00	349280.00		P
52 Cr	134.300	26.860	ug/l	1.83	4500.00	169466.70		P
53 Cr	427.350	85.470	ug/l	4.66	4500.00	58570.00		P
55 Mn	2,302.000	460.400	ug/l	2.35	4500.00	3362803.00		A
57 Fe	197,000.000	39400.000	ug/l	1.49	4500.00	6418002.00		A
59 Co	124.000	24.800	ug/l	1.21	4500.00	170913.30		P
60 Ni	145.550	29.110	ug/l	0.85	4500.00	45756.66		P
62 Ni	141.150	28.230	ug/l	4.04	4500.00	6943.33		P
63 Cu	121.350	24.270	ug/l	0.78	4500.00	93786.67		P
65 Cu	121.600	24.320	ug/l	1.19	4500.00	44903.33		P
66 Zn	559.500	111.900	ug/l	1.87	4500.00	127239.90		P
75 As	45.980	9.196	ug/l	2.80	4500.00	13412.12		P
77 Se	430.800	86.160	ug/l	1.79	4500.00	7051.67		P
79 Br	25.750	5.150	ug/l	---	#VALUE!	1683.33		P
82 Se	4.494	0.899	ug/l	23.79	4500.00	140.47		P
88 Sr	910.500	182.100	ug/l	3.08	4500.00	1714969.00		A
95 Mo	5.775	1.155	ug/l	4.05	4500.00	2490.00		P
97 Mo	5.755	1.151	ug/l	16.03	4500.00	1583.33		P
98 Mo	5.545	1.109	ug/l	3.19	4500.00	3844.09		P
107 Ag	0.349	0.070	ug/l	15.41	1800.00	928.89		P
109 Ag	0.233	0.047	ug/l	44.13	1800.00	735.56		P
111 Cd	3.049	0.610	ug/l	4.19	4500.00	1487.53		P
114 Cd	0.177	0.035	ug/l	98.56	4500.00	268.41		P
118 Sn	28.180	5.636	ug/l	4.68	4500.00	17243.33		P
121 Sb	0.330	0.066	ug/l	17.31	4500.00	1072.00		P
123 Sb	0.379	0.076	ug/l	14.09	4500.00	857.67		P
135 Ba	3,633.500	726.700	ug/l	2.19	4500.00	621306.69		P
137 Ba	3,597.500	719.500	ug/l	0.19	4500.00	1088143.00		A
139 La	346.800	69.360	ug/l	3.98	4500.00	1004572.00		A
140 Ce	747.500	149.500	ug/l	1.89	4500.00	2098795.00		A
199 Hg	0.230	0.046	ug/l	38.49	450.00	142.00		P
200 Hg	0.225	0.045	ug/l	18.81	450.00	172.67		P
202 Hg	0.217	0.043	ug/l	25.57	450.00	204.67		P
203 Tl	1.189	0.238	ug/l	12.82	4500.00	2363.33		P
205 Tl	1.244	0.249	ug/l	1.25	4500.00	5426.67		P
206 Pb	149.300	29.860	ug/l	1.56	4500.00	121063.30		P
207 Pb	133.500	26.700	ug/l	2.21	4500.00	98616.67		P
208 Pb	141.300	28.260	ug/l	1.74	4500.00	471946.69		P
232 Th	94.450	18.890	ug/l	2.19	4500.00	333893.31		P
238 U	46.350	9.270	ug/l	3.20	4500.00	173363.30		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1043855.00	1.54	1107761.60	94.2	60.000002	-	125
72 Ge	1270506.00	2.25	1463530.60	86.8	60.000002	-	125
89 Y	2059372.40	1.95	1932167.40	106.6	60.000002	-	125
115 In	1635625.50	2.38	1952569.30	83.8	60.000002	-	125
209 Bi	4034315.00	2.40	4087579.80	98.7	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00872

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\102SMPL.D\102SMPL.D#
Date Acquired: Feb 6 2018 06:59 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-013B
Misc Info: 6010.20-S
Vial Number: 1314
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	21.890	4.378	ug/l	3.63	4500.00	8788.89		P
11 B	68.950	13.790	ug/l	3.10	4500.00	18555.55		P
27 Al	393,200.000	78640.000	ug/l	3.00	4500.00	##########		A
47 Ti	599.500	119.900	ug/l	2.75	4500.00	57806.66		P
51 V	544.500	108.900	ug/l	2.74	4500.00	722603.19		A
52 Cr	293.450	58.690	ug/l	2.97	4500.00	346746.69		P
53 Cr	663.500	132.700	ug/l	3.26	4500.00	88183.33		P
55 Mn	7,135.000	1427.000	ug/l	2.92	4500.00	10151560.00		A
57 Fe	401,050.000	80210.000	ug/l	2.94	4500.00	12703410.00		A
59 Co	160.600	32.120	ug/l	3.08	4500.00	215046.59		P
60 Ni	276.350	55.270	ug/l	3.11	4500.00	84246.67		P
62 Ni	269.800	53.960	ug/l	2.68	4500.00	12600.00		P
63 Cu	265.400	53.080	ug/l	2.02	4500.00	198316.70		P
65 Cu	265.450	53.090	ug/l	3.65	4500.00	94783.33		P
66 Zn	1,133.500	226.700	ug/l	3.13	4500.00	250639.59		P
75 As	112.700	22.540	ug/l	1.73	4500.00	31390.14		P
77 Se	573.500	114.700	ug/l	3.16	4500.00	9104.00		P
79 Br	75.350	15.070	ug/l	---	#VALUE!	3663.33		P
82 Se	6.610	1.322	ug/l	5.75	4500.00	181.00		P
88 Sr	2,284.000	456.800	ug/l	3.53	4500.00	4189921.00		A
95 Mo	44.670	8.934	ug/l	0.34	4500.00	15730.00		P
97 Mo	42.780	8.556	ug/l	5.09	4500.00	9363.33		P
98 Mo	42.715	8.543	ug/l	2.46	4500.00	23977.98		P
107 Ag	0.910	0.182	ug/l	6.40	1800.00	1418.89		P
109 Ag	0.862	0.172	ug/l	6.81	1800.00	1270.00		P
111 Cd	4.734	0.947	ug/l	4.47	4500.00	1823.91		P
114 Cd	1.142	0.228	ug/l	7.51	4500.00	742.71		P
118 Sn	39.040	7.808	ug/l	1.26	4500.00	22776.67		P
121 Sb	1.109	0.222	ug/l	2.80	4500.00	1715.33		P
123 Sb	1.121	0.224	ug/l	4.17	4500.00	1330.33		P
135 Ba	4,651.000	930.200	ug/l	0.76	4500.00	775796.63		P
137 Ba	4,599.000	919.800	ug/l	0.57	4500.00	1356489.00		A
139 La	578.500	115.700	ug/l	0.76	4500.00	1634295.00		A
140 Ce	1,264.500	252.900	ug/l	0.37	4500.00	3462345.00		A
199 Hg	0.191	0.038	ug/l	70.85	450.00	129.33		P
200 Hg	0.246	0.049	ug/l	8.55	450.00	174.00		P
202 Hg	0.253	0.051	ug/l	7.76	450.00	213.00		P
203 Tl	3.886	0.777	ug/l	10.89	4500.00	4913.33		P
205 Tl	3.960	0.792	ug/l	3.55	4500.00	11763.33		P
206 Pb	331.150	66.230	ug/l	1.83	4500.00	259610.00		P
207 Pb	292.650	58.530	ug/l	1.09	4500.00	208803.30		P
208 Pb	307.400	61.480	ug/l	1.39	4500.00	992333.31		P
232 Th	195.350	39.070	ug/l	1.39	4500.00	663141.13		P
238 U	152.800	30.560	ug/l	1.71	4500.00	546913.31		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1082253.80	2.34	1107761.60	97.7	60.000002	-	125
72 Ge	1238378.00	3.24	1463530.60	84.6	60.000002	-	125
89 Y	2231941.80	1.39	1932167.40	115.5	60.000002	-	125
115 In	1595149.30	0.84	1952569.30	81.7	60.000002	-	125
209 Bi	3912945.30	1.74	4087579.80	95.7	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00873

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\103CCV.D\103CCV.D#
Date Acquired: Feb 6 2018 07:02 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	50.710	ug/l	3.74	50.00	85 - 115	90 - 110	
11 B	49.270	ug/l	4.23	50.00	85 - 115	90 - 110	
27 Al	153.500	ug/l	10.92	50.00	85 - 115	90 - 110	>15%
47 Ti	49.530	ug/l	1.73	50.00	85 - 115	90 - 110	
51 V	51.440	ug/l	2.89	50.00	85 - 115	90 - 110	
52 Cr	51.080	ug/l	3.60	50.00	85 - 115	90 - 110	
53 Cr	52.380	ug/l	3.47	50.00	85 - 115	90 - 110	
55 Mn	53.230	ug/l	3.42	50.00	85 - 115	90 - 110	
57 Fe	1418.000	ug/l	3.68	1300.00	85 - 115	90 - 110	
59 Co	50.540	ug/l	2.81	50.00	85 - 115	90 - 110	
60 Ni	51.250	ug/l	1.01	50.00	85 - 115	90 - 110	
62 Ni	49.040	ug/l	0.74	50.00	85 - 115	90 - 110	
63 Cu	50.280	ug/l	2.46	50.00	85 - 115	90 - 110	
65 Cu	49.770	ug/l	3.69	50.00	85 - 115	90 - 110	
66 Zn	49.670	ug/l	4.84	50.00	85 - 115	90 - 110	
75 As	50.390	ug/l	2.72	50.00	85 - 115	90 - 110	
77 Se	54.410	ug/l	3.64	50.00	85 - 115	90 - 110	
79 Br	1.490	ug/l	38.25	---	#### - ####	#### - ####	
82 Se	50.880	ug/l	2.74	50.00	85 - 115	90 - 110	
88 Sr	49.940	ug/l	3.28	50.00	85 - 115	90 - 110	
95 Mo	51.080	ug/l	3.98	50.00	85 - 115	90 - 110	
97 Mo	51.660	ug/l	4.90	50.00	85 - 115	90 - 110	
98 Mo	50.230	ug/l	4.40	50.00	85 - 115	90 - 110	
107 Ag	19.500	ug/l	1.64	20.00	85 - 115	90 - 110	
109 Ag	19.580	ug/l	0.71	20.00	85 - 115	90 - 110	
111 Cd	50.460	ug/l	3.84	50.00	85 - 115	90 - 110	
114 Cd	50.340	ug/l	4.27	50.00	85 - 115	90 - 110	
118 Sn	52.140	ug/l	4.29	50.00	85 - 115	90 - 110	
121 Sb	51.390	ug/l	4.52	50.00	85 - 115	90 - 110	
123 Sb	51.780	ug/l	4.52	50.00	85 - 115	90 - 110	
135 Ba	54.400	ug/l	2.54	50.00	85 - 115	90 - 110	
137 Ba	53.420	ug/l	3.42	50.00	85 - 115	90 - 110	
139 La	52.090	ug/l	3.94	50.00	85 - 115	90 - 110	
140 Ce	51.510	ug/l	3.02	50.00	85 - 115	90 - 110	
199 Hg	1.034	ug/l	2.06	1.00	85 - 115	90 - 110	
200 Hg	1.045	ug/l	5.29	1.00	85 - 115	90 - 110	
202 Hg	1.027	ug/l	2.28	1.00	85 - 115	90 - 110	
203 Tl	50.080	ug/l	3.38	50.00	85 - 115	90 - 110	
205 Tl	49.520	ug/l	1.77	50.00	85 - 115	90 - 110	
206 Pb	51.200	ug/l	2.25	50.00	85 - 115	90 - 110	
207 Pb	51.130	ug/l	3.12	50.00	85 - 115	90 - 110	
208 Pb	50.980	ug/l	2.61	50.00	85 - 115	90 - 110	
232 Th	49.740	ug/l	2.94	50.00	85 - 115	90 - 110	
238 U	51.980	ug/l	3.05	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	998828.38	2.56	1107761.60	90.2	60 - 125	
72 Ge	1333850.30	1.03	1463530.60	91.1	60 - 125	
89 Y	1801294.60	0.90	1932167.40	93.2	60 - 125	
115 In	1720499.00	2.63	1952569.30	88.1	60 - 125	
209 Bi	4215571.50	0.91	4087579.80	103.1	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

QC Range 1
1 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
1 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00874

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\104SMPL.D\104SMPL.D#
Date Acquired: Feb 6 2018 07:04 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.093	-0.093	ug/l	13.10	4500.00	296.67		P
11 B	-1.302	-1.302	ug/l	2.28	4500.00	1977.78		P
27 Al	53.910	53.910	ug/l	9.12	4500.00	259277.00		M
47 Ti	0.447	0.447	ug/l	36.61	4500.00	440.00		P
51 V	-0.032	-0.032	ug/l	385.50	4500.00	2729.62		P
52 Cr	-0.173	-0.173	ug/l	31.62	4500.00	11693.33		P
53 Cr	1.247	1.247	ug/l	22.83	4500.00	1770.00		P
55 Mn	1.034	1.034	ug/l	13.33	4500.00	10520.00		P
57 Fe	71.870	71.870	ug/l	15.10	4500.00	40590.00		P
59 Co	-0.075	-0.075	ug/l	34.04	4500.00	1676.67		P
60 Ni	0.009	0.009	ug/l	488.37	4500.00	466.67		P
62 Ni	-0.354	-0.354	ug/l	26.60	4500.00	303.33		P
63 Cu	-0.031	-0.031	ug/l	94.53	4500.00	1320.00		P
65 Cu	-0.039	-0.039	ug/l	41.24	4500.00	563.33		P
66 Zn	0.112	0.112	ug/l	92.05	4500.00	639.62		P
75 As	-0.054	-0.054	ug/l	66.40	4500.00	404.98		P
77 Se	1.588	1.588	ug/l	21.18	4500.00	270.67		P
79 Br	-0.396	-0.396	ug/l	---	#VALUE!	550.00		P
82 Se	0.000	0.000	ug/l	165670.00	4500.00	46.87		P
88 Sr	0.280	0.280	ug/l	7.36	4500.00	4296.67		P
95 Mo	0.101	0.101	ug/l	12.42	4500.00	686.67		P
97 Mo	0.051	0.051	ug/l	78.01	4500.00	416.67		P
98 Mo	0.077	0.077	ug/l	37.90	4500.00	1028.47		P
107 Ag	0.140	0.140	ug/l	23.78	1800.00	1346.67		P
109 Ag	0.145	0.145	ug/l	10.10	1800.00	1258.89		P
111 Cd	-0.072	-0.072	ug/l	31.07	4500.00	760.31		P
114 Cd	-0.018	-0.018	ug/l	89.60	4500.00	141.81		P
118 Sn	0.127	0.127	ug/l	27.54	4500.00	1840.00		P
121 Sb	-0.080	-0.080	ug/l	15.41	4500.00	459.67		P
123 Sb	-0.075	-0.075	ug/l	8.60	4500.00	367.00		P
135 Ba	0.725	0.725	ug/l	2.50	4500.00	816.67		P
137 Ba	0.693	0.693	ug/l	15.02	4500.00	1370.00		P
139 La	0.105	0.105	ug/l	19.21	4500.00	2030.00		P
140 Ce	0.197	0.197	ug/l	3.19	4500.00	3380.00		P
199 Hg	-0.011	-0.011	ug/l	45.38	450.00	83.33		P
200 Hg	0.003	0.003	ug/l	158.47	450.00	114.67		P
202 Hg	-0.004	-0.004	ug/l	201.23	450.00	116.67		P
203 Tl	-0.016	-0.016	ug/l	174.23	4500.00	1163.33		P
205 Tl	-0.016	-0.016	ug/l	58.74	4500.00	2313.33		P
206 Pb	0.686	0.686	ug/l	7.40	4500.00	3773.33		P
207 Pb	0.687	0.687	ug/l	7.18	4500.00	3526.67		P
208 Pb	0.692	0.692	ug/l	4.43	4500.00	15606.67		P
232 Th	0.084	0.084	ug/l	23.43	4500.00	8627.78		P
238 U	-0.029	-0.029	ug/l	50.91	4500.00	3093.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	986376.38	1.61	1107761.60	89.0	60.000002	-	125
72 Ge	1337476.10	2.75	1463530.60	91.4	60.000002	-	125
89 Y	1795907.80	1.53	1932167.40	92.9	60.000002	-	125
115 In	1747122.40	1.69	1952569.30	89.5	60.000002	-	125
209 Bi	4324611.50	0.99	4087579.80	105.8	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00875

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\105_CCB.D\105_CCB.D#
Date Acquired: Feb 6 2018 07:07 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:13 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	-0.152	ug/l	6.26	0.09	
11 B	-1.494	ug/l	0.95	1.18	
27 Al	34.810	ug/l	3.00	0.38	Fail
47 Ti	0.133	ug/l	110.49	0.17	
51 V	-0.072	ug/l	76.55	0.09	
52 Cr	-0.241	ug/l	31.80	0.12	
53 Cr	0.588	ug/l	11.98	0.13	Fail
55 Mn	0.685	ug/l	6.19	0.14	Fail
57 Fe	58.660	ug/l	7.64	4.00	Fail
59 Co	-0.143	ug/l	10.00	0.04	
60 Ni	-0.041	ug/l	4.97	0.08	
62 Ni	-0.539	ug/l	56.58	0.32	
63 Cu	-0.128	ug/l	13.40	0.09	
65 Cu	-0.110	ug/l	34.99	0.22	
66 Zn	-0.043	ug/l	196.30	0.10	
75 As	-0.076	ug/l	78.30	0.12	
77 Se	0.852	ug/l	37.86	1.22	
79 Br	-0.058	ug/l	698.63	#VALUE!	
82 Se	-0.193	ug/l	39.52	0.32	
88 Sr	0.108	ug/l	7.59	0.05	Fail
95 Mo	-0.142	ug/l	12.73	0.05	
97 Mo	-0.126	ug/l	42.61	0.03	
98 Mo	-0.154	ug/l	7.38	0.03	
107 Ag	-0.027	ug/l	11.22	0.09	
109 Ag	-0.005	ug/l	220.84	0.10	
111 Cd	-0.216	ug/l	11.33	0.03	
114 Cd	-0.085	ug/l	27.29	0.03	
118 Sn	-0.213	ug/l	17.09	0.05	
121 Sb	-0.131	ug/l	3.43	0.03	
123 Sb	-0.127	ug/l	5.07	0.04	
135 Ba	0.449	ug/l	6.85	0.09	Fail
137 Ba	0.357	ug/l	13.71	0.08	Fail
139 La	0.051	ug/l	9.70	0.02	Fail
140 Ce	0.115	ug/l	12.08	0.02	Fail
199 Hg	-0.006	ug/l	127.45	0.03	
200 Hg	-0.007	ug/l	94.75	0.03	
202 Hg	-0.011	ug/l	44.20	0.03	
203 Tl	-0.059	ug/l	26.91	0.03	
205 Tl	-0.048	ug/l	6.90	0.02	
206 Pb	0.388	ug/l	10.96	#VALUE!	
207 Pb	0.407	ug/l	8.40	#VALUE!	
208 Pb	0.398	ug/l	6.82	0.02	Fail
232 Th	-0.149	ug/l	4.51	0.06	
238 U	-0.112	ug/l	2.79	0.02	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1020421.30	1.84	1107761.60	92.1	60 - 125	
72 Ge	1328918.80	1.75	1463530.60	90.8	60 - 125	
89 Y	1833128.10	1.49	1932167.40	94.9	60 - 125	
115 In	1753577.60	1.00	1952569.30	89.8	60 - 125	
209 Bi	4359762.00	0.43	4087579.80	106.7	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

10 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

Sample QC Report ICPMS202-B

Data File:	C:\ICPCHEM\1\DATA\18B06o00.B\106SMPL.D\106SMPL.D#
Date Acquired:	Feb 6 2018 07:10 pm
Acq. Method:	208CLdsa.M
Operator:	JPV
Sample Name:	B18020068-014B
Misc Info:	6010.20-S
Vial Number:	1315
Current Method:	C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File:	C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update:	Feb 06 2018 03:13 pm
Sample Type:	Sample
Dilution Factor:	5.00
Autodil Factor:	Undiluted
Final Dil Factor:	5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	2.226	0.445	ug/l	6.71	4500.00	1223.33		P
11 B	15.830	3.166	ug/l	2.14	4500.00	6387.78		P
27 Al	37,860.000	7572.000	ug/l	2.80	4500.00	35558352.00		A
47 Ti	651.500	130.300	ug/l	2.86	4500.00	64440.00		P
51 V	143.200	28.640	ug/l	2.80	4500.00	196950.00		P
52 Cr	33.630	6.726	ug/l	5.94	4500.00	51493.33		P
53 Cr	195.900	39.180	ug/l	6.10	4500.00	27300.00		P
55 Mn	3,285.000	657.000	ug/l	2.99	4500.00	4797381.00		A
57 Fe	90,450.000	18090.000	ug/l	1.40	4500.00	2961748.00		A
59 Co	34.510	6.902	ug/l	3.32	4500.00	49063.33		P
60 Ni	52.250	10.450	ug/l	6.09	4500.00	16683.33		P
62 Ni	49.760	9.952	ug/l	4.38	4500.00	2686.67		P
63 Cu	31.010	6.202	ug/l	5.07	4500.00	24973.33		P
65 Cu	32.490	6.498	ug/l	4.36	4500.00	12436.67		P
66 Zn	158.950	31.790	ug/l	2.06	4500.00	36481.34		P
75 As	41.290	8.258	ug/l	3.76	4500.00	12086.62		P
77 Se	381.100	76.220	ug/l	1.15	4500.00	6254.33		P
79 Br	24.775	4.955	ug/l	---	#VALUE!	1643.33		P
82 Se	1.814	0.363	ug/l	16.74	4500.00	83.53		P
88 Sr	600.000	120.000	ug/l	2.76	4500.00	1131114.00		A
95 Mo	17.390	3.478	ug/l	7.79	4500.00	6510.00		P
97 Mo	16.845	3.369	ug/l	4.77	4500.00	3953.33		P
98 Mo	17.430	3.486	ug/l	3.79	4500.00	10391.80		P
107 Ag	1.265	0.253	ug/l	66.35	1800.00	1771.11		P
109 Ag	1.143	0.229	ug/l	68.75	1800.00	1540.00		P
111 Cd	0.854	0.171	ug/l	13.29	4500.00	980.25		P
114 Cd	-0.073	-0.015	ug/l	120.73	4500.00	139.41		P
118 Sn	23.185	4.637	ug/l	2.34	4500.00	14306.67		P
121 Sb	0.188	0.038	ug/l	13.02	4500.00	940.00		P
123 Sb	0.222	0.044	ug/l	30.96	4500.00	744.33		P
135 Ba	1,657.500	331.500	ug/l	1.70	4500.00	281266.69		P
137 Ba	1,630.500	326.100	ug/l	1.77	4500.00	489243.31		P
139 La	184.850	36.970	ug/l	1.11	4500.00	531470.00		P
140 Ce	373.550	74.710	ug/l	2.62	4500.00	1040351.00		A
199 Hg	0.084	0.017	ug/l	89.13	450.00	109.67		P
200 Hg	0.038	0.008	ug/l	59.03	450.00	115.33		P
202 Hg	0.025	0.005	ug/l	176.40	450.00	127.00		P
203 Tl	-0.249	-0.050	ug/l	34.40	4500.00	923.33		P
205 Tl	-0.004	-0.001	ug/l	1516.50	4500.00	2360.00		P
206 Pb	52.000	10.400	ug/l	0.98	4500.00	42963.33		P
207 Pb	46.015	9.203	ug/l	2.75	4500.00	34720.00		P
208 Pb	48.790	9.758	ug/l	2.42	4500.00	166060.00		P
232 Th	39.015	7.803	ug/l	1.80	4500.00	142767.80		P
238 U	28.410	5.682	ug/l	1.34	4500.00	108333.30		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	984455.75	1.25	1107761.60	88.9	60.000002	-	125
72 Ge	1270573.40	2.58	1463530.60	86.8	60.000002	-	125
89 Y	1884412.40	1.31	1932167.40	97.5	60.000002	-	125
115 In	1622252.50	0.70	1952569.30	83.1	60.000002	-	125
209 Bi	4061085.30	1.69	4087579.80	99.4	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00877

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\107SMPL.D\107SMPL.D#
Date Acquired: Feb 6 2018 07:12 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-014BDIL
Misc Info: 6010.20-S
Vial Number: 1401
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 25.00
Autodil Factor: Undiluted
Final Dil Factor: 25.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.907	-0.036	ug/l	79.07	4500.00	398.89		P
11 B	-16.770	-0.671	ug/l	8.98	4500.00	2625.55		P
27 Al	36,025.000	1441.000	ug/l	3.84	4500.00	6843983.00		A
47 Ti	642.250	25.690	ug/l	2.00	4500.00	12970.00		P
51 V	130.100	5.204	ug/l	4.09	4500.00	38396.80		P
52 Cr	39.750	1.590	ug/l	1.34	4500.00	21620.00		P
53 Cr	780.500	31.220	ug/l	3.44	4500.00	22113.33		P
55 Mn	3,282.500	131.300	ug/l	3.12	4500.00	968474.19		A
57 Fe	88,775.000	3551.000	ug/l	3.32	4500.00	607866.69		P
59 Co	28.625	1.145	ug/l	6.08	4500.00	9973.33		P
60 Ni	48.775	1.951	ug/l	5.91	4500.00	3493.33		P
62 Ni	37.475	1.499	ug/l	35.34	4500.00	723.33		P
63 Cu	31.650	1.266	ug/l	6.20	4500.00	6240.00		P
65 Cu	34.100	1.364	ug/l	10.31	4500.00	3113.33		P
66 Zn	181.850	7.274	ug/l	3.54	4500.00	8789.79		P
75 As	33.850	1.354	ug/l	21.87	4500.00	2377.85		P
77 Se	1,545.750	61.830	ug/l	1.56	4500.00	5140.00		P
79 Br	104.400	4.176	ug/l	---	#VALUE!	1493.33		P
82 Se	1.395	0.056	ug/l	299.77	4500.00	51.07		P
88 Sr	569.750	22.790	ug/l	3.91	4500.00	217586.70		P
95 Mo	13.895	0.556	ug/l	23.84	4500.00	1466.67		P
97 Mo	11.653	0.466	ug/l	7.54	4500.00	856.67		P
98 Mo	12.783	0.511	ug/l	11.58	4500.00	2217.98		P
107 Ag	0.714	0.029	ug/l	102.14	1800.00	748.89		P
109 Ag	0.983	0.039	ug/l	86.93	1800.00	714.44		P
111 Cd	-1.051	-0.042	ug/l	63.07	4500.00	761.47		P
114 Cd	-1.638	-0.066	ug/l	27.14	4500.00	11.65		P
118 Sn	18.603	0.744	ug/l	5.33	4500.00	3530.00		P
121 Sb	-2.500	-0.100	ug/l	5.73	4500.00	348.00		P
123 Sb	-2.346	-0.094	ug/l	1.96	4500.00	284.67		P
135 Ba	1,535.500	61.420	ug/l	0.57	4500.00	53720.00		P
137 Ba	1,536.000	61.440	ug/l	2.20	4500.00	94966.67		P
139 La	174.750	6.990	ug/l	1.94	4500.00	103646.70		P
140 Ce	342.000	13.680	ug/l	1.46	4500.00	196270.00		P
199 Hg	-0.073	-0.003	ug/l	95.86	450.00	90.00		P
200 Hg	-0.337	-0.013	ug/l	32.04	450.00	84.67		P
202 Hg	-0.286	-0.011	ug/l	13.70	450.00	96.33		P
203 Tl	-3.958	-0.158	ug/l	5.84	4500.00	386.67		P
205 Tl	-3.195	-0.128	ug/l	3.36	4500.00	806.67		P
206 Pb	46.950	1.878	ug/l	3.37	4500.00	8646.67		P
207 Pb	42.850	1.714	ug/l	4.84	4500.00	7323.33		P
208 Pb	45.050	1.802	ug/l	2.11	4500.00	34260.00		P
232 Th	37.975	1.519	ug/l	1.21	4500.00	34215.56		P
238 U	24.528	0.981	ug/l	2.57	4500.00	22240.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	995055.00	2.58	1107761.60	89.8	60.000002	-	125
72 Ge	1281276.10	3.44	1463530.60	87.5	60.000002	-	125
89 Y	1774526.30	1.57	1932167.40	91.8	60.000002	-	125
115 In	1668461.90	2.39	1952569.30	85.4	60.000002	-	125
209 Bi	4191271.30	1.09	4087579.80	102.5	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00878

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\108SMPL.D\108SMPL.D#
Date Acquired: Feb 6 2018 07:15 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-014BPDS1
Misc Info: 6010.20-S
Vial Number: 1402
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.10
Autodil Factor: Undiluted
Final Dil Factor: 5.10

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	255.663	50.130	ug/l	1.68	4500.00	87037.78		P
11 B	272.850	53.500	ug/l	2.10	4500.00	56241.11		P
27 Al	36,143.700	7087.000	ug/l	3.03	4500.00	3337276O.00		A
47 Ti	932.280	182.800	ug/l	0.79	4500.00	89506.67		P
51 V	409.377	80.270	ug/l	2.82	4500.00	541726.69		P
52 Cr	298.350	58.500	ug/l	2.40	4500.00	351376.69		P
53 Cr	489.600	96.000	ug/l	4.10	4500.00	65060.00		P
55 Mn	3,497.580	685.800	ug/l	2.71	4500.00	4960683.00		A
57 Fe	114,444.000	22440.000	ug/l	4.16	4500.00	3631915.00		A
59 Co	293.046	57.460	ug/l	1.68	4500.00	389393.31		P
60 Ni	309.570	60.700	ug/l	3.34	4500.00	94000.00		P
62 Ni	312.834	61.340	ug/l	4.55	4500.00	14503.33		P
63 Cu	283.101	55.510	ug/l	2.71	4500.00	210693.30		P
65 Cu	285.090	55.900	ug/l	2.50	4500.00	101420.00		P
66 Zn	400.809	78.590	ug/l	3.98	4500.00	88611.87		P
75 As	296.106	58.060	ug/l	1.24	4500.00	81463.05		P
77 Se	655.860	128.600	ug/l	4.59	4500.00	10357.67		P
79 Br	45.665	8.954	ug/l	---	#VALUE!	2460.00		P
82 Se	249.288	48.880	ug/l	2.21	4500.00	5201.27		P
88 Sr	845.070	165.700	ug/l	3.05	4500.00	1546277.00		A
95 Mo	287.079	56.290	ug/l	3.91	4500.00	97150.00		P
97 Mo	285.906	56.060	ug/l	5.16	4500.00	59806.66		P
98 Mo	286.977	56.270	ug/l	4.45	4500.00	154553.09		P
107 Ag	106.641	20.910	ug/l	3.10	1800.00	96676.67		P
109 Ag	106.590	20.900	ug/l	2.96	1800.00	92808.88		P
111 Cd	253.623	49.730	ug/l	3.06	4500.00	56177.58		P
114 Cd	252.858	49.580	ug/l	3.01	4500.00	124263.30		P
118 Sn	297.483	58.330	ug/l	3.30	4500.00	162320.00		P
121 Sb	260.508	51.080	ug/l	3.10	4500.00	221424.30		P
123 Sb	262.905	51.550	ug/l	3.39	4500.00	172984.70		P
135 Ba	1,935.450	379.500	ug/l	2.25	4500.00	318140.00		P
137 Ba	1,923.720	377.200	ug/l	3.65	4500.00	558986.69		P
139 La	465.936	91.360	ug/l	1.78	4500.00	1297601.00		A
140 Ce	655.350	128.500	ug/l	1.76	4500.00	1767707.00		A
199 Hg	5.416	1.062	ug/l	0.73	450.00	1258.00		P
200 Hg	5.365	1.052	ug/l	2.77	450.00	1690.00		P
202 Hg	5.442	1.067	ug/l	1.90	450.00	2224.67		P
203 Tl	255.918	50.180	ug/l	0.19	4500.00	245110.00		P
205 Tl	253.164	49.640	ug/l	0.70	4500.00	595680.00		P
206 Pb	315.894	61.940	ug/l	0.57	4500.00	242466.59		P
207 Pb	307.785	60.350	ug/l	0.55	4500.00	214930.00		P
208 Pb	310.539	60.890	ug/l	0.97	4500.00	981380.00		P
232 Th	307.785	60.350	ug/l	0.94	4500.00	1019173.00		A
238 U	299.166	58.660	ug/l	0.37	4500.00	1045122.00		A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	987229.81	1.69	1107761.60	89.1	60.000002	-	125
72 Ge	1258480.90	2.54	1463530.60	86.0	60.000002	-	125
89 Y	1885828.80	1.66	1932167.40	97.6	60.000002	-	125
115 In	1603806.80	3.27	1952569.30	82.1	60.000002	-	125
209 Bi	3906485.50	0.93	4087579.80	95.6	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00879

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\109SMPL.D\109SMPL.D#
Date Acquired: Feb 6 2018 07:18 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: SRM-118169
Misc Info: 6010.20-S
Vial Number: 1214
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	3,799.500	759.900	ug/l	2.08	4500.00	1367712.00		A
11 B	3,002.500	600.500	ug/l	4.60	4500.00	622640.13		A
27 Al	176,100.000	35220.000	ug/l	3.96	4500.00	###########		A
47 Ti	2,373.000	474.600	ug/l	1.86	4500.00	234616.59		P
51 V	1,488.500	297.700	ug/l	2.64	4500.00	2024597.00		A
52 Cr	3,750.500	750.100	ug/l	1.38	4500.00	4414286.00		A
53 Cr	4,187.000	837.400	ug/l	1.84	4500.00	567763.31		P
55 Mn	8,310.000	1662.000	ug/l	1.90	4500.00	12155570.00		A
57 Fe	82,950.000	16590.000	ug/l	0.95	4500.00	2722992.00		A
59 Co	1,309.500	261.900	ug/l	1.29	4500.00	1787931.00		A
60 Ni	3,024.500	604.900	ug/l	2.97	4500.00	943642.50		A
62 Ni	2,986.000	597.200	ug/l	1.81	4500.00	139630.00		P
63 Cu	1,568.000	313.600	ug/l	1.57	4500.00	1197879.00		A
65 Cu	1,569.500	313.900	ug/l	0.73	4500.00	573366.69		P
66 Zn	14,970.000	2994.000	ug/l	1.37	4500.00	3397301.00		A
75 As	2,514.500	502.900	ug/l	1.60	4500.00	710105.50		P
77 Se	1,315.500	263.100	ug/l	1.71	4500.00	21302.00		P
79 Br	46.905	9.381	ug/l	---	#VALUE!	2576.67		P
82 Se	883.000	176.600	ug/l	2.82	4500.00	18884.67		P
88 Sr	6,880.000	1376.000	ug/l	2.37	4500.00	12971410.00		A
95 Mo	1,199.500	239.900	ug/l	2.11	4500.00	410853.31		P
97 Mo	1,203.500	240.700	ug/l	2.11	4500.00	254823.30		P
98 Mo	1,180.000	236.000	ug/l	2.62	4500.00	643447.81		P
107 Ag	1,829.500	365.900	ug/l	2.65	1800.00	1675277.00		A
109 Ag	1,825.500	365.100	ug/l	1.35	1800.00	1606024.00		A
111 Cd	4,720.500	944.100	ug/l	1.30	4500.00	1048402.00		A
114 Cd	4,844.000	968.800	ug/l	2.30	4500.00	2414962.00		A
118 Sn	2,764.500	552.900	ug/l	0.51	4500.00	1521333.00		A
121 Sb	402.650	80.530	ug/l	1.51	4500.00	347223.69		P
123 Sb	406.000	81.200	ug/l	0.88	4500.00	271075.00		P
135 Ba	5,540.000	1108.000	ug/l	1.33	4500.00	924678.38		A
137 Ba	5,475.000	1095.000	ug/l	1.27	4500.00	1616205.00		A
139 La	167.650	33.530	ug/l	0.64	4500.00	474363.31		P
140 Ce	315.550	63.110	ug/l	2.14	4500.00	864932.63		A
199 Hg	96.450	19.290	ug/l	2.29	450.00	21624.33		P
200 Hg	96.050	19.210	ug/l	1.43	450.00	29524.33		P
202 Hg	95.350	19.070	ug/l	2.15	450.00	38335.33		P
203 Tl	1,100.500	220.100	ug/l	1.16	4500.00	1084650.00		A
205 Tl	1,077.000	215.400	ug/l	2.52	4500.00	2608827.00		A
206 Pb	3,289.500	657.900	ug/l	2.35	4500.00	2599978.00		A
207 Pb	3,002.500	600.500	ug/l	3.05	4500.00	2158346.00		A
208 Pb	3,082.500	616.500	ug/l	2.43	4500.00	10031420.00		A
232 Th	71.300	14.260	ug/l	2.49	4500.00	248817.80		P
238 U	27.420	5.484	ug/l	2.54	4500.00	101956.70		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	1028529.30	2.15	1107761.60	92.8	60.000002	-	125
72 Ge	1272780.50	1.80	1463530.60	87.0	60.000002	-	125
89 Y	1852398.40	1.53	1932167.40	95.9	60.000002	-	125
115 In	1596476.80	1.13	1952569.30	81.8	60.000002	-	125
209 Bi	3956001.50	1.90	4087579.80	96.8	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00880

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\110SMPL.D\110SMPL.D#
Date Acquired: Feb 6 2018 07:20 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-014BMS3
Misc Info: 6010.20-S
Vial Number: 1403
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	521.000	104.200	ug/l	1.08	4500.00	180868.91		P
11 B	1,068.000	213.600	ug/l	1.24	4500.00	215201.09		P
27 Al	77,650.000	15530.000	ug/l	0.97	4500.00	73267752.00		A
47 Ti	2,690.500	538.100	ug/l	0.59	4500.00	263190.00		P
51 V	1,337.500	267.500	ug/l	1.98	4500.00	1800673.00		A
52 Cr	1,122.000	224.400	ug/l	0.78	4500.00	1314764.00		A
53 Cr	1,288.500	257.700	ug/l	1.39	4500.00	173470.00		P
55 Mn	9,280.000	1856.000	ug/l	0.66	4500.00	13433440.00		A
57 Fe	169,800.000	33960.000	ug/l	1.50	4500.00	5486779.00		A
59 Co	1,107.500	221.500	ug/l	0.34	4500.00	1496336.00		A
60 Ni	1,120.000	224.000	ug/l	1.02	4500.00	346060.00		P
62 Ni	1,094.500	218.900	ug/l	1.78	4500.00	50880.00		P
63 Cu	1,059.000	211.800	ug/l	0.82	4500.00	800833.31		P
65 Cu	1,050.500	210.100	ug/l	1.24	4500.00	379793.31		P
66 Zn	1,194.500	238.900	ug/l	0.31	4500.00	268641.69		P
75 As	1,085.500	217.100	ug/l	0.49	4500.00	303589.19		P
77 Se	1,349.500	269.900	ug/l	1.27	4500.00	21620.00		P
79 Br	25.975	5.195	ug/l	---	#VALUE!	1680.00		P
82 Se	1,002.000	200.400	ug/l	0.54	4500.00	21200.93		P
88 Sr	1,474.000	294.800	ug/l	1.03	4500.00	2751978.00		A
95 Mo	1,066.000	213.200	ug/l	2.05	4500.00	367260.00		P
97 Mo	1,052.500	210.500	ug/l	1.73	4500.00	224033.30		P
98 Mo	1,055.000	211.000	ug/l	2.35	4500.00	578439.81		P
107 Ag	555.000	111.000	ug/l	2.51	1800.00	511357.69		P
109 Ag	554.500	110.900	ug/l	1.10	1800.00	490607.69		P
111 Cd	512.500	102.500	ug/l	1.97	4500.00	115083.40		P
114 Cd	510.500	102.100	ug/l	1.56	4500.00	256142.80		P
118 Sn	1,113.000	222.600	ug/l	1.86	4500.00	616340.00		P
121 Sb	725.500	145.100	ug/l	1.43	4500.00	628178.69		P
123 Sb	739.000	147.800	ug/l	1.85	4500.00	495502.59		P
135 Ba	2,654.000	530.800	ug/l	1.19	4500.00	445440.00		P
137 Ba	2,634.000	526.800	ug/l	0.39	4500.00	781723.31		P
139 La	1,307.000	261.400	ug/l	1.55	4500.00	3715112.00		A
140 Ce	1,426.500	285.300	ug/l	1.15	4500.00	3930349.00		A
199 Hg	0.219	0.044	ug/l	43.98	450.00	138.00		P
200 Hg	0.248	0.050	ug/l	35.59	450.00	177.33		P
202 Hg	0.279	0.056	ug/l	15.64	450.00	227.00		P
203 Tl	1,015.500	203.100	ug/l	0.61	4500.00	1007097.00		A
205 Tl	1,000.000	200.000	ug/l	1.05	4500.00	2436867.00		A
206 Pb	1,130.000	226.000	ug/l	1.75	4500.00	898806.63		P
207 Pb	1,119.000	223.800	ug/l	2.26	4500.00	809553.31		P
208 Pb	1,112.500	222.500	ug/l	1.64	4500.00	3644226.00		A
232 Th	1,121.500	224.300	ug/l	2.67	4500.00	3840469.00		A
238 U	1,104.000	220.800	ug/l	2.25	4500.00	3996827.00		A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	989169.44	1.40	1107761.60	89.3	60.000002	-	125
72 Ge	1259060.50	0.30	1463530.60	86.0	60.000002	-	125
89 Y	1877423.80	0.99	1932167.40	97.2	60.000002	-	125
115 In	1604938.10	1.06	1952569.30	82.2	60.000002	-	125
209 Bi	3979030.00	1.65	4087579.80	97.3	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00881

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\111SMPL.D\111SMPL.D#
Date Acquired: Feb 6 2018 07:23 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-014BMSD3
Misc Info: 6010.20-S
Vial Number: 1404
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	527.500	105.500	ug/l	2.21	4500.00	179896.59		P
11 B	1,090.000	218.000	ug/l	3.31	4500.00	215920.00		P
27 Al	93,250.000	18650.000	ug/l	2.29	4500.00	86510840.00		A
47 Ti	2,705.000	541.000	ug/l	1.93	4500.00	262046.70		P
51 V	1,271.500	254.300	ug/l	2.24	4500.00	1695466.00		A
52 Cr	1,115.000	223.000	ug/l	1.82	4500.00	1294310.00		A
53 Cr	1,307.500	261.500	ug/l	2.88	4500.00	174216.70		P
55 Mn	9,145.000	1829.000	ug/l	2.66	4500.00	13104910.00		A
57 Fe	118,750.000	23750.000	ug/l	2.16	4500.00	3808064.00		A
59 Co	1,099.000	219.800	ug/l	1.72	4500.00	1470594.00		A
60 Ni	1,108.000	221.600	ug/l	2.38	4500.00	338950.00		P
62 Ni	1,089.000	217.800	ug/l	2.40	4500.00	50133.33		P
63 Cu	1,048.000	209.600	ug/l	2.93	4500.00	784763.13		M
65 Cu	1,047.500	209.500	ug/l	2.43	4500.00	375043.31		P
66 Zn	1,200.500	240.100	ug/l	1.30	4500.00	267401.91		P
75 As	1,056.000	211.200	ug/l	1.79	4500.00	292462.19		P
77 Se	1,390.500	278.100	ug/l	2.91	4500.00	22049.67		P
79 Br	27.865	5.573	ug/l	---	#VALUE!	1743.33		P
82 Se	998.000	199.600	ug/l	3.18	4500.00	20906.53		P
88 Sr	2,555.000	511.000	ug/l	2.85	4500.00	4721330.00		A
95 Mo	1,057.000	211.400	ug/l	1.71	4500.00	360016.69		P
97 Mo	1,043.000	208.600	ug/l	2.12	4500.00	219520.00		P
98 Mo	1,041.000	208.200	ug/l	0.82	4500.00	564285.00		P
107 Ag	546.500	109.300	ug/l	0.31	1800.00	497687.69		P
109 Ag	546.000	109.200	ug/l	0.29	1800.00	477984.41		P
111 Cd	511.500	102.300	ug/l	0.74	4500.00	113602.40		P
114 Cd	509.500	101.900	ug/l	1.06	4500.00	252603.91		P
118 Sn	1,104.500	220.900	ug/l	0.92	4500.00	604793.31		P
121 Sb	658.500	131.700	ug/l	0.37	4500.00	564074.69		P
123 Sb	667.500	133.500	ug/l	0.42	4500.00	442568.69		P
135 Ba	3,106.500	621.300	ug/l	0.51	4500.00	515503.31		P
137 Ba	3,098.000	619.600	ug/l	1.11	4500.00	908973.88		A
139 La	1,372.000	274.400	ug/l	0.44	4500.00	3856902.00		A
140 Ce	1,557.500	311.500	ug/l	1.40	4500.00	4241318.00		A
199 Hg	0.091	0.018	ug/l	48.20	450.00	108.67		P
200 Hg	0.201	0.040	ug/l	30.73	450.00	162.67		P
202 Hg	0.168	0.034	ug/l	14.44	450.00	181.67		P
203 Tl	1,009.500	201.900	ug/l	1.94	4500.00	997376.50		M
205 Tl	992.000	198.400	ug/l	1.67	4500.00	2409510.00		A
206 Pb	1,105.500	221.100	ug/l	1.99	4500.00	876343.31		P
207 Pb	1,104.500	220.900	ug/l	1.17	4500.00	796466.63		P
208 Pb	1,097.500	219.500	ug/l	1.82	4500.00	3583424.00		A
232 Th	1,126.000	225.200	ug/l	1.17	4500.00	3842709.00		A
238 U	1,093.000	218.600	ug/l	1.59	4500.00	3944337.00		A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)		Flag
45 Sc	972747.13	1.92	1107761.60	87.8	60.000002	-		125
72 Ge	1247287.30	3.13	1463530.60	85.2	60.000002	-		125
89 Y	1919033.40	0.75	1932167.40	99.3	60.000002	-		125
115 In	1586677.40	0.93	1952569.30	81.3	60.000002	-		125
209 Bi	3965320.30	1.18	4087579.80	97.0	60.000002	-		125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00882

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\112SMPL.D\112SMPL.D#
Date Acquired: Feb 6 2018 07:25 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.133	0.133	ug/l	19.08	4500.00	674.44		P
11 B	1.556	1.556	ug/l	19.37	4500.00	4717.78		P
27 Al	38.010	38.010	ug/l	7.26	4500.00	181043.30		P
47 Ti	0.725	0.725	ug/l	24.65	4500.00	540.00		P
51 V	0.244	0.244	ug/l	42.31	4500.00	4356.91		P
52 Cr	0.293	0.293	ug/l	2.92	4500.00	13516.67		P
53 Cr	1.516	1.516	ug/l	15.60	4500.00	1820.00		P
55 Mn	2.823	2.823	ug/l	12.92	4500.00	22513.33		P
57 Fe	81.260	81.260	ug/l	11.72	4500.00	39153.33		P
59 Co	0.177	0.177	ug/l	47.17	4500.00	3226.67		P
60 Ni	0.285	0.285	ug/l	38.40	4500.00	850.00		P
62 Ni	-0.039	-0.039	ug/l	100.57	4500.00	353.33		P
63 Cu	0.263	0.263	ug/l	42.07	4500.00	2320.00		P
65 Cu	0.205	0.205	ug/l	32.31	4500.00	956.67		P
66 Zn	0.858	0.858	ug/l	17.71	4500.00	1419.58		P
75 As	0.346	0.346	ug/l	12.83	4500.00	925.19		P
77 Se	2.676	2.676	ug/l	19.60	4500.00	336.67		P
79 Br	0.044	0.044	ug/l ---		#VALUE!	600.00		P
82 Se	0.421	0.421	ug/l	18.44	4500.00	87.67		P
88 Sr	0.807	0.807	ug/l	12.75	4500.00	8823.33		P
95 Mo	0.498	0.498	ug/l	12.42	4500.00	1340.00		P
97 Mo	0.462	0.462	ug/l	19.70	4500.00	836.67		P
98 Mo	0.454	0.454	ug/l	19.82	4500.00	2018.47		P
107 Ag	0.249	0.249	ug/l	15.70	1800.00	1767.78		P
109 Ag	0.250	0.250	ug/l	11.22	1800.00	1652.22		P
111 Cd	0.220	0.220	ug/l	12.86	4500.00	1045.43		P
114 Cd	0.257	0.257	ug/l	5.77	4500.00	833.89		P
118 Sn	0.163	0.163	ug/l	49.96	4500.00	1823.33		P
121 Sb	0.273	0.273	ug/l	12.30	4500.00	1983.00		P
123 Sb	0.288	0.288	ug/l	5.17	4500.00	1584.00		P
135 Ba	0.819	0.819	ug/l	11.52	4500.00	846.67		P
137 Ba	0.825	0.825	ug/l	18.27	4500.00	1480.00		P
139 La	0.290	0.290	ug/l	16.22	4500.00	4570.00		P
140 Ce	0.337	0.337	ug/l	14.83	4500.00	5126.67		P
199 Hg	0.026	0.026	ug/l	13.64	450.00	122.00		P
200 Hg	0.024	0.024	ug/l	7.14	450.00	142.67		P
202 Hg	0.029	0.029	ug/l	3.19	450.00	179.33		P
203 Tl	0.352	0.352	ug/l	14.76	4500.00	2983.33		P
205 Tl	0.356	0.356	ug/l	11.78	4500.00	6856.67		P
206 Pb	0.885	0.885	ug/l	5.14	4500.00	4393.33		P
207 Pb	0.939	0.939	ug/l	4.37	4500.00	4290.00		P
208 Pb	0.911	0.911	ug/l	2.46	4500.00	18500.00		P
232 Th	0.353	0.353	ug/l	21.83	4500.00	12911.11		P
238 U	0.137	0.137	ug/l	38.34	4500.00	6013.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	968108.75	1.47	1107761.60	87.4	60.000002	-	125
72 Ge	1240401.90	0.87	1463530.60	84.8	60.000002	-	125
89 Y	1703799.00	2.06	1932167.40	88.2	60.000002	-	125
115 In	1637602.40	2.18	1952569.30	83.9	60.000002	-	125
209 Bi	4105311.80	2.85	4087579.80	100.4	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00883

Sample QC Report ICPMS202-B

Data File:	C:\ICPCHEM\1\DATA\18B06o00.B\113SMPL.D\113SMPL.D#
Date Acquired:	Feb 6 2018 07:28 pm
Acq. Method:	208CLdsa.M
Operator:	JPV
Sample Name:	Rinse
Misc Info:	ICPMS-200.8-W-D
Vial Number:	1
Current Method:	C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File:	C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update:	Feb 06 2018 03:13 pm
Sample Type:	Sample
Dilution Factor:	1.00
Autodil Factor:	Undiluted
Final Dil Factor:	1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.072	0.072	ug/l	39.31	4500.00	570.00		P
11 B	0.324	0.324	ug/l	98.24	4500.00	3510.00		P
27 Al	24.110	24.110	ug/l	2.98	4500.00	116580.00		P
47 Ti	0.329	0.329	ug/l	17.84	4500.00	356.67		P
51 V	0.174	0.174	ug/l	42.52	4500.00	3957.86		P
52 Cr	0.131	0.131	ug/l	87.76	4500.00	12803.33		P
53 Cr	0.653	0.653	ug/l	22.80	4500.00	1273.33		P
55 Mn	1.739	1.739	ug/l	6.30	4500.00	15056.67		P
57 Fe	54.410	54.410	ug/l	13.58	4500.00	35520.00		P
59 Co	0.026	0.026	ug/l	86.13	4500.00	2270.00		P
60 Ni	0.189	0.189	ug/l	26.20	4500.00	716.67		P
62 Ni	-0.352	-0.352	ug/l	66.93	4500.00	286.67		P
63 Cu	0.039	0.039	ug/l	104.13	4500.00	1513.33		P
65 Cu	0.101	0.101	ug/l	14.70	4500.00	786.67		P
66 Zn	0.601	0.601	ug/l	6.04	4500.00	1156.38		P
75 As	0.137	0.137	ug/l	25.08	4500.00	647.94		P
77 Se	1.303	1.303	ug/l	18.11	4500.00	233.00		P
79 Br	0.012	0.012	ug/l	---	#VALUE!	603.33		P
82 Se	0.038	0.038	ug/l	293.71	4500.00	48.53		P
88 Sr	0.435	0.435	ug/l	12.70	4500.00	5503.33		P
95 Mo	0.046	0.046	ug/l	62.95	4500.00	550.00		P
97 Mo	0.061	0.061	ug/l	105.49	4500.00	403.33		P
98 Mo	0.057	0.057	ug/l	46.14	4500.00	912.29		P
107 Ag	0.078	0.078	ug/l	12.30	1800.00	974.44		P
109 Ag	0.103	0.103	ug/l	6.99	1800.00	993.33		P
111 Cd	0.145	0.145	ug/l	17.22	4500.00	963.76		P
114 Cd	0.150	0.150	ug/l	36.46	4500.00	564.75		P
118 Sn	-0.115	-0.115	ug/l	16.71	4500.00	1046.67		P
121 Sb	0.051	0.051	ug/l	22.51	4500.00	1011.00		P
123 Sb	0.055	0.055	ug/l	14.61	4500.00	791.00		P
135 Ba	0.594	0.594	ug/l	14.56	4500.00	656.67		P
137 Ba	0.615	0.615	ug/l	13.00	4500.00	1170.00		P
139 La	0.144	0.144	ug/l	9.40	4500.00	2473.33		P
140 Ce	0.184	0.184	ug/l	7.93	4500.00	3006.67		P
199 Hg	0.031	0.031	ug/l	9.89	450.00	129.67		P
200 Hg	0.023	0.023	ug/l	14.37	450.00	143.00		P
202 Hg	0.027	0.027	ug/l	12.72	450.00	177.00		P
203 Tl	0.195	0.195	ug/l	24.30	4500.00	2226.67		P
205 Tl	0.174	0.174	ug/l	12.22	4500.00	4660.00		P
206 Pb	0.816	0.816	ug/l	5.29	4500.00	4186.67		P
207 Pb	0.877	0.877	ug/l	7.57	4500.00	4130.00		P
208 Pb	0.852	0.852	ug/l	1.76	4500.00	17836.67		P
232 Th	-0.007	-0.007	ug/l	255.73	4500.00	6710.00		P
238 U	0.024	0.024	ug/l	73.24	4500.00	3996.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	965089.38	0.44	1107761.60	87.1	60.000002	-	125
72 Ge	1263228.40	3.57	1463530.60	86.3	60.000002	-	125
89 Y	1731621.40	1.23	1932167.40	89.6	60.000002	-	125
115 In	1644143.60	1.51	1952569.30	84.2	60.000002	-	125
209 Bi	4180074.30	0.64	4087579.80	102.3	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00884

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\114SMPL.D\114SMPL.D#
Date Acquired: Feb 6 2018 07:31 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-015B
Misc Info: 6010.20-S
Vial Number: 1405
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	10.360	2.072	ug/l	0.63	4500.00	4160.00		P
11 B	58.000	11.600	ug/l	2.30	4500.00	15201.11		P
27 Al	134,600.000	26920.000	ug/l	1.99	4500.00	###########		A
47 Ti	1,235.500	247.100	ug/l	2.15	4500.00	118956.70		P
51 V	249.500	49.900	ug/l	1.53	4500.00	332577.69		P
52 Cr	129.950	25.990	ug/l	1.60	4500.00	160213.30		P
53 Cr	330.850	66.170	ug/l	0.89	4500.00	44416.66		P
55 Mn	1,869.500	373.900	ug/l	1.81	4500.00	2662819.00		A
57 Fe	187,000.000	37400.000	ug/l	3.16	4500.00	5938970.00		A
59 Co	91.600	18.320	ug/l	2.50	4500.00	123590.00		P
60 Ni	126.150	25.230	ug/l	4.51	4500.00	38680.00		P
62 Ni	121.800	24.360	ug/l	5.13	4500.00	5886.67		P
63 Cu	116.150	23.230	ug/l	2.44	4500.00	87560.00		P
65 Cu	117.000	23.400	ug/l	1.42	4500.00	42133.33		P
66 Zn	585.000	117.000	ug/l	1.74	4500.00	129683.50		P
75 As	53.400	10.680	ug/l	3.81	4500.00	15115.12		P
77 Se	365.950	73.190	ug/l	2.64	4500.00	5857.33		P
79 Br	22.055	4.411	ug/l	---	#VALUE!	1490.00		P
82 Se	3.387	0.677	ug/l	47.05	4500.00	113.60		P
88 Sr	962.000	192.400	ug/l	3.23	4500.00	1766548.00		A
95 Mo	5.455	1.091	ug/l	9.18	4500.00	2276.67		P
97 Mo	5.270	1.054	ug/l	9.76	4500.00	1413.33		P
98 Mo	5.580	1.116	ug/l	10.54	4500.00	3697.01		P
107 Ag	2.136	0.427	ug/l	21.92	1800.00	2492.22		P
109 Ag	1.889	0.378	ug/l	26.17	1800.00	2130.00		P
111 Cd	2.959	0.592	ug/l	10.51	4500.00	1404.99		P
114 Cd	0.303	0.061	ug/l	84.07	4500.00	318.92		P
118 Sn	29.690	5.938	ug/l	1.24	4500.00	17320.00		P
121 Sb	1.268	0.254	ug/l	6.21	4500.00	1819.00		P
123 Sb	1.207	0.241	ug/l	1.91	4500.00	1362.67		P
135 Ba	4,949.000	989.800	ug/l	1.62	4500.00	810429.69		M
137 Ba	4,849.500	969.900	ug/l	1.45	4500.00	1404322.00		A
139 La	339.000	67.800	ug/l	2.10	4500.00	940646.00		A
140 Ce	728.000	145.600	ug/l	2.91	4500.00	1957640.00		A
199 Hg	0.213	0.043	ug/l	40.22	450.00	135.33		P
200 Hg	0.264	0.053	ug/l	31.39	450.00	180.67		P
202 Hg	0.270	0.054	ug/l	8.62	450.00	221.33		P
203 Tl	2.572	0.514	ug/l	9.82	4500.00	3666.67		P
205 Tl	2.587	0.517	ug/l	6.33	4500.00	8550.00		P
206 Pb	146.100	29.220	ug/l	2.18	4500.00	115926.70		P
207 Pb	129.700	25.940	ug/l	1.46	4500.00	93733.33		P
208 Pb	136.400	27.280	ug/l	1.76	4500.00	445823.31		P
232 Th	100.150	20.030	ug/l	1.36	4500.00	346002.19		P
238 U	38.010	7.602	ug/l	1.27	4500.00	139726.70		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1017151.30	1.45	1107761.60	91.8	60.000002	-	125
72 Ge	1238607.80	2.81	1463530.60	84.6	60.000002	-	125
89 Y	1997274.30	1.39	1932167.40	103.4	60.000002	-	125
115 In	1566275.60	1.49	1952569.30	80.2	60.000002	-	125
209 Bi	3946234.30	1.28	4087579.80	96.5	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00885

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\115SMPL.D\115SMPL.D#
Date Acquired: Feb 6 2018 07:33 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-016B
Misc Info: 6010.20-S
Vial Number: 1406
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	21.050	4.210	ug/l	3.21	4500.00	8411.11		P
11 B	110.950	22.190	ug/l	1.97	4500.00	27477.78		P
27 Al	378,150.000	75630.000	ug/l	3.70	4500.00	###########		A
47 Ti	875.500	175.100	ug/l	1.79	4500.00	85820.00		P
51 V	467.600	93.520	ug/l	1.69	4500.00	631281.38		A
52 Cr	302.650	60.530	ug/l	2.20	4500.00	363453.31		P
53 Cr	583.000	116.600	ug/l	0.41	4500.00	78930.00		P
55 Mn	6,330.000	1266.000	ug/l	1.91	4500.00	9160528.00		A
57 Fe	370,200.000	74040.000	ug/l	2.25	4500.00	11930140.00		A
59 Co	166.800	33.360	ug/l	1.37	4500.00	227126.59		P
60 Ni	301.550	60.310	ug/l	1.55	4500.00	93476.67		P
62 Ni	301.000	60.200	ug/l	5.07	4500.00	14253.33		P
63 Cu	242.700	48.540	ug/l	1.39	4500.00	184560.00		P
65 Cu	239.350	47.870	ug/l	2.37	4500.00	87010.00		P
66 Zn	876.500	175.300	ug/l	2.34	4500.00	197259.91		P
75 As	38.475	7.695	ug/l	1.63	4500.00	11198.23		P
77 Se	471.950	94.390	ug/l	1.10	4500.00	7645.67		P
79 Br	29.650	5.930	ug/l	---	#VALUE!	1830.00		P
82 Se	3.522	0.704	ug/l	45.44	4500.00	118.53		P
88 Sr	2,771.500	554.300	ug/l	1.74	4500.00	5171970.00		A
95 Mo	4.519	0.904	ug/l	13.60	4500.00	1990.00		P
97 Mo	4.328	0.866	ug/l	5.42	4500.00	1236.67		P
98 Mo	4.099	0.820	ug/l	8.21	4500.00	2948.47		P
107 Ag	1.481	0.296	ug/l	13.24	1800.00	1932.22		P
109 Ag	1.334	0.267	ug/l	6.81	1800.00	1677.78		P
111 Cd	5.880	1.176	ug/l	11.23	4500.00	2069.91		P
114 Cd	2.274	0.455	ug/l	25.86	4500.00	1298.72		P
118 Sn	38.150	7.630	ug/l	1.31	4500.00	22210.00		P
121 Sb	2.335	0.467	ug/l	4.93	4500.00	2759.00		P
123 Sb	2.384	0.477	ug/l	1.65	4500.00	2163.67		P
135 Ba	4,061.500	812.300	ug/l	2.04	4500.00	674970.00		P
137 Ba	3,995.000	799.000	ug/l	1.62	4500.00	1174281.00		A
139 La	492.550	98.510	ug/l	3.46	4500.00	1386591.00		A
140 Ce	1,070.500	214.100	ug/l	2.92	4500.00	2920310.00		A
199 Hg	0.291	0.058	ug/l	29.45	450.00	150.33		P
200 Hg	0.311	0.062	ug/l	13.00	450.00	192.33		P
202 Hg	0.344	0.069	ug/l	17.96	450.00	247.00		P
203 Tl	2.951	0.590	ug/l	10.48	4500.00	3980.00		P
205 Tl	3.164	0.633	ug/l	4.87	4500.00	9790.00		P
206 Pb	315.700	63.140	ug/l	1.44	4500.00	245736.70		P
207 Pb	285.300	57.060	ug/l	2.15	4500.00	202073.30		P
208 Pb	298.750	59.750	ug/l	1.88	4500.00	957546.63		P
232 Th	156.900	31.380	ug/l	1.54	4500.00	530043.31		P
238 U	21.835	4.367	ug/l	3.70	4500.00	80396.66		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	1074616.80	2.24	1107761.60	97.0	60.000002	-	125
72 Ge	1259367.30	2.54	1463530.60	86.0	60.000002	-	125
89 Y	2232107.00	0.09	1932167.40	115.5	60.000002	-	125
115 In	1589870.10	2.62	1952569.30	81.4	60.000002	-	125
209 Bi	3885062.80	2.03	4087579.80	95.0	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00886

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\116CCV.D\116CCV.D#
Date Acquired: Feb 6 2018 07:36 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	51.280	ug/l	2.37	50.00	85 - 115	90 - 110	
11 B	49.930	ug/l	3.88	50.00	85 - 115	90 - 110	
27 Al	133.300	ug/l	7.85	50.00	85 - 115	90 - 110	>15%
47 Ti	51.380	ug/l	2.52	50.00	85 - 115	90 - 110	
51 V	51.890	ug/l	3.05	50.00	85 - 115	90 - 110	
52 Cr	51.620	ug/l	2.68	50.00	85 - 115	90 - 110	
53 Cr	53.740	ug/l	3.79	50.00	85 - 115	90 - 110	
55 Mn	54.000	ug/l	2.69	50.00	85 - 115	90 - 110	
57 Fe	1467.000	ug/l	3.93	1300.00	85 - 115	90 - 110	>10%
59 Co	51.700	ug/l	3.43	50.00	85 - 115	90 - 110	
60 Ni	51.810	ug/l	5.39	50.00	85 - 115	90 - 110	
62 Ni	50.390	ug/l	1.90	50.00	85 - 115	90 - 110	
63 Cu	51.290	ug/l	3.06	50.00	85 - 115	90 - 110	
65 Cu	51.100	ug/l	1.01	50.00	85 - 115	90 - 110	
66 Zn	50.420	ug/l	2.27	50.00	85 - 115	90 - 110	
75 As	51.200	ug/l	2.92	50.00	85 - 115	90 - 110	
77 Se	54.360	ug/l	4.64	50.00	85 - 115	90 - 110	
79 Br	1.587	ug/l	22.86	---	#### - ####	#### - ####	
82 Se	52.640	ug/l	5.14	50.00	85 - 115	90 - 110	
88 Sr	50.760	ug/l	2.77	50.00	85 - 115	90 - 110	
95 Mo	51.570	ug/l	3.08	50.00	85 - 115	90 - 110	
97 Mo	50.900	ug/l	1.58	50.00	85 - 115	90 - 110	
98 Mo	50.850	ug/l	3.03	50.00	85 - 115	90 - 110	
107 Ag	19.920	ug/l	1.94	20.00	85 - 115	90 - 110	
109 Ag	19.820	ug/l	2.67	20.00	85 - 115	90 - 110	
111 Cd	49.840	ug/l	2.67	50.00	85 - 115	90 - 110	
114 Cd	50.390	ug/l	1.74	50.00	85 - 115	90 - 110	
118 Sn	51.990	ug/l	3.34	50.00	85 - 115	90 - 110	
121 Sb	51.270	ug/l	2.48	50.00	85 - 115	90 - 110	
123 Sb	51.670	ug/l	2.49	50.00	85 - 115	90 - 110	
135 Ba	54.420	ug/l	1.39	50.00	85 - 115	90 - 110	
137 Ba	53.540	ug/l	3.49	50.00	85 - 115	90 - 110	
139 La	52.550	ug/l	2.13	50.00	85 - 115	90 - 110	
140 Ce	51.760	ug/l	2.19	50.00	85 - 115	90 - 110	
199 Hg	0.998	ug/l	2.99	1.00	85 - 115	90 - 110	
200 Hg	1.070	ug/l	2.26	1.00	85 - 115	90 - 110	
202 Hg	1.027	ug/l	0.89	1.00	85 - 115	90 - 110	
203 Tl	50.540	ug/l	0.85	50.00	85 - 115	90 - 110	
205 Tl	49.460	ug/l	0.36	50.00	85 - 115	90 - 110	
206 Pb	51.670	ug/l	0.62	50.00	85 - 115	90 - 110	
207 Pb	50.290	ug/l	1.75	50.00	85 - 115	90 - 110	
208 Pb	50.690	ug/l	0.62	50.00	85 - 115	90 - 110	
232 Th	49.200	ug/l	1.14	50.00	85 - 115	90 - 110	
238 U	50.750	ug/l	0.81	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	984164.75	1.44	1107761.60	88.8	60 - 125	
72 Ge	1313835.90	1.20	1463530.60	89.8	60 - 125	
89 Y	1792401.40	0.73	1932167.40	92.8	60 - 125	
115 In	1694371.80	0.89	1952569.30	86.8	60 - 125	
209 Bi	4213958.50	1.14	4087579.80	103.1	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

QC Range 1
1 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
2 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00887

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\117SMPL.D\117SMPL.D#
Date Acquired: Feb 6 2018 07:39 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.044	-0.044	ug/l	63.32	4500.00	381.11		P
11 B	-0.671	-0.671	ug/l	11.09	4500.00	2601.11		P
27 Al	40.340	40.340	ug/l	7.25	4500.00	195296.70		P
47 Ti	0.413	0.413	ug/l	26.21	4500.00	413.33		P
51 V	0.053	0.053	ug/l	87.39	4500.00	3266.78		P
52 Cr	0.029	0.029	ug/l	214.35	4500.00	12673.33		P
53 Cr	1.320	1.320	ug/l	12.23	4500.00	1786.67		P
55 Mn	1.003	1.003	ug/l	9.56	4500.00	10080.00		P
57 Fe	57.530	57.530	ug/l	12.23	4500.00	37370.00		P
59 Co	-0.049	-0.049	ug/l	59.62	4500.00	1826.67		P
60 Ni	0.184	0.184	ug/l	37.62	4500.00	736.67		P
62 Ni	-0.229	-0.229	ug/l	161.86	4500.00	326.67		P
63 Cu	-0.054	-0.054	ug/l	49.15	4500.00	1203.33		P
65 Cu	-0.003	-0.003	ug/l	1547.80	4500.00	620.00		P
66 Zn	0.281	0.281	ug/l	9.48	4500.00	826.29		P
75 As	0.001	0.001	ug/l	8627.80	4500.00	474.30		P
77 Se	1.873	1.873	ug/l	2.62	4500.00	289.33		P
79 Br	-0.140	-0.140	ug/l	---	#VALUE!	593.33		P
82 Se	0.011	0.011	ug/l	2823.70	4500.00	47.27		P
88 Sr	0.336	0.336	ug/l	14.23	4500.00	4746.67		P
95 Mo	0.130	0.130	ug/l	39.20	4500.00	730.00		P
97 Mo	0.134	0.134	ug/l	65.06	4500.00	506.67		P
98 Mo	0.096	0.096	ug/l	28.65	4500.00	1070.34		P
107 Ag	0.186	0.186	ug/l	12.47	1800.00	1553.33		P
109 Ag	0.204	0.204	ug/l	6.78	1800.00	1523.33		P
111 Cd	-0.084	-0.084	ug/l	40.34	4500.00	735.70		P
114 Cd	0.040	0.040	ug/l	69.86	4500.00	295.26		P
118 Sn	0.141	0.141	ug/l	45.74	4500.00	1860.00		P
121 Sb	-0.033	-0.033	ug/l	17.19	4500.00	669.00		P
123 Sb	-0.028	-0.028	ug/l	12.81	4500.00	531.67		P
135 Ba	0.584	0.584	ug/l	17.29	4500.00	680.00		P
137 Ba	0.527	0.527	ug/l	13.59	4500.00	1086.67		P
139 La	0.113	0.113	ug/l	4.22	4500.00	2123.33		P
140 Ce	0.157	0.157	ug/l	14.92	4500.00	2750.00		P
199 Hg	0.004	0.004	ug/l	123.36	450.00	98.00		P
200 Hg	0.004	0.004	ug/l	127.80	450.00	114.00		P
202 Hg	0.008	0.008	ug/l	42.14	450.00	137.00		P
203 Tl	-0.001	-0.001	ug/l	3889.30	4500.00	1210.00		P
205 Tl	0.023	0.023	ug/l	78.57	4500.00	2746.67		P
206 Pb	0.757	0.757	ug/l	8.93	4500.00	3963.33		P
207 Pb	0.781	0.781	ug/l	4.11	4500.00	3786.67		P
208 Pb	0.787	0.787	ug/l	4.98	4500.00	16806.67		P
232 Th	0.151	0.151	ug/l	7.41	4500.00	9596.67		P
238 U	-0.018	-0.018	ug/l	34.77	4500.00	3206.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	985682.00	1.20	1107761.60	89.0	60.000002	-	125
72 Ge	1310055.10	2.26	1463530.60	89.5	60.000002	-	125
89 Y	1776784.90	0.95	1932167.40	92.0	60.000002	-	125
115 In	1723202.50	1.96	1952569.30	88.3	60.000002	-	125
209 Bi	4202440.00	0.55	4087579.80	102.8	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00888

CCB QC Report **ICPMS202-B**

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\118_CCB.D\118_CCB.D#
Date Acquired: Feb 6 2018 07:41 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:13 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	-0.116	ug/l	8.89	0.09	
11 B	-1.127	ug/l	4.79	1.18	
27 Al	26.280	ug/l	3.49	0.38	Fail
47 Ti	0.139	ug/l	32.44	0.17	
51 V	-0.021	ug/l	128.65	0.09	
52 Cr	-0.153	ug/l	39.80	0.12	
53 Cr	0.655	ug/l	1.86	0.13	Fail
55 Mn	0.629	ug/l	6.10	0.14	Fail
57 Fe	42.230	ug/l	13.76	4.00	Fail
59 Co	-0.134	ug/l	10.56	0.04	
60 Ni	-0.029	ug/l	110.28	0.08	
62 Ni	-0.438	ug/l	98.97	0.32	
63 Cu	-0.100	ug/l	25.26	0.09	
65 Cu	-0.095	ug/l	42.06	0.22	
66 Zn	0.088	ug/l	70.47	0.10	
75 As	-0.088	ug/l	27.74	0.12	
77 Se	1.219	ug/l	23.57	1.22	
79 Br	0.078	ug/l	699.23	#VALUE!	
82 Se	0.024	ug/l	132.08	0.32	
88 Sr	0.133	ug/l	12.37	0.05	Fail
95 Mo	-0.064	ug/l	39.32	0.05	
97 Mo	-0.102	ug/l	35.06	0.03	
98 Mo	-0.090	ug/l	25.22	0.03	
107 Ag	0.015	ug/l	95.53	0.09	
109 Ag	0.019	ug/l	8.94	0.10	
111 Cd	-0.122	ug/l	31.02	0.03	
114 Cd	-0.040	ug/l	35.80	0.03	
118 Sn	-0.141	ug/l	41.96	0.05	
121 Sb	-0.094	ug/l	7.62	0.03	
123 Sb	-0.089	ug/l	7.59	0.04	
135 Ba	0.259	ug/l	18.66	0.09	Fail
137 Ba	0.265	ug/l	36.91	0.08	Fail
139 La	0.062	ug/l	22.92	0.02	Fail
140 Ce	0.104	ug/l	11.77	0.02	Fail
199 Hg	0.005	ug/l	29.52	0.03	
200 Hg	0.008	ug/l	37.28	0.03	
202 Hg	0.007	ug/l	18.55	0.03	
203 Tl	-0.068	ug/l	46.62	0.03	
205 Tl	-0.031	ug/l	11.84	0.02	
206 Pb	0.605	ug/l	7.53	#VALUE!	
207 Pb	0.631	ug/l	10.34	#VALUE!	
208 Pb	0.619	ug/l	6.07	0.02	Fail
232 Th	-0.116	ug/l	7.09	0.06	
238 U	-0.097	ug/l	5.30	0.02	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	1006614.00	2.14	1107761.60	90.9	60 - 125	
72 Ge	1327819.90	1.69	1463530.60	90.7	60 - 125	
89 Y	1817513.00	2.14	1932167.40	94.1	60 - 125	
115 In	1741673.00	1.05	1952569.30	89.2	60 - 125	
209 Bi	4299392.50	1.57	4087579.80	105.2	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

10 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\119SMPL.D\119SMPL.D#
Date Acquired: Feb 6 2018 07:44 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-017B
Misc Info: 6010.20-S
Vial Number: 1407
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	11.785	2.357	ug/l	2.84	4500.00	4412.22		P
11 B	42.460	8.492	ug/l	4.90	4500.00	11375.55		P
27 Al	46,710.000	9342.000	ug/l	4.87	4500.00	42843440.00		A
47 Ti	4,380.500	876.100	ug/l	2.15	4500.00	406356.69		P
51 V	364.550	72.910	ug/l	1.52	4500.00	467472.09		P
52 Cr	58.600	11.720	ug/l	3.44	4500.00	75946.66		P
53 Cr	197.250	39.450	ug/l	2.88	4500.00	25856.67		P
55 Mn	25,875.000	5175.000	ug/l	0.74	4500.00	35527232.00		A
57 Fe	863,500.000	172700.000	ug/l	0.97	4500.00	26375450.00		A
59 Co	144.450	28.890	ug/l	1.93	4500.00	186860.00		P
60 Ni	171.050	34.210	ug/l	1.12	4500.00	50483.33		P
62 Ni	174.850	34.970	ug/l	3.08	4500.00	8006.67		P
63 Cu	78.250	15.650	ug/l	4.16	4500.00	57326.66		P
65 Cu	78.300	15.660	ug/l	3.70	4500.00	27376.67		P
66 Zn	592.500	118.500	ug/l	2.44	4500.00	126621.40		P
75 As	143.300	28.660	ug/l	1.59	4500.00	38386.33		P
77 Se	508.000	101.600	ug/l	0.31	4500.00	7795.33		P
79 Br	17.030	3.406	ug/l	---	#VALUE!	1240.00		P
82 Se	33.610	6.722	ug/l	5.66	4500.00	715.47		P
88 Sr	1,976.000	395.200	ug/l	1.85	4500.00	3499086.00		A
95 Mo	22.995	4.599	ug/l	2.94	4500.00	7853.33		P
97 Mo	21.365	4.273	ug/l	3.74	4500.00	4570.00		P
98 Mo	22.685	4.537	ug/l	5.65	4500.00	12347.98		P
107 Ag	1.746	0.349	ug/l	29.24	1800.00	2057.78		P
109 Ag	1.506	0.301	ug/l	43.57	1800.00	1727.78		P
111 Cd	4.753	0.951	ug/l	6.87	4500.00	1725.95		P
114 Cd	0.168	0.034	ug/l	38.27	4500.00	243.39		P
118 Sn	29.450	5.890	ug/l	1.64	4500.00	16533.33		P
121 Sb	3.438	0.688	ug/l	2.51	4500.00	3510.33		P
123 Sb	3.623	0.725	ug/l	1.25	4500.00	2829.00		P
135 Ba	4,514.500	902.900	ug/l	1.66	4500.00	711040.00		P
137 Ba	4,447.500	889.500	ug/l	1.99	4500.00	1238482.00		A
139 La	272.400	54.480	ug/l	1.28	4500.00	727066.63		P
140 Ce	535.000	107.000	ug/l	1.90	4500.00	1383798.00		A
199 Hg	0.186	0.037	ug/l	24.06	450.00	125.33		P
200 Hg	0.151	0.030	ug/l	39.54	450.00	142.00		P
202 Hg	0.171	0.034	ug/l	21.66	450.00	176.33		P
203 Tl	0.579	0.116	ug/l	4.33	4500.00	1656.67		P
205 Tl	0.721	0.144	ug/l	22.42	4500.00	3916.67		P
206 Pb	106.550	21.310	ug/l	2.24	4500.00	82033.33		P
207 Pb	93.850	18.770	ug/l	0.69	4500.00	65903.33		P
208 Pb	98.700	19.740	ug/l	1.83	4500.00	313086.69		P
232 Th	49.815	9.963	ug/l	3.50	4500.00	169786.59		P
238 U	92.650	18.530	ug/l	1.61	4500.00	325210.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	962214.75	3.24	1107761.60	86.9	60.000002	-	125
72 Ge	1194577.50	1.26	1463530.60	81.6	60.000002	-	125
89 Y	2103625.50	0.73	1932167.40	108.9	60.000002	-	125
115 In	1506439.40	1.79	1952569.30	77.2	60.000002	-	125
209 Bi	3821324.30	1.38	4087579.80	93.5	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00890

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\120SMPL.D\120SMPL.D#
Date Acquired: Feb 6 2018 07:47 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020068-018B
Misc Info: 6010.20-S
Vial Number: 1408
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	10.590	2.118	ug/l	6.97	4500.00	4130.00		P
11 B	55.950	11.190	ug/l	3.53	4500.00	14405.55		P
27 Al	137,400.000	27480.000	ug/l	4.83	4500.00	###########		A
47 Ti	1,363.000	272.600	ug/l	3.83	4500.00	129753.30		P
51 V	278.550	55.710	ug/l	3.14	4500.00	366826.59		P
52 Cr	138.400	27.680	ug/l	3.89	4500.00	167950.00		P
53 Cr	290.250	58.050	ug/l	5.05	4500.00	38606.67		P
55 Mn	8,795.000	1759.000	ug/l	3.73	4500.00	12377530.00		A
57 Fe	206,850.000	41370.000	ug/l	3.32	4500.00	6494534.00		A
59 Co	94.550	18.910	ug/l	3.52	4500.00	126076.70		P
60 Ni	155.450	31.090	ug/l	2.95	4500.00	47080.00		P
62 Ni	151.550	30.310	ug/l	6.93	4500.00	7153.33		P
63 Cu	154.750	30.950	ug/l	3.05	4500.00	114926.70		P
65 Cu	155.900	31.180	ug/l	1.78	4500.00	55336.66		P
66 Zn	594.000	118.800	ug/l	3.80	4500.00	130170.10		P
75 As	36.310	7.262	ug/l	5.61	4500.00	10300.63		P
77 Se	438.300	87.660	ug/l	3.49	4500.00	6914.33		P
79 Br	28.885	5.777	ug/l	---	#VALUE!	1750.00		P
82 Se	5.490	1.098	ug/l	5.29	4500.00	156.20		P
88 Sr	1,964.000	392.800	ug/l	4.10	4500.00	3564225.00		A
95 Mo	8.075	1.615	ug/l	7.30	4500.00	3133.33		P
97 Mo	7.275	1.455	ug/l	16.98	4500.00	1816.67		P
98 Mo	7.515	1.503	ug/l	3.45	4500.00	4700.34		P
107 Ag	1.023	0.205	ug/l	4.61	1800.00	1484.44		P
109 Ag	0.893	0.179	ug/l	10.31	1800.00	1263.33		P
111 Cd	2.958	0.592	ug/l	28.96	4500.00	1392.32		P
114 Cd	0.043	0.009	ug/l	591.10	4500.00	188.64		P
118 Sn	29.090	5.818	ug/l	2.39	4500.00	16883.33		P
121 Sb	0.886	0.177	ug/l	6.06	4500.00	1486.33		P
123 Sb	0.949	0.190	ug/l	2.16	4500.00	1186.00		P
135 Ba	1,475.000	295.000	ug/l	1.45	4500.00	239926.70		P
137 Ba	1,449.000	289.800	ug/l	2.26	4500.00	416710.00		P
139 La	359.200	71.840	ug/l	0.95	4500.00	989823.63		A
140 Ce	783.500	156.700	ug/l	1.96	4500.00	2091203.00		A
199 Hg	0.243	0.049	ug/l	12.28	450.00	139.67		P
200 Hg	0.243	0.049	ug/l	24.40	450.00	171.33		P
202 Hg	0.299	0.060	ug/l	9.44	450.00	229.00		P
203 Tl	1.721	0.344	ug/l	12.62	4500.00	2786.67		P
205 Tl	1.893	0.379	ug/l	7.74	4500.00	6753.33		P
206 Pb	167.450	33.490	ug/l	1.71	4500.00	130426.70		P
207 Pb	149.450	29.890	ug/l	2.23	4500.00	106010.00		P
208 Pb	156.850	31.370	ug/l	2.76	4500.00	503076.69		P
232 Th	109.000	21.800	ug/l	2.48	4500.00	369286.69		P
238 U	17.960	3.592	ug/l	3.62	4500.00	66570.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	991734.38	3.47	1107761.60	89.5	60.000002	-	125
72 Ge	1225417.40	3.67	1463530.60	83.7	60.000002	-	125
89 Y	1988012.60	0.99	1932167.40	102.9	60.000002	-	125
115 In	1555243.60	2.02	1952569.30	79.7	60.000002	-	125
209 Bi	3877678.00	2.95	4087579.80	94.9	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00891

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\121SMPL.D\121SMPL.D#
Date Acquired: Feb 6 2018 07:49 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.093	-0.093	ug/l	29.14	4500.00	286.67		P
11 B	-1.171	-1.171	ug/l	4.61	4500.00	2034.44		P
27 Al	35.080	35.080	ug/l	12.99	4500.00	164673.30		P
47 Ti	0.322	0.322	ug/l	53.57	4500.00	343.33		P
51 V	0.018	0.018	ug/l	184.23	4500.00	2842.55		P
52 Cr	-0.248	-0.248	ug/l	17.26	4500.00	10343.33		P
53 Cr	0.585	0.585	ug/l	12.18	4500.00	1196.67		P
55 Mn	3.284	3.284	ug/l	9.48	4500.00	25606.67		P
57 Fe	132.600	132.600	ug/l	7.10	4500.00	46930.00		P
59 Co	-0.088	-0.088	ug/l	15.12	4500.00	1460.00		P
60 Ni	-0.012	-0.012	ug/l	379.33	4500.00	396.67		P
62 Ni	-0.483	-0.483	ug/l	55.31	4500.00	250.00		P
63 Cu	-0.086	-0.086	ug/l	14.16	4500.00	1013.33		P
65 Cu	0.105	0.105	ug/l	140.93	4500.00	776.67		P
66 Zn	0.155	0.155	ug/l	101.22	4500.00	636.30		P
75 As	-0.054	-0.054	ug/l	74.86	4500.00	372.16		P
77 Se	2.368	2.368	ug/l	23.15	4500.00	310.00		P
79 Br	0.164	0.164	ug/l	---	#VALUE!	620.00		P
82 Se	-0.269	-0.269	ug/l	80.44	4500.00	16.00		P
88 Sr	0.466	0.466	ug/l	11.47	4500.00	5646.67		P
95 Mo	-0.128	-0.128	ug/l	8.07	4500.00	240.00		P
97 Mo	-0.171	-0.171	ug/l	4.79	4500.00	150.00		P
98 Mo	-0.165	-0.165	ug/l	5.78	4500.00	287.57		P
107 Ag	-0.089	-0.089	ug/l	4.40	1800.00	182.22		P
109 Ag	-0.082	-0.082	ug/l	2.88	1800.00	156.67		P
111 Cd	0.016	0.016	ug/l	342.03	4500.00	808.11		P
114 Cd	-0.005	-0.005	ug/l	257.43	4500.00	163.15		P
118 Sn	-0.333	-0.333	ug/l	4.65	4500.00	426.67		P
121 Sb	-0.119	-0.119	ug/l	7.55	4500.00	256.00		P
123 Sb	-0.113	-0.113	ug/l	3.52	4500.00	213.67		P
135 Ba	0.508	0.508	ug/l	12.09	4500.00	576.67		P
137 Ba	0.672	0.672	ug/l	13.48	4500.00	1243.33		P
139 La	0.087	0.087	ug/l	23.13	4500.00	1623.33		P
140 Ce	0.166	0.166	ug/l	7.73	4500.00	2716.67		P
199 Hg	-0.009	-0.009	ug/l	70.73	450.00	81.33		P
200 Hg	-0.004	-0.004	ug/l	161.90	450.00	99.00		P
202 Hg	-0.003	-0.003	ug/l	161.47	450.00	111.33		P
203 Tl	-0.112	-0.112	ug/l	2.74	4500.00	616.67		P
205 Tl	-0.074	-0.074	ug/l	19.81	4500.00	1473.33		P
206 Pb	0.695	0.695	ug/l	5.33	4500.00	3633.33		P
207 Pb	0.647	0.647	ug/l	3.91	4500.00	3210.00		P
208 Pb	0.676	0.676	ug/l	5.54	4500.00	14606.67		P
232 Th	-0.174	-0.174	ug/l	12.16	4500.00	3662.22		P
238 U	-0.073	-0.073	ug/l	6.72	4500.00	2123.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	951633.19	0.65	1107761.60	85.9	60.000002	-	125
72 Ge	1231509.90	1.96	1463530.60	84.1	60.000002	-	125
89 Y	1691562.10	1.59	1932167.40	87.5	60.000002	-	125
115 In	1627292.10	0.82	1952569.30	83.3	60.000002	-	125
209 Bi	4122456.50	0.94	4087579.80	100.9	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00892

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\122CCV.D\122CCV.D#
Date Acquired: Feb 6 2018 07:52 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	50.910	ug/l	2.30	50.00	85 - 115	90 - 110	
11 B	49.860	ug/l	1.49	50.00	85 - 115	90 - 110	
27 Al	74.420	ug/l	3.45	50.00	85 - 115	90 - 110	>15%
47 Ti	51.590	ug/l	3.37	50.00	85 - 115	90 - 110	
51 V	53.060	ug/l	1.64	50.00	85 - 115	90 - 110	
52 Cr	52.960	ug/l	2.11	50.00	85 - 115	90 - 110	
53 Cr	53.180	ug/l	3.38	50.00	85 - 115	90 - 110	
55 Mn	55.420	ug/l	1.38	50.00	85 - 115	90 - 110	>10%
57 Fe	1489.000	ug/l	1.87	1300.00	85 - 115	90 - 110	>10%
59 Co	53.270	ug/l	1.98	50.00	85 - 115	90 - 110	
60 Ni	53.130	ug/l	0.54	50.00	85 - 115	90 - 110	
62 Ni	51.390	ug/l	8.18	50.00	85 - 115	90 - 110	
63 Cu	51.740	ug/l	1.06	50.00	85 - 115	90 - 110	
65 Cu	50.290	ug/l	2.33	50.00	85 - 115	90 - 110	
66 Zn	50.100	ug/l	1.27	50.00	85 - 115	90 - 110	
75 As	50.950	ug/l	1.97	50.00	85 - 115	90 - 110	
77 Se	52.930	ug/l	2.07	50.00	85 - 115	90 - 110	
79 Br	0.632	ug/l	28.34	---	#### - ####	#### - ####	
82 Se	51.700	ug/l	1.56	50.00	85 - 115	90 - 110	
88 Sr	51.020	ug/l	2.90	50.00	85 - 115	90 - 110	
95 Mo	52.480	ug/l	2.74	50.00	85 - 115	90 - 110	
97 Mo	52.120	ug/l	2.64	50.00	85 - 115	90 - 110	
98 Mo	51.590	ug/l	4.99	50.00	85 - 115	90 - 110	
107 Ag	20.100	ug/l	1.58	20.00	85 - 115	90 - 110	
109 Ag	20.210	ug/l	2.69	20.00	85 - 115	90 - 110	
111 Cd	50.650	ug/l	2.96	50.00	85 - 115	90 - 110	
114 Cd	51.220	ug/l	2.24	50.00	85 - 115	90 - 110	
118 Sn	52.680	ug/l	2.41	50.00	85 - 115	90 - 110	
121 Sb	52.010	ug/l	2.33	50.00	85 - 115	90 - 110	
123 Sb	52.400	ug/l	2.23	50.00	85 - 115	90 - 110	
135 Ba	54.970	ug/l	2.81	50.00	85 - 115	90 - 110	
137 Ba	53.560	ug/l	2.80	50.00	85 - 115	90 - 110	
139 La	53.030	ug/l	2.00	50.00	85 - 115	90 - 110	
140 Ce	52.710	ug/l	2.46	50.00	85 - 115	90 - 110	
199 Hg	1.058	ug/l	9.49	1.00	85 - 115	90 - 110	
200 Hg	1.083	ug/l	3.78	1.00	85 - 115	90 - 110	
202 Hg	1.081	ug/l	1.88	1.00	85 - 115	90 - 110	
203 Tl	50.950	ug/l	0.29	50.00	85 - 115	90 - 110	
205 Tl	49.810	ug/l	0.66	50.00	85 - 115	90 - 110	
206 Pb	51.470	ug/l	0.41	50.00	85 - 115	90 - 110	
207 Pb	51.310	ug/l	1.90	50.00	85 - 115	90 - 110	
208 Pb	51.090	ug/l	0.67	50.00	85 - 115	90 - 110	
232 Th	49.130	ug/l	1.67	50.00	85 - 115	90 - 110	
238 U	52.170	ug/l	1.16	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	957537.31	0.90	1107761.60	86.4	60 - 125	
72 Ge	1251918.90	0.79	1463530.60	85.5	60 - 125	
89 Y	1700556.40	1.39	1932167.40	88.0	60 - 125	
115 In	1598079.00	1.47	1952569.30	81.8	60 - 125	
209 Bi	4044246.50	1.22	4087579.80	98.9	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

QC Range 1
1 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
3 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00893

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\123SMPL.D\123SMPL.D#
Date Acquired: Feb 6 2018 07:55 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 06 2018 03:13 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.072	-0.072	ug/l	46.68	4500.00	318.89		P
11 B	-1.187	-1.187	ug/l	7.40	4500.00	2008.89		P
27 Al	14.390	14.390	ug/l	5.06	4500.00	70480.00		P
47 Ti	0.270	0.270	ug/l	47.11	4500.00	320.00		P
51 V	0.149	0.149	ug/l	42.04	4500.00	3718.59		P
52 Cr	0.303	0.303	ug/l	52.18	4500.00	13536.67		P
53 Cr	0.229	0.229	ug/l	73.98	4500.00	970.00		P
55 Mn	1.354	1.354	ug/l	6.22	4500.00	12026.67		P
57 Fe	83.650	83.650	ug/l	10.86	4500.00	39456.67		P
59 Co	-0.072	-0.072	ug/l	42.27	4500.00	1573.33		P
60 Ni	0.011	0.011	ug/l	189.15	4500.00	433.33		P
62 Ni	-0.169	-0.169	ug/l	169.51	4500.00	323.33		P
63 Cu	-0.066	-0.066	ug/l	13.64	4500.00	1093.33		P
65 Cu	-0.048	-0.048	ug/l	123.63	4500.00	506.67		P
66 Zn	0.113	0.113	ug/l	102.22	4500.00	593.10		P
75 As	0.009	0.009	ug/l	1004.40	4500.00	458.13		P
77 Se	0.471	0.471	ug/l	12.12	4500.00	163.67		P
79 Br	-0.246	-0.246	ug/l	---	#VALUE!	540.00		P
82 Se	0.091	0.091	ug/l	183.09	4500.00	53.13		P
88 Sr	0.161	0.161	ug/l	21.10	4500.00	2880.00		P
95 Mo	0.123	0.123	ug/l	46.07	4500.00	680.00		P
97 Mo	0.120	0.120	ug/l	79.26	4500.00	466.67		P
98 Mo	0.104	0.104	ug/l	58.16	4500.00	1037.49		P
107 Ag	0.134	0.134	ug/l	27.94	1800.00	1230.00		P
109 Ag	0.146	0.146	ug/l	29.18	1800.00	1177.78		P
111 Cd	-0.019	-0.019	ug/l	110.61	4500.00	771.92		P
114 Cd	-0.015	-0.015	ug/l	93.66	4500.00	139.77		P
118 Sn	0.211	0.211	ug/l	13.91	4500.00	1960.00		P
121 Sb	-0.061	-0.061	ug/l	6.13	4500.00	512.33		P
123 Sb	-0.059	-0.059	ug/l	3.99	4500.00	396.67		P
135 Ba	0.271	0.271	ug/l	33.82	4500.00	376.67		P
137 Ba	0.205	0.205	ug/l	19.42	4500.00	543.33		P
139 La	0.063	0.063	ug/l	17.47	4500.00	1293.33		P
140 Ce	0.086	0.086	ug/l	19.99	4500.00	1606.67		P
199 Hg	0.008	0.008	ug/l	47.28	450.00	103.33		P
200 Hg	0.008	0.008	ug/l	108.07	450.00	119.00		P
202 Hg	0.015	0.015	ug/l	51.51	450.00	152.00		P
203 Tl	0.073	0.073	ug/l	26.74	4500.00	1593.33		P
205 Tl	0.112	0.112	ug/l	4.07	4500.00	3886.67		P
206 Pb	0.287	0.287	ug/l	6.65	4500.00	1983.33		P
207 Pb	0.290	0.290	ug/l	18.66	4500.00	1903.33		P
208 Pb	0.308	0.308	ug/l	7.44	4500.00	8506.67		P
232 Th	0.128	0.128	ug/l	6.27	4500.00	9162.22		P
238 U	-0.030	-0.030	ug/l	65.80	4500.00	2980.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	947597.25	1.54	1107761.60	85.5	60.000002	-	125
72 Ge	1238478.80	2.67	1463530.60	84.6	60.000002	-	125
89 Y	1727318.40	1.64	1932167.40	89.4	60.000002	-	125
115 In	1635245.80	2.76	1952569.30	83.7	60.000002	-	125
209 Bi	4191629.80	0.06	4087579.80	102.5	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-00894

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B06o00.B\124_CCB.D\124_CCB.D#
Date Acquired: Feb 6 2018 07:57 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 06 2018 03:13 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	-0.137	ug/l	6.22	0.09	
11 B	-1.618	ug/l	5.09	1.18	
27 Al	10.190	ug/l	2.05	0.38	Fail
47 Ti	0.047	ug/l	45.48	0.17	
51 V	0.028	ug/l	166.15	0.09	
52 Cr	0.117	ug/l	65.57	0.12	
53 Cr	0.167	ug/l	82.65	0.13	Fail
55 Mn	0.882	ug/l	5.92	0.14	Fail
57 Fe	54.980	ug/l	4.66	4.00	Fail
59 Co	-0.143	ug/l	6.46	0.04	
60 Ni	-0.074	ug/l	72.12	0.08	
62 Ni	0.051	ug/l	1586.60	0.32	
63 Cu	-0.157	ug/l	3.12	0.09	
65 Cu	-0.119	ug/l	28.04	0.22	
66 Zn	-0.053	ug/l	66.10	0.10	
75 As	-0.106	ug/l	19.41	0.12	
77 Se	0.406	ug/l	27.86	1.22	
79 Br	-0.515	ug/l	54.71	#VALUE!	
82 Se	-0.100	ug/l	37.01	0.32	
88 Sr	0.043	ug/l	30.81	0.05	
95 Mo	-0.089	ug/l	20.59	0.05	
97 Mo	-0.153	ug/l	5.53	0.03	
98 Mo	-0.139	ug/l	10.41	0.03	
107 Ag	-0.023	ug/l	24.74	0.09	
109 Ag	-0.031	ug/l	41.74	0.10	
111 Cd	-0.153	ug/l	28.96	0.03	
114 Cd	-0.067	ug/l	30.57	0.03	
118 Sn	-0.184	ug/l	21.31	0.05	
121 Sb	-0.118	ug/l	8.06	0.03	
123 Sb	-0.118	ug/l	3.65	0.04	
135 Ba	0.137	ug/l	23.10	0.09	Fail
137 Ba	0.127	ug/l	7.05	0.08	Fail
139 La	0.029	ug/l	49.23	0.02	Fail
140 Ce	0.050	ug/l	11.94	0.02	Fail
199 Hg	0.007	ug/l	131.06	0.03	
200 Hg	-0.004	ug/l	85.07	0.03	
202 Hg	-0.006	ug/l	31.98	0.03	
203 Tl	-0.009	ug/l	324.09	0.03	
205 Tl	0.027	ug/l	21.41	0.02	Fail
206 Pb	0.097	ug/l	43.61	#VALUE!	
207 Pb	0.093	ug/l	50.07	#VALUE!	
208 Pb	0.101	ug/l	32.04	0.02	Fail
232 Th	-0.128	ug/l	5.29	0.06	
238 U	-0.110	ug/l	6.32	0.02	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	958251.06	0.38	1107761.60	86.5	60 - 125	
72 Ge	1254960.30	2.46	1463530.60	85.7	60 - 125	
89 Y	1704540.30	0.82	1932167.40	88.2	60 - 125	
115 In	1638446.10	2.10	1952569.30	83.9	60 - 125	
209 Bi	4103740.50	1.12	4087579.80	100.4	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B06o00.B\011CALB.D\011CALB.D#

10 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

PREP BATCH REPORT

Prep Batch **118356**
Prep Code: **SPLP-EXT-REG**
Prep Temp **NA °C**
Technician: **Dave A. Hanson**
Batch Units: **ML**
Prep Start Date: **2/8/2018 4:00:00 PM**
Prep End Date: **2/9/2018 8:00:00 AM**

Sample ID	Matrix	pH	Initial Samp Amt	Sol Added	Sol Recovered	Final Vol (mL)	Factor	Balance	Prep Start Date	Prep End Date
MB-118356			2000	0	0	2000	1		2/8/2018	2/9/2018
B18020067-001A	Soil		2000	0	0	2000	1	Bal-B3100P	2/8/2018	2/9/2018
B18020067-002A	Soil		2000	0	0	2000	1	Bal-B3100P	2/8/2018	2/9/2018

Number	Reagent Name	Exp Date
6644	SODIUM CARBONATE ANHYDROUS, POWD	6/28/2021
9596	Sodium Bicarbonate, Powder 0000169636	3/27/2023
9825	TCLP Filters, Acid Washed 400134-7296	11/17/2022

Spk ID	Spike Name	SampType	AmtAdd	Exp Date
HZW180207A	Sodium bicarbonatae/carbonate sol	solution	2000ml	2/7/2019

SPLP Extraction Log Book (Method 1312)

Thermometer: HZWRT8100MAT

Date:	2/8/2018	**Analyst:**	Dave Hanson	**Batch ID(s):**	118356	**Ext. Fluid #1 pH:**		**Date/Time Ext. (Start):**	2/8/18 4:00 PM	**Room Temp (High):**	
pH Rotation Time:	NA	**Rotator ID:**	1	**Rotator RPM:**	29	**Ext. Fluid #2 pH:**		**Date/Time Ext. (Stop):**	2/9/18 8:00 AM	**Room Temp (Low):**	
						Special fluid	9.41			Room Temp (Avg):	22.4

	Lab Number	Sample Type	Sample Amount (g)	Pill Description	Initial pH	Post HCl pH	Post Extraction pH	Extraction Fluid Used	Analyst Requested	Vessel ID	Pressure Check	Additional Comments
1	MB								M			
2	B18020067-001A	100% Solid	100	None	NA	NA	9.34	Special	M	bicaronate (0.0144 M sodium bicarbonate and 0.0028 M sodium carbonate)		
3	B18020067-002A	100% Solid	100	None	NA	NA	9.4	Special	M	bicaronate (0.0144 M sodium bicarbonate and 0.0028 M sodium carbonate)		
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												

Date:	2/8/2018
Time:	8:35 AM

pH Buffer	pH Buffer ID	pH Meter Slope	pH Temp. (°C)
2	PHZW171212A	98.6	17.2
7	PHZW180129A		
10	PHZW170925A		
8	PHZW180123B	7.94	

Date:	2/9/2018
Time:	8:20 AM

pH Buffer	pH Buffer ID	pH Meter Slope	pH Temp. (°C)
2	PHZW171212A	98.6	16.5
7	PHZW180129A		
10	PHZW170925A		
8	PHZW180123B	8.08	

PREP BATCH REPORT

Prep Batch **118409**
Prep Code: **SPLP-PRP-3010**
Prep Temp **97.2 °C**
Technician: **Dita Wijaya**
Batch Units: **ML**
Prep Start Date: **2/12/2018 8:09:39 AM**
Prep End Date: **2/12/2018 3:53:00 PM**

Sample ID	Matrix	pH	Initial Samp Amt	Sol Added	Sol Recovered	Final Vol (mL)	Factor	Balance	Prep Start Date	Prep End Date
MB-118409			50	0	0	50	1		2/12/2018	2/12/2018
Temp taken in F7										
LCS-118409			50	0	0	50	1		2/12/2018	2/12/2018
Tube lot # 1703076										
LCSD-118409			50	0	0	50	1		2/12/2018	2/12/2018
B18020067-001A	Soil		25	0	0	50	2		2/12/2018	2/12/2018
B18020067-001AMS3	Soil		25	0	0	50	2		2/12/2018	2/12/2018
B18020067-002A	Soil		25	0	0	50	2		2/12/2018	2/12/2018
B18020067-002AMS3	Soil		25	0	0	50	2		2/12/2018	2/12/2018

Number	Reagent Name	Exp Date
9755	Nitric Acid Instra Analyzed 0000183840	8/10/2022
9990	Hydrochloric Acid, 36.5-38.0% 0000186764	8/29/2022

Spk ID	Spike Name	SampType	AmtAdd	Exp Date
ME 200.2MS 170	EL-200.2MS	LCS/MS3	0.25 mL	9/6/2018
ME 3010 Ag Spik	3010 Ag Spike	LCS/MS3	0.10 mL	1/3/2019
ME Au Digestion	AUDIGSPK	LCS/MS3	0.25 mL	3/15/2018
ME Ba Stock 170	Ba Stock	LCS/MS3	0.25 mL	7/21/2018
ME ICV-2 170914	EL-MSICV-2	LCS/MS3	0.25 mL	9/15/2018

Energy Laboratories Inc

ANALYTICAL RUN Summary

27-Feb-18

Run ID ICPMS202-B_180214A

Run Start Date: 2/14/2018 12:12:00
Analyst: Jason P. Van Cleave
Ical: 0
Column ID:
Comments: Analysis set-up and reported by JCG. Supervised by JPV

Instrument ID	Description
07J20627	Metals 100-1000 uL Adjustable Pipette
12X5317	Metals 100-1000 uL Adjustable Pipette
15549647	Metals 10-100 uL Adjustable Pipette
15571644	Metals 20-200 uL Adjusatble Pipette
340760037	Metals 100-1000 uL Adjustable Pipette
340760040	Metals 100-1000 uL Adjustable Pipette
340782036	Metals 1-5 mL Adjustable Pipette
440760303	Metals 100-1000 uL Adjustable Pipette
440760412	Metals 100-1000 uL Adjustable Pipette
440780018	Metals 1-5 mL Adjustable Pipette
440780025	Metals 1-5 mL Adjustable Pipette
440780027	Metals 1-5 mL Adjustable Pipette
ICPMS202-B	Agilent 7500a
O33504C	Metals 10-100 uL Adjustable Pipette

Std ID	Std Name	Std Amount	Std Units	Samp Amount	Samp Units	SampType	Expiration Date
ME170822 MSCAL-5A	EL-MSCAL-5A	0.05	ml	5	ml	LFB/MS	9/11/2018
MS ISCAB 171212	ICSAB					ICSAB	8/13/2018
MS171220 QCS	QCS Solution					ICV	3/15/2018
MS180103 LLRV	2017 ICPMS LLRV/LLOQ STOCK	0.05	ml	49.95	ml	LLRV	1/3/2019
MS180104 Spiking Solution	Spiking Solution	0.05	ml	5	ml	LFB/MS	9/1/2018
MS180104 Tune Solution	Tune Solution						7/1/2018
MS180201 202 0.5STD	0.5 mg/L STD for 202					CAL2	9/1/2018
MS180201 202 100STD	100 mg/L STD for 202					CAL5	9/1/2018
MS180201 202 10STD	10 mg/L STD for 202					CAL3	9/1/2018
MS180201 202 CCV	CCV for 202					CAL4/CCV	9/1/2018
MS180212 202 ICSA	ICSA					ICSA	3/29/2018
MS180212 IS Solution	Internal Standard Solution						6/23/2018
MS180212 ULR 2	ULR 2 for ICP-MS					ULR2	9/1/2018
MS180212 ULR 3	ULR 3 for ICP-MS					ULR3	9/28/2018
MS180214 P/A	P/A Factor Solution						9/1/2018

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699429	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 12:12:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

1

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699429	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 12:12:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.000624	0		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000928	0.000928		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.001039	0.001039		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.001178	0.001178		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.001336	0.001336		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.01373	0.01373		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.001449	0.001449		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000189	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000528	0.000528		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.001138	0.001138		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.001189	0.001189		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.004279	0.004279		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.000242	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000982	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.002065	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000154	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.001896	0.001896		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.001274	0.001274		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	-0.000397	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000477	0.000477		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.001087	0.001087		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	-0.001581	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000971	0.000971		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000971	0.000971		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000414	0.000414		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.001999	0.001999		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.001151	0.001151		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000858	0.000858		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.001216	0.001216		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699430	Cal Blank	ICPMS-200.8-W	SAMP		2/14/2018 12:15:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		609356.69	609356.69		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699430	Cal Blank	ICPMS-200.8-W	SAMP		2/14/2018 12:15:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699431	0.5 ppb std	ICPMS-200.8-W	SAMP		2/14/2018 12:18:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		607433.31	607433.31		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699432	10 ppb std	ICPMS-200.8-W	SAMP		2/14/2018 12:20:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		594253.31	594253.31		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699433	50 ppb std	ICPMS-200.8-W	SAMP		2/14/2018 12:23:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		588073.31	588073.31		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699434	100 ppb std	ICPMS-200.8-W	SAMP		2/14/2018 12:26:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		576190	576190		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699435	100 ppb Br std	ICPMS-200.8-W	SAMP		2/14/2018 12:28:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		583766.69	583766.69		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699437	QCS	ICPMS-200.8-W ICV			2/14/2018 12:31:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.2554	0.2554		0.25	0	0	0.0002849	0.1	4.5	102%	90	110	0%	
Antimony	A	mg/L	0.04975	0.04975		0.05	0	0	3.047E-05	0.05	18	100%	90	110	0%	
Arsenic	A	mg/L	0.04998	0.04998		0.05	0	0	6.629E-05	0.005	18	100%	90	110	0%	
Barium	A	mg/L	0.04815	0.04815		0.05	0	0	6.437E-05	0.1	18	96%	90	110	0%	
Beryllium	A	mg/L	0.02555	0.02555		0.025	0	0	8.97E-06	0.001	4.5	102%	90	110	0%	
Boron	A	mg/L	0.05045	0.05045		0.05	0	0	0.00141	0.1	4.5	101%	90	110	0%	
Cadmium	A	mg/L	0.02514	0.02514		0.025	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.04998	0.04998		0.05	0	0	2.257E-05	0.001	4.5	100%	90	110	0%	
Chromium	A	mg/L	0.05094	0.05094		0.05	0	0	5.576E-05	0.01	18	102%	90	110	0%	
Cobalt	A	mg/L	0.05152	0.05152		0.05	0	0	3.904E-05	0.01	18	103%	90	110	0%	
Copper	A	mg/L	0.05262	0.05262		0.05	0	0	7.681E-05	0.01	4.5	105%	90	110	0%	
Iron	A	mg/L	0.2593	0.2593		0.25	0	0	0.000175	0.02	4.5	104%	90	110	0%	
Lanthanum	A	mg/L	0.04998	0.04998		0.05	0	0	0.0000111	0.001	4.5	100%	90	110	0%	
Lead	A	mg/L	0.05044	0.05044		0.05	0	0	2.956E-05	0.01	18	101%	90	110	0%	
Manganese	A	mg/L	0.2594	0.2594		0.25	0	0	3.649E-05	0.01	18	104%	90	110	0%	
Mercury	A	mg/L	0.002086	0.002086		0.002	0	0	1.289E-05	0.001	0.36	104%	90	110	0%	
Molybdenum	A	mg/L	0.04783	0.04783		0.05	0	0	2.302E-05	0.005	9	96%	90	110	0%	
Nickel	A	mg/L	0.05236	0.05236		0.05	0	0	7.128E-05	0.01	4.5	105%	90	110	0%	
Selenium	A	mg/L	0.05249	0.05249		0.05	0	0	0.0001532	0.005	18	105%	90	110	0%	
Silver	A	mg/L	0.02557	0.02557		0.025	0	0	2.959E-05	0.005	1.8	102%	90	110	0%	
Strontium	A	mg/L	0.04979	0.04979		0.05	0	0	1.229E-05	0.1	18	100%	90	110	0%	
Thallium	A	mg/L	0.05054	0.05054		0.05	0	0	1.434E-05	0.1	18	101%	90	110	0%	
Thorium	A	mg/L	0.02177	0.02177		0.02	0	0	5.767E-05	0.001	4.5	109%	90	110	0%	
Thorium 232	A	mg/L	0.02177	0.02177		0.02	0	0	5.767E-05	0.01	4.5	109%	90	110	0%	
Tin	A	mg/L	0.05019	0.05019		0.05	0	0	5.199E-05	0.1	9	100%	90	110	0%	
Titanium	A	mg/L	0.05143	0.05143		0.05	0	0	0.0001736	0.01	18	103%	90	110	0%	
Uranium	A	mg/L	0.01955	0.01955		0.02	0	0	1.332E-05	0.001	4.5	98%	90	110	0%	
Vanadium	A	mg/L	0.04947	0.04947		0.05	0	0	7.351E-05	0.1	18	99%	90	110	0%	
Zinc	A	mg/L	0.05261	0.05261		0.05	0	0	0.0002495	0.01	4.5	105%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699438	CCV	ICPMS-200.8-W CCV			2/14/2018 12:34:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699438	CCV	ICPMS-200.8-W	CCV		2/14/2018 12:34:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04886	0.04886		0.05	0	0	0.0002849	0.1	4.5	98%	90	110	0%	
Antimony	A	mg/L	0.04863	0.04863		0.05	0	0	3.047E-05	0.05	18	97%	90	110	0%	
Arsenic	A	mg/L	0.04957	0.04957		0.05	0	0	6.629E-05	0.005	18	99%	90	110	0%	
Barium	A	mg/L	0.04729	0.04729		0.05	0	0	6.437E-05	0.1	18	95%	90	110	0%	
Beryllium	A	mg/L	0.04965	0.04965		0.05	0	0	8.97E-06	0.001	4.5	99%	90	110	0%	
Boron	A	mg/L	0.04836	0.04836		0.05	0	0	0.00141	0.1	4.5	97%	90	110	0%	
Cadmium	A	mg/L	0.04888	0.04888		0.05	0	0	1.468E-05	0.001	18	98%	90	110	0%	
Cerium	A	mg/L	0.04954	0.04954		0.05	0	0	2.257E-05	0.001	4.5	99%	90	110	0%	
Chromium	A	mg/L	0.04925	0.04925		0.05	0	0	5.576E-05	0.01	18	99%	90	110	0%	
Cobalt	A	mg/L	0.05037	0.05037		0.05	0	0	3.904E-05	0.01	18	101%	90	110	0%	
Copper	A	mg/L	0.05089	0.05089		0.05	0	0	7.681E-05	0.01	4.5	102%	90	110	0%	
Iron	A	mg/L	1.3	1.3		1.3	0	0	0.000175	0.02	4.5	100%	90	110	0%	
Lanthanum	A	mg/L	0.04904	0.04904		0.05	0	0	0.0000111	0.001	4.5	98%	90	110	0%	
Lead	A	mg/L	0.04952	0.04952		0.05	0	0	2.956E-05	0.01	18	99%	90	110	0%	
Manganese	A	mg/L	0.05014	0.05014		0.05	0	0	3.649E-05	0.01	18	100%	90	110	0%	
Mercury	A	mg/L	0.001075	0.001075		0.001	0	0	1.289E-05	0.001	0.36	107%	90	110	0%	
Molybdenum	A	mg/L	0.04993	0.04993		0.05	0	0	2.302E-05	0.005	9	100%	90	110	0%	
Nickel	A	mg/L	0.04949	0.04949		0.05	0	0	7.128E-05	0.01	4.5	99%	90	110	0%	
Selenium	A	mg/L	0.04994	0.04994		0.05	0	0	0.0001532	0.005	18	100%	90	110	0%	
Silver	A	mg/L	0.01997	0.01997		0.02	0	0	2.959E-05	0.005	1.8	100%	90	110	0%	
Strontium	A	mg/L	0.04958	0.04958		0.05	0	0	1.229E-05	0.1	18	99%	90	110	0%	
Thallium	A	mg/L	0.04987	0.04987		0.05	0	0	1.434E-05	0.1	18	100%	90	110	0%	
Thorium	A	mg/L	0.04737	0.04737		0.05	0	0	5.767E-05	0.001	4.5	95%	90	110	0%	
Thorium 232	A	mg/L	0.04737	0.04737		0.05	0	0	5.767E-05	0.01	4.5	95%	90	110	0%	
Tin	A	mg/L	0.04996	0.04996		0.05	0	0	5.199E-05	0.1	9	100%	90	110	0%	
Titanium	A	mg/L	0.05088	0.05088		0.05	0	0	0.0001736	0.01	18	102%	90	110	0%	
Uranium	A	mg/L	0.04914	0.04914		0.05	0	0	1.332E-05	0.001	4.5	98%	90	110	0%	
Vanadium	A	mg/L	0.04971	0.04971		0.05	0	0	7.351E-05	0.1	18	99%	90	110	0%	
Zinc	A	mg/L	0.04965	0.04965		0.05	0	0	0.0002495	0.01	4.5	99%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699440	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 12:36:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699440	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 12:36:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000184	0.000184		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	-0.000007	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000019	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00007	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002349	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000034	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000073	0.000073		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000071	0.000071		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000024	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000023	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.003873	0.003873		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000064	0.000064		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	-0.000024	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000012	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000017	0.000017		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000414	0.000414		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	-0.000044	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000047	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000209	0.000209		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	-0.000006	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.000051	0.000051		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000458	0.000458		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000458	0.000458		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.00097	0.00097		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	-0.000049	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000029	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000036	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000318	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699441	CCB	ICPMS-200.8-W	CCB		2/14/2018 12:39:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699441	CCB	ICPMS-200.8-W	CCB		2/14/2018 12:39:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.001056	-0.001056		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000037	0.000037		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000023	-0.000023		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000072	-0.000072		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00008	-0.00008		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002494	-0.002494		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000055	-0.000055		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000037	0.000037		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000049	0.000049		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000068	-0.000068		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000022	-0.000022		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.004014	0.004014		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000041	0.000041		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000054	-0.000054		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.00005	-0.00005		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000016	0.000016		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000087	0.000087		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000086	-0.000086		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000146	-0.000146		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000081	0.000081		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.00005	-0.00005		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000025	-0.000025		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000182	0.000182		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000182	0.000182		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000422	0.000422		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000064	-0.000064		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000061	-0.000061		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000155	-0.000155		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699442	LRB	ICPMS-200.8-W	MBLK		2/14/2018 12:42:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699442	LRB	ICPMS-200.8-W	MBLK		2/14/2018 12:42:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.000899	0		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000016	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000026	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000075	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000092	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002943	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000059	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000027	0.000027		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000008	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000065	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000119	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.002807	0.002807		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000027	0.000027		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000074	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.00007	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000006	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000051	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000122	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000052	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000021	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000044	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000057	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000054	0		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000054	0		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000255	0.000255		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000126	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.00007	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000028	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000198	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699444	LLRV	ICPMS-200.8-W	CRI		2/14/2018 12:44:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699444	LLRV	ICPMS-200.8-W CRI			2/14/2018 12:44:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.009566	0.009566		0.01	0	0	0.0002849	0.1	4.5	96%	80	120	0%	
Antimony	A	mg/L	0.000341	0.000341		0.0005	0	0	3.047E-05	0.05	18	68%	80	120	0%	S
Arsenic	A	mg/L	0.000915	0.000915		0.001	0	0	6.629E-05	0.005	18	92%	80	120	0%	
Barium	A	mg/L	0.000195	0.000195		0.0003	0	0	6.437E-05	0.1	18	65%	80	120	0%	S
Beryllium	A	mg/L	0.000457	0.000457		0.0005	0	0	8.97E-06	0.001	4.5	91%	80	120	0%	
Boron	A	mg/L	-0.001	-0.001		0.002	0	0	0.00141	0.1	4.5	-50%	80	120	0%	S
Cadmium	A	mg/L	0.000119	0.000119		0.0002	0	0	1.468E-05	0.001	18	60%	80	120	0%	S
Cerium	A	mg/L	0.000211	0.000211		0.0002	0	0	2.257E-05	0.001	4.5	106%	80	120	0%	
Chromium	A	mg/L	0.001126	0.001126		0.001	0	0	5.576E-05	0.01	18	113%	80	120	0%	
Cobalt	A	mg/L	0.000126	0.000126		0.0002	0	0	3.904E-05	0.01	18	63%	80	120	0%	S
Copper	A	mg/L	0.002053	0.002053		0.002	0	0	7.681E-05	0.01	4.5	103%	80	120	0%	
Iron	A	mg/L	0.001655	0.001655		0.0005	0	0	0.000175	0.02	4.5	331%	80	120	0%	S
Lanthanum	A	mg/L	0.000216	0.000216		0.0002	0	0	0.0000111	0.001	4.5	108%	80	120	0%	
Lead	A	mg/L	0.000447	0.000447		0.0005	0	0	2.956E-05	0.01	18	89%	80	120	0%	
Manganese	A	mg/L	0.00038	0.00038		0.0005	0	0	3.649E-05	0.01	18	76%	80	120	0%	S
Mercury	A	mg/L	0.000961	0.000961		0.001	0	0	1.289E-05	0.001	0.36	96%	80	120	0%	
Molybdenum	A	mg/L	0.000407	0.000407		0.0005	0	0	2.302E-05	0.005	9	81%	80	120	0%	
Nickel	A	mg/L	0.002112	0.002112		0.002	0	0	7.128E-05	0.01	4.5	106%	80	120	0%	
Selenium	A	mg/L	0.001708	0.001708		0.002	0	0	0.0001532	0.005	18	85%	80	120	0%	
Silver	A	mg/L	0.000124	0.000124		0.0002	0	0	2.959E-05	0.005	1.8	62%	80	120	0%	S
Strontium	A	mg/L	0.000432	0.000432		0.0005	0	0	1.229E-05	0.1	18	86%	80	120	0%	
Thallium	A	mg/L	0.000624	0.000624		0.0005	0	0	1.434E-05	0.1	18	125%	80	120	0%	S
Thorium	A	mg/L	0.005704	0.005704		0.01	0	0	5.767E-05	0.001	4.5	57%	80	120	0%	S
Thorium 232	A	mg/L	0.005704	0.005704		0.01	0	0	5.767E-05	0.01	4.5	57%	70	130	0%	S
Tin	A	mg/L	0.001146	0.001146		0.001	0	0	5.199E-05	0.1	9	115%	80	120	0%	
Titanium	A	mg/L	0.000767	0.000767		0.001	0	0	0.0001736	0.01	18	77%	80	120	0%	S
Uranium	A	mg/L	0.000408	0.000408		0.0005	0	0	1.332E-05	0.001	4.5	82%	80	120	0%	
Vanadium	A	mg/L	0.001954	0.001954		0.002	0	0	7.351E-05	0.1	18	98%	80	120	0%	
Zinc	A	mg/L	0.006318	0.006318		0.005	0	0	0.0002495	0.01	4.5	126%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699445	LFB	ICPMS-200.8-W LFB			2/14/2018 12:47:	1.02	R294811		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699445	LFB	ICPMS-200.8-W	LFB		2/14/2018 12:47:	1.02	R294811		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04611	0.0470322		0.05	0	0	0.0002906	0.1	4.5	94%	85	115	0%	
Antimony	A	mg/L	0.04713	0.0480726		0.05	0	0	3.108E-05	0.05	18	96%	85	115	0%	
Arsenic	A	mg/L	0.04734	0.0482868		0.05	0	0	6.762E-05	0.005	18	97%	85	115	0%	
Barium	A	mg/L	0.04686	0.0477972		0.05	0	0	6.566E-05	0.1	18	96%	85	115	0%	
Beryllium	A	mg/L	0.04853	0.0495006		0.05	0	0	9.149E-06	0.001	4.5	99%	85	115	0%	
Boron	A	mg/L	0.04515	0.046053		0.05	0	0	0.0014382	0.1	4.5	92%	85	115	0%	
Cadmium	A	mg/L	0.04707	0.0480114		0.05	0	0	1.497E-05	0.001	18	96%	85	115	0%	
Cerium	A	mg/L	0.04832	0.0492864		0.05	0.000027	0	2.302E-05	0.001	4.5	99%	85	115	0%	
Chromium	A	mg/L	0.04894	0.0499188		0.05	0	0	5.688E-05	0.01	18	100%	85	115	0%	
Cobalt	A	mg/L	0.04848	0.0494496		0.05	0	0	3.982E-05	0.01	18	99%	85	115	0%	
Copper	A	mg/L	0.04692	0.0478584		0.05	0	0	7.835E-05	0.01	4.5	96%	85	115	0%	
Iron	A	mg/L	4.759	4.85418		5	0.002807	0	0.0001785	0.02	4.5	97%	85	115	0%	
Lanthanum	A	mg/L	0.04783	0.0487866		0.05	0.000027	0	1.132E-05	0.001	4.5	98%	85	115	0%	
Lead	A	mg/L	0.04854	0.0495108		0.05	0	0	3.015E-05	0.01	18	99%	85	115	0%	
Manganese	A	mg/L	0.04815	0.049113		0.05	0	0	3.722E-05	0.01	18	98%	85	115	0%	
Mercury	A	mg/L	0.001059	0.00108018		0.001	0	0	1.315E-05	0.001	0.36	108%	85	115	0%	
Molybdenum	A	mg/L	0.0478	0.048756		0.05	0	0	2.348E-05	0.005	9	98%	85	115	0%	
Nickel	A	mg/L	0.0481	0.049062		0.05	0	0	7.271E-05	0.01	4.5	98%	85	115	0%	
Selenium	A	mg/L	0.04614	0.0470628		0.05	0	0	0.0001563	0.005	18	94%	85	115	0%	
Silver	A	mg/L	0.01902	0.0194004		0.02	0	0	3.018E-05	0.005	1.8	97%	85	115	0%	
Strontium	A	mg/L	0.04795	0.048909		0.05	0	0	1.254E-05	0.1	18	98%	85	115	0%	
Thallium	A	mg/L	0.04869	0.0496638		0.05	0	0	1.463E-05	0.1	18	99%	85	115	0%	
Thorium	A	mg/L	0.05086	0.0518772		0.05	0	0	5.882E-05	0.001	4.5	104%	85	115	0%	
Thorium 232	A	mg/L	0.05086	0.0518772		0.05	0	0	5.882E-05	0.01	4.5	104%	85	115	0%	
Tin	A	mg/L	0.04831	0.0492762		0.05	0.000255	0	5.303E-05	0.1	9	98%	85	115	0%	
Titanium	A	mg/L	0.05497	0.0560694		0.05	0	0	0.0001771	0.01	18	112%	85	115	0%	
Uranium	A	mg/L	0.04816	0.0491232		0.05	0	0	1.359E-05	0.001	4.5	98%	85	115	0%	
Vanadium	A	mg/L	0.04904	0.0500208		0.05	0	0	7.498E-05	0.1	18	100%	85	115	0%	
Zinc	A	mg/L	0.04738	0.0483276		0.05	0	0	0.0002545	0.01	4.5	97%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699446	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 12:49:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699446	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 12:49:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000116	0.000116		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	-0.000019	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000075	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000073	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.003077	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000059	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000042	0.000042		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000002	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000033	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.0001	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.008194	0.008194		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000046	0.000046		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	-0.000014	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000094	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000016	0.000016		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000338	0.000338		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	-0.000097	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000057	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000181	0.000181		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	-0.000055	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.000472	0.000472		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000405	0.000405		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000405	0.000405		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000659	0.000659		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000113	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000052	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000022	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000311	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699447	ICSA	ICPMS-200.8-W	ICSA		2/14/2018 12:52:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699447	ICSA	ICPMS-200.8-W	ICSA		2/14/2018 12:52:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	40.28	40.28		40	0	0	0.0002849	0.1	4.5	101%	70	130	0%	
Antimony	A	mg/L	0.00013	0.00013		0	0	0	3.047E-05	0.05	18	0%			0%	
Arsenic	A	mg/L	0.00003	0.00003		0	0	0	6.629E-05	0.005	18	0%			0%	
Barium	A	mg/L	-0.00002	-0.00002		0	0	0	6.437E-05	0.1	18	0%			0%	
Beryllium	A	mg/L	-0.00009	-0.00009		0	0	0	8.97E-06	0.001	4.5	0%			0%	
Boron	A	mg/L	-0.00261	-0.00261		0	0	0	0.00141	0.1	4.5	0%			0%	
Cadmium	A	mg/L	-0.00005	-0.00005		0	0	0	1.468E-05	0.001	18	0%			0%	
Cerium	A	mg/L	0.00004	0.00004		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.00134	0.00134		0	0	0	5.576E-05	0.01	18	0%			0%	
Cobalt	A	mg/L	0.00001	0.00001		0	0	0	3.904E-05	0.01	18	0%			0%	
Copper	A	mg/L	0.00088	0.00088		0	0	0	7.681E-05	0.01	4.5	0%			0%	
Iron	A	mg/L	91.28	91.28		100	0	0	0.000175	0.02	4.5	91%	70	130	0%	
Lanthanum	A	mg/L	0.00003	0.00003		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.00069	0.00069		0	0	0	2.956E-05	0.01	18	0%			0%	
Manganese	A	mg/L	0.00013	0.00013		0	0	0	3.649E-05	0.01	18	0%			0%	
Mercury	A	mg/L	0.00002	0.00002		0	0	0	1.289E-05	0.001	0.36	0%			0%	
Molybdenum	A	mg/L	0.8218	0.8218		0.8	0	0	2.302E-05	0.005	9	103%	70	130	0%	
Nickel	A	mg/L	0.00098	0.00098		0	0	0	7.128E-05	0.01	4.5	0%			0%	
Selenium	A	mg/L	-0.00001	-0.00001		0	0	0	0.0001532	0.005	18	0%			0%	
Silver	A	mg/L	0.00017	0.00017		0	0	0	2.959E-05	0.005	1.8	0%			0%	
Strontium	A	mg/L	0.00043	0.00043		0	0	0	1.229E-05	0.1	18	0%			0%	
Thallium	A	mg/L	0.00053	0.00053		0	0	0	1.434E-05	0.1	18	0%			0%	
Thorium	A	mg/L	0.00496	0.00496		0	0	0	5.767E-05	0.001	4.5	0%			0%	
Thorium 232	A	mg/L	0.00496	0.00496		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.00047	0.00047		0	0	0	5.199E-05	0.1	9	0%			0%	
Titanium	A	mg/L	0.8429	0.8429		0.8	0	0	0.0001736	0.01	18	105%			0%	
Uranium	A	mg/L	-0.00007	-0.00007		0	0	0	1.332E-05	0.001	4.5	0%			0%	
Vanadium	A	mg/L	0.00009	0.00009		0	0	0	7.351E-05	0.1	18	0%			0%	
Zinc	A	mg/L	0.00154	0.00154		0	0	0	0.0002495	0.01	4.5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699449	ICSAB	ICPMS-200.8-W	ICSAB		2/14/2018 12:55:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699449	ICSAB	ICPMS-200.8-W	ICSAB		2/14/2018 12:55:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	42.25	42.25		40	0	0	0.0002849	0.1	4.5	106%	70	130	0%	
Antimony	A	mg/L	0.00007	0.00007		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.0101	0.0101		0.01	0	0	6.629E-05	0.005	18	101%	70	130	0%	
Barium	A	mg/L	0	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.0001	-0.0001		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.00047	-0.00047		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.00977	0.00977		0.01	0	0	1.468E-05	0.001	18	98%	70	130	0%	
Cerium	A	mg/L	0.00005	0.00005		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.02198	0.02198		0.02	0	0	5.576E-05	0.01	18	110%	70	130	0%	
Cobalt	A	mg/L	0.021	0.021		0.02	0	0	3.904E-05	0.01	18	105%	70	130	0%	
Copper	A	mg/L	0.0204	0.0204		0.02	0	0	7.681E-05	0.01	4.5	102%	70	130	0%	
Iron	A	mg/L	94.5	94.5		100	0	0	0.000175	0.02	4.5	95%	70	130	0%	
Lanthanum	A	mg/L	0.00003	0.00003		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.00074	0.00074		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.02111	0.02111		0.02	0	0	3.649E-05	0.01	18	106%	70	130	0%	
Mercury	A	mg/L	0.00001	0.00001		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.8449	0.8449		0.8	0	0	2.302E-05	0.005	9	106%	70	130	0%	
Nickel	A	mg/L	0.02184	0.02184		0.02	0	0	7.128E-05	0.01	4.5	109%	70	130	0%	
Selenium	A	mg/L	0.00949	0.00949		0.01	0	0	0.0001532	0.005	18	95%	70	130	0%	
Silver	A	mg/L	0.02063	0.02063		0.02	0	0	2.959E-05	0.005	1.8	103%	70	130	0%	
Strontium	A	mg/L	0.00045	0.00045		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.00034	0.00034		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.00275	0.00275		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.00275	0.00275		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.00027	0.00027		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.8628	0.8628		0.8	0	0	0.0001736	0.01	18	108%	70	130	0%	
Uranium	A	mg/L	-0.00009	-0.00009		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.02069	0.02069		0.02	0	0	7.351E-05	0.1	18	103%	70	130	0%	
Zinc	A	mg/L	0.01115	0.01115		0.01	0	0	0.0002495	0.01	4.5	112%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699450	ULR3	ICPMS-6020-W-	ULR3		2/14/2018 12:57:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699450	ULR3	ICPMS-6020-W-	ULR3		2/14/2018 12:57:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04166	0.04166		0	0	0	0.0002849	0.001	5	0%	0	0	0%	
Antimony	A	mg/L	5.025	5.025		5	0	0	3.047E-05	0.001	5	101%	90	110	0%	
Arsenic	A	mg/L	0.000082	0.000082		0	0	0	6.629E-05	0.001	5	0%	0	0	0%	
Barium	A	mg/L	0.001533	0.001533		0	0	0	6.437E-05	0.001	5	0%	0	0	0%	
Beryllium	A	mg/L	-0.000001	0		0	0	0	8.97E-06	0.001	5	0%	0	0	0%	
Boron	A	mg/L	-0.002811	0		0	0	0	0.00141	0.00141	5	0%	0	0	0%	
Cadmium	A	mg/L	0.000206	0.000206		0	0	0	5.635E-05	0.001	5	0%	0	0	0%	
Cerium	A	mg/L	0.000027	0.000027		0	0	0		0.001		0%	0	0	0%	
Chromium	A	mg/L	0.000121	0.000121		0	0	0	5.576E-05	0.001	5	0%	0	0	0%	
Cobalt	A	mg/L	0.000159	0.000159		0	0	0	3.904E-05	0.001	5	0%	0	0	0%	
Copper	A	mg/L	0.001286	0.001286		0	0	0	7.681E-05	0.001	5	0%	0	0	0%	
Iron	A	mg/L	0.1085	0.1085		0	0	0	0.000175	0.001	10	0%	0	0	0%	
Lead	A	mg/L	0.000169	0.000169		0	0	0	2.956E-05	0.001	5	0%	0	0	0%	
Manganese	A	mg/L	-0.000011	0		0	0	0	3.649E-05	0.001	5	0%	0	0	0%	
Mercury	A	mg/L	-0.000002	0		0	0	0	1.289E-05	0.001	0.5	0%	0	0	0%	
Molybdenum	A	mg/L	5.164	5.164		5	0	0	2.302E-05	0.001	5	103%	90	110	0%	
Nickel	A	mg/L	0.000625	0.000625		0	0	0	7.128E-05	0.001	5	0%	0	0	0%	
Selenium	A	mg/L	-0.000021	0		0	0	0	0.0001532	0.001	5	0%	0	0	0%	
Silver	A	mg/L	0.000016	0		0	0	0	2.959E-05	0.001	1	0%	0	0	0%	
Strontium	A	mg/L	0.000041	0.000041		0	0	0	1.229E-05	0.001	5	0%	0	0	0%	
Thallium	A	mg/L	0.001575	0.001575		0	0	0	1.434E-05	0.001	5	0%	0	0	0%	
Thorium	A	mg/L	0.008307	0.008307		0	0	0	5.767E-05	0.001	5	0%	0	0	0%	
Tin	A	mg/L	5.404	5.404		5	0	0	5.199E-05	0.001	5	108%	90	110	0%	
Titanium	A	mg/L	5.311	5.311		5	0	0	0.0001736	0.001	5	106%	90	110	0%	
Uranium	A	mg/L	0.000008	0		0	0	0	1.332E-05	0.0003	5	0%	0	0	0%	
Vanadium	A	mg/L	0.000047	0		0	0	0	7.351E-05	0.001	5	0%	0	0	0%	
Zinc	A	mg/L	0.000922	0.000922		0	0	0	0.0002495	0.001	5	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.1085	0.1085		0	0	0	0.000175	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699452	ULR2	ICPMS-6020-W-	ULR2		2/14/2018 1:00:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699452	ULR2	ICPMS-6020-W-	ULR2		2/14/2018 1:00:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	5.798	5.798		5	0	0	0.0002849	0.001	5	116%	90	110	0%	S
Antimony	A	mg/L	0.01942	0.01942		0	0	0	3.047E-05	0.001	5	0%	0	0	0%	
Arsenic	A	mg/L	5.101	5.101		5	0	0	6.629E-05	0.001	5	102%	90	110	0%	
Barium	A	mg/L	4.806	4.806		5	0	0	6.437E-05	0.001	5	96%	90	110	0%	
Beryllium	A	mg/L	5.206	5.206		5	0	0	8.97E-06	0.001	5	104%	90	110	0%	
Boron	A	mg/L	6.342	6.342		5	0	0	0.00141	0.00141	5	127%	90	110	0%	S
Cadmium	A	mg/L	4.98	4.98		5	0	0	5.635E-05	0.001	5	100%	90	110	0%	
Cerium	A	mg/L	0.000031	0.000031		0	0	0		0.001		0%	0	0	0%	
Chromium	A	mg/L	5.249	5.249		5	0	0	5.576E-05	0.001	5	105%	90	110	0%	
Cobalt	A	mg/L	5.318	5.318		5	0	0	3.904E-05	0.001	5	106%	90	110	0%	
Copper	A	mg/L	5.408	5.408		5	0	0	7.681E-05	0.001	5	108%	90	110	0%	
Iron	A	mg/L	5.205	5.205		5	0	0	0.000175	0.001	10	104%	90	110	0%	
Lead	A	mg/L	5.021	5.021		5	0	0	2.956E-05	0.001	5	100%	90	110	0%	
Manganese	A	mg/L	5.362	5.362		5	0	0	3.649E-05	0.001	5	107%	90	110	0%	
Mercury	A	mg/L	0.000026	0.000026		0	0	0	1.289E-05	0.001	0.5	0%	0	0	0%	
Molybdenum	A	mg/L	0.01275	0.01275		0	0	0	2.302E-05	0.001	5	0%	0	0	0%	
Nickel	A	mg/L	5.277	5.277		5	0	0	7.128E-05	0.001	5	106%	90	110	0%	
Selenium	A	mg/L	5.417	5.417		5	0	0	0.0001532	0.001	5	108%	90	110	0%	
Silver	A	mg/L	2.087	2.087		2	0	0	2.959E-05	0.001	1	104%	90	110	0%	
Strontium	A	mg/L	5.215	5.215		5	0	0	1.229E-05	0.001	5	104%	90	110	0%	
Thallium	A	mg/L	5.032	5.032		5	0	0	1.434E-05	0.001	5	101%	90	110	0%	
Thorium	A	mg/L	5.136	5.136		5	0	0	5.767E-05	0.001	5	103%	90	110	0%	
Tin	A	mg/L	0.01747	0.01747		0	0	0	5.199E-05	0.001	5	0%	0	0	0%	
Titanium	A	mg/L	0.006015	0.006015		0	0	0	0.0001736	0.001	5	0%	0	0	0%	
Uranium	A	mg/L	4.887	4.887		5	0	0	1.332E-05	0.0003	5	98%	90	110	0%	
Vanadium	A	mg/L	5.224	5.224		5	0	0	7.351E-05	0.001	5	104%	90	110	0%	
Zinc	A	mg/L	5.222	5.222		5	0	0	0.0002495	0.001	5	104%	90	110	0%	
Iron, Ferrous	C	mg/L	5.205	5.205		0	0	0	0.000175	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699453	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:02:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699453	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:02:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.002846	0.002846		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.004198	0.004198		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.002926	0.002926		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.003078	0.003078		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.03452	0.03452		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	J
Cerium	A	mg/L	0.000002	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.003115	0.003115		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.003275	0.003275		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.003256	0.003256		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000005	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.00406	0.00406		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.003304	0.003304		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000001	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.003911	0.003911		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.003119	0.003119		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.005115	0.005115		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.001688	0.001688		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.003144	0.003144		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.004382	0.004382		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.0105	0.0105		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.0105	0.0105		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.002906	0.002906		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.002933	0.002933		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Vanadium	A	mg/L	0.003038	0.003038		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.003222	0.003222		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699454	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:05:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.00164	0.00164		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.001983	0.001983		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.001697	0.001697		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Boron	A	mg/L	0.007097	0.007097		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	J
Cerium	A	mg/L	0.000002	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699454	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:05:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.00165	0.00165		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.001759	0.001759		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.001609	0.001609		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000004	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.002121	0.002121		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.001681	0.001681		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000008	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.002102	0.002102		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.00161	0.00161		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.001961	0.001961		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000907	0.000907		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.001664	0.001664		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.003384	0.003384		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.001529	0.001529		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.001541	0.001541		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Vanadium	A	mg/L	0.001661	0.001661		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.001659	0.001659		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699455	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:08:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.001181	0.001181		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.0012	0.0012		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000962	0.000962		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Boron	A	mg/L	0.003199	0.003199		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	J
Cerium	A	mg/L	0	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.001163	0.001163		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.001125	0.001125		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.00105	0.00105		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000003	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.00139	0.00139		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.001105	0.001105		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000001	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.001432	0.001432		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699455	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:08:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/L	0.001068	0.001068		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.001415	0.001415		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000563	0.000563		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.001054	0.001054		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.002951	0.002951		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.001037	0.001037		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000865	0.000865		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000987	0.000987		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.001068	0.001068		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000896	0.000896		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699457	CCV	ICPMS-200.8-W	CCV		2/14/2018 1:10:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.05717	0.05717		0.05	0	0	0.0002849	0.1	4.5	114%	90	110	0%	S
Antimony	A	mg/L	0.04965	0.04965		0.05	0	0	3.047E-05	0.05	18	99%	90	110	0%	
Arsenic	A	mg/L	0.05053	0.05053		0.05	0	0	6.629E-05	0.005	18	101%	90	110	0%	
Barium	A	mg/L	0.04926	0.04926		0.05	0	0	6.437E-05	0.1	18	99%	90	110	0%	
Beryllium	A	mg/L	0.05031	0.05031		0.05	0	0	8.97E-06	0.001	4.5	101%	90	110	0%	
Boron	A	mg/L	0.05151	0.05151		0.05	0	0	0.00141	0.1	4.5	103%	90	110	0%	
Cadmium	A	mg/L	0.05064	0.05064		0.05	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.04972	0.04972		0.05	0	0	2.257E-05	0.001	4.5	99%	90	110	0%	
Chromium	A	mg/L	0.05025	0.05025		0.05	0	0	5.576E-05	0.01	18	100%	90	110	0%	
Cobalt	A	mg/L	0.05124	0.05124		0.05	0	0	3.904E-05	0.01	18	102%	90	110	0%	
Copper	A	mg/L	0.05122	0.05122		0.05	0	0	7.681E-05	0.01	4.5	102%	90	110	0%	
Iron	A	mg/L	1.317	1.317		1.3	0	0	0.000175	0.02	4.5	101%	90	110	0%	
Lanthanum	A	mg/L	0.04938	0.04938		0.05	0	0	0.0000111	0.001	4.5	99%	90	110	0%	
Lead	A	mg/L	0.05084	0.05084		0.05	0	0	2.956E-05	0.01	18	102%	90	110	0%	
Manganese	A	mg/L	0.05101	0.05101		0.05	0	0	3.649E-05	0.01	18	102%	90	110	0%	
Mercury	A	mg/L	0.001082	0.001082		0.001	0	0	1.289E-05	0.001	0.36	108%	90	110	0%	
Molybdenum	A	mg/L	0.05044	0.05044		0.05	0	0	2.302E-05	0.005	9	101%	90	110	0%	
Nickel	A	mg/L	0.05095	0.05095		0.05	0	0	7.128E-05	0.01	4.5	102%	90	110	0%	
Selenium	A	mg/L	0.0518	0.0518		0.05	0	0	0.0001532	0.005	18	104%	90	110	0%	
Silver	A	mg/L	0.01995	0.01995		0.02	0	0	2.959E-05	0.005	1.8	100%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699457	CCV	ICPMS-200.8-W CCV			2/14/2018 1:10:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium	A	mg/L	0.05018	0.05018		0.05	0	0	1.229E-05	0.1	18	100%	90	110	0%	
Thallium	A	mg/L	0.05322	0.05322		0.05	0	0	1.434E-05	0.1	18	106%	90	110	0%	
Thorium	A	mg/L	0.055	0.055		0.05	0	0	5.767E-05	0.001	4.5	110%	90	110	0%	
Thorium 232	A	mg/L	0.055	0.055		0.05	0	0	5.767E-05	0.01	4.5	110%	90	110	0%	
Tin	A	mg/L	0.0505	0.0505		0.05	0	0	5.199E-05	0.1	9	101%	90	110	0%	
Titanium	A	mg/L	0.05161	0.05161		0.05	0	0	0.0001736	0.01	18	103%	90	110	0%	
Uranium	A	mg/L	0.04977	0.04977		0.05	0	0	1.332E-05	0.001	4.5	100%	90	110	0%	
Vanadium	A	mg/L	0.05028	0.05028		0.05	0	0	7.351E-05	0.1	18	101%	90	110	0%	
Zinc	A	mg/L	0.05187	0.05187		0.05	0	0	0.0002495	0.01	4.5	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699458	Rinse	ICPMS-200.8-W SAMP			2/14/2018 1:13:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000756	0.000756		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000661	0.000661		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.00048	0.00048		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000552	0.000552		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	-0.000179	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000517	0.000517		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000041	0.000041		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000629	0.000629		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000615	0.000615		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000625	0.000625		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.01512	0.01512		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000038	0.000038		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000827	0.000827		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000621	0.000621		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000007	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000946	0.000946		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000539	0.000539		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.00086	0.00086		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.00047	0.00047		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000562	0.000562		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.002791	0.002791		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699458	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:13:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.001111	0.001111		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000609	0.000609		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000551	0.000551		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.00058	0.00058		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000313	0.000313		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699459	CCB	ICPMS-200.8-W	CCB		2/14/2018 1:15:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.00156	0.00156		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000447	0.000447		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000381	0.000381		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000291	0.000291		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000303	0.000303		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000178	-0.000178		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.00036	0.00036		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000015	0.000015		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000437	0.000437		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	0.000345	0.000345		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000324	0.000324		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.008281	0.008281		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000022	0.000022		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000553	0.000553		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000387	0.000387		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000007	-0.000007		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000486	0.000486		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000292	0.000292		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000481	0.000481		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000237	0.000237		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000334	0.000334		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.002395	0.002395		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000735	0.000735		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000735	0.000735		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000548	0.000548		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699459	CCB	ICPMS-200.8-W	CCB		2/14/2018 1:15:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Titanium	A	mg/L	0.000207	0.000207		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000313	0.000313		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000353	0.000353		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000259	0.000259		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699461	QCS	ICPMS-6020-W-	ICV		2/14/2018 12:31:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.2554	0.2554		0.25	0	0	0.0002849	0.001	4.5	102%	90	110	0%	
Antimony	A	mg/L	0.04975	0.04975		0.05	0	0	3.047E-05	0.001	18	100%	90	110	0%	
Arsenic	A	mg/L	0.04998	0.04998		0.05	0	0	6.629E-05	0.001	18	100%	90	110	0%	
Barium	A	mg/L	0.04815	0.04815		0.05	0	0	6.437E-05	0.001	18	96%	90	110	0%	
Beryllium	A	mg/L	0.02555	0.02555		0.025	0	0	8.97E-06	0.001	4.5	102%	90	110	0%	
Boron	A	mg/L	0.05045	0.05045		0.05	0	0	0.00141	0.00141	4.5	101%	90	110	0%	
Cadmium	A	mg/L	0.02514	0.02514		0.025	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.04998	0.04998		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.05094	0.05094		0.05	0	0	5.576E-05	0.001	18	102%	90	110	0%	
Cobalt	A	mg/L	0.05152	0.05152		0.05	0	0	3.904E-05	0.001	18	103%	90	110	0%	
Copper	A	mg/L	0.05262	0.05262		0.05	0	0	7.681E-05	0.001	4.5	105%	90	110	0%	
Iron	A	mg/L	0.2593	0.2593		0.25	0	0	0.000175	0.001	4.5	104%	90	110	0%	
Lanthanum	A	mg/L	0.04998	0.04998		0.05	0	0	0.0000111	0.001	4.5	100%	90	110	0%	
Lead	A	mg/L	0.05044	0.05044		0.05	0	0	2.956E-05	0.001	18	101%	90	110	0%	
Manganese	A	mg/L	0.2594	0.2594		0.25	0	0	3.649E-05	0.001	18	104%	90	110	0%	
Mercury	A	mg/L	0.002086	0.002086		0.002	0	0	1.289E-05	0.001	0.36	104%	90	110	0%	
Molybdenum	A	mg/L	0.04783	0.04783		0.05	0	0	2.302E-05	0.001	9	96%	90	110	0%	
Nickel	A	mg/L	0.05236	0.05236		0.05	0	0	7.128E-05	0.001	4.5	105%	90	110	0%	
Selenium	A	mg/L	0.05249	0.05249		0.05	0	0	0.0001532	0.001	18	105%	90	110	0%	
Silver	A	mg/L	0.02557	0.02557		0.025	0	0	2.959E-05	0.001	1.8	102%	90	110	0%	
Strontium	A	mg/L	0.04979	0.04979		0.05	0	0	1.229E-05	0.001	18	100%	90	110	0%	
Thallium	A	mg/L	0.05054	0.05054		0.05	0	0	1.434E-05	0.001	18	101%	90	110	0%	
Thorium	A	mg/L	0.02177	0.02177		0.02	0	0	5.767E-05	0.001	4.5	109%	90	110	0%	
Tin	A	mg/L	0.05019	0.05019		0.05	0	0	5.199E-05	0.001	9	100%	90	110	0%	
Titanium	A	mg/L	0.05143	0.05143		0.05	0	0	0.0001736	0.001	18	103%	90	110	0%	
Uranium	A	mg/L	0.01955	0.01955		0.02	0	0	1.332E-05	0.0003	4.5	98%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699461	QCS	ICPMS-6020-W-	ICV		2/14/2018 12:31:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	0.04947	0.04947		0.05	0	0	7.351E-05	0.001	18	99%	90	110	0%	
Zinc	A	mg/L	0.05261	0.05261		0.05	0	0	0.0002495	0.001	4.5	105%	90	110	0%	
Iron, Ferrous	C	mg/L	0.2593	0.2593		0	0	0	0.000175	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699462	LRB	ICPMS-6020-W-	MBLK		2/14/2018 12:42:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.000899	0		0	0	0	0.0002849	0.001	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000016	0		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000026	0		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	A	mg/L	-0.000075	0		0	0	0	6.437E-05	0.001	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000092	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002943	0		0	0	0	0.00141	0.00141	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000059	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000027	0.000027		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000008	0		0	0	0	5.576E-05	0.001	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000065	0		0	0	0	3.904E-05	0.001	18	0%	0	0	0%	
Copper	A	mg/L	-0.000119	0		0	0	0	7.681E-05	0.001	4.5	0%	0	0	0%	
Iron	A	mg/L	0.002807	0.002807		0	0	0	0.000175	0.001	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000027	0.000027		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000074	0		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	
Manganese	A	mg/L	-0.00007	0		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	
Mercury	A	mg/L	0.000006	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000051	0		0	0	0	2.302E-05	0.001	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000122	0		0	0	0	7.128E-05	0.001	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000052	0		0	0	0	0.0001532	0.001	18	0%	0	0	0%	
Silver	A	mg/L	0.000021	0		0	0	0	2.959E-05	0.001	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000044	0		0	0	0	1.229E-05	0.001	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000057	0		0	0	0	1.434E-05	0.001	18	0%	0	0	0%	
Thorium	A	mg/L	0.000054	0		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000255	0.000255		0	0	0	5.199E-05	0.001	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000126	0		0	0	0	0.0001736	0.001	18	0%	0	0	0%	
Uranium	A	mg/L	-0.00007	0		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000028	0		0	0	0	7.351E-05	0.001	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699462	LRB	ICPMS-6020-W-	MBLK		2/14/2018 12:42:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/L	-0.000198	0		0	0	0	0.0002495	0.001	4.5	0%	0	0	0%	
Iron, Ferrous	C	mg/L	0.002807	0.002807		0	0	0	0.000175	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699463	LLRV	ICPMS-6020-W-	CRI		2/14/2018 12:44:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.009566	0.009566		0.01	0	0	0.0002849	0.001	4.5	96%	80	120	0%	
Antimony	A	mg/L	0.000341	0.000341		0.0005	0	0	3.047E-05	0.001	18	68%	80	120	0%	S
Arsenic	A	mg/L	0.000915	0.000915		0.001	0	0	6.629E-05	0.001	18	92%	80	120	0%	
Barium	A	mg/L	0.000195	0.000195		0.0003	0	0	6.437E-05	0.001	18	65%	80	120	0%	S
Beryllium	A	mg/L	0.000457	0.000457		0.0005	0	0	8.97E-06	0.001	4.5	91%	80	120	0%	
Boron	A	mg/L	-0.001	-0.001		0.002	0	0	0.00141	0.00141	4.5	-50%	80	120	0%	S
Cadmium	A	mg/L	0.000119	0.000119		0.0002	0	0	1.468E-05	0.001	18	60%	80	120	0%	S
Cerium	A	mg/L	0.000211	0.000211		0.0002	0	0	2.257E-05	0.001	4.5	106%	80	120	0%	
Chromium	A	mg/L	0.001126	0.001126		0.001	0	0	5.576E-05	0.001	18	113%	80	120	0%	
Cobalt	A	mg/L	0.000126	0.000126		0.0002	0	0	3.904E-05	0.001	18	63%	80	120	0%	S
Copper	A	mg/L	0.002053	0.002053		0.002	0	0	7.681E-05	0.001	4.5	103%	80	120	0%	
Iron	A	mg/L	0.001655	0.001655		0.0005	0	0	0.000175	0.001	4.5	331%	80	120	0%	S
Lanthanum	A	mg/L	0.000216	0.000216		0.0002	0	0	0.0000111	0.001	4.5	108%	80	120	0%	
Lead	A	mg/L	0.000447	0.000447		0.0005	0	0	2.956E-05	0.001	18	89%	80	120	0%	
Manganese	A	mg/L	0.00038	0.00038		0.0005	0	0	3.649E-05	0.001	18	76%	80	120	0%	S
Mercury	A	mg/L	0.000961	0.000961		0.001	0	0	1.289E-05	0.001	0.36	96%	80	120	0%	
Molybdenum	A	mg/L	0.000407	0.000407		0.0005	0	0	2.302E-05	0.001	9	81%	80	120	0%	
Nickel	A	mg/L	0.002112	0.002112		0.002	0	0	7.128E-05	0.001	4.5	106%	80	120	0%	
Selenium	A	mg/L	0.001708	0.001708		0.002	0	0	0.0001532	0.001	18	85%	80	120	0%	
Silver	A	mg/L	0.000124	0.000124		0.0002	0	0	2.959E-05	0.001	1.8	62%	80	120	0%	S
Strontium	A	mg/L	0.000432	0.000432		0.0005	0	0	1.229E-05	0.001	18	86%	80	120	0%	
Thallium	A	mg/L	0.000624	0.000624		0.0005	0	0	1.434E-05	0.001	18	125%	80	120	0%	S
Thorium	A	mg/L	0.005704	0.005704		0.01	0	0	5.767E-05	0.001	4.5	57%	80	120	0%	S
Tin	A	mg/L	0.001146	0.001146		0.001	0	0	5.199E-05	0.001	9	115%	80	120	0%	
Titanium	A	mg/L	0.000767	0.000767		0.001	0	0	0.0001736	0.001	18	77%	80	120	0%	S
Uranium	A	mg/L	0.000408	0.000408		0.0005	0	0	1.332E-05	0.0003	4.5	82%	80	120	0%	
Vanadium	A	mg/L	0.001954	0.001954		0.002	0	0	7.351E-05	0.001	18	98%	80	120	0%	
Zinc	A	mg/L	0.006318	0.006318		0.005	0	0	0.0002495	0.001	4.5	126%	80	120	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699463	LLRV	ICPMS-6020-W-	CRI		2/14/2018 12:44:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Iron, Ferrous	C	mg/L	0.001655	0.001655		0	0	0	0.000175	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699464	LFB	ICPMS-6020-W-	LFB		2/14/2018 12:47:	1.02	R294811		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04611	0.0470322		0.05	0	0	0.0002906	0.001	4.5	94%	85	115	0%	
Antimony	A	mg/L	0.04713	0.0480726		0.05	0	0	3.108E-05	0.001	18	96%	85	115	0%	
Arsenic	A	mg/L	0.04734	0.0482868		0.05	0	0	6.762E-05	0.001	18	97%	85	115	0%	
Barium	A	mg/L	0.04686	0.0477972		0.05	0	0	6.566E-05	0.001	18	96%	85	115	0%	
Beryllium	A	mg/L	0.04853	0.0495006		0.05	0	0	9.149E-06	0.001	4.5	99%	85	115	0%	
Boron	A	mg/L	0.04515	0.046053		0.05	0	0	0.0014382	0.0014382	4.5	92%	85	115	0%	
Cadmium	A	mg/L	0.04707	0.0480114		0.05	0	0	1.497E-05	0.001	18	96%	85	115	0%	
Cerium	A	mg/L	0.04832	0.0492864		0	0.000027	0	2.302E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.04894	0.0499188		0.05	0	0	5.688E-05	0.001	18	100%	85	115	0%	
Cobalt	A	mg/L	0.04848	0.0494496		0.05	0	0	3.982E-05	0.001	18	99%	85	115	0%	
Copper	A	mg/L	0.04692	0.0478584		0.05	0	0	7.835E-05	0.001	4.5	96%	85	115	0%	
Iron	A	mg/L	4.759	4.85418		5.05	0.002807	0	0.0001785	0.001	4.5	96%	85	115	0%	
Lanthanum	A	mg/L	0.04783	0.0487866		0.05	0.000027	0	1.132E-05	0.001	4.5	98%	85	115	0%	
Lead	A	mg/L	0.04854	0.0495108		0.05	0	0	3.015E-05	0.001	18	99%	85	115	0%	
Manganese	A	mg/L	0.04815	0.049113		0.05	0	0	3.722E-05	0.001	18	98%	85	115	0%	
Mercury	A	mg/L	0.001059	0.00108018		0.001	0	0	1.315E-05	0.001	0.36	108%	85	115	0%	
Molybdenum	A	mg/L	0.0478	0.048756		0.05	0	0	2.348E-05	0.001	9	98%	85	115	0%	
Nickel	A	mg/L	0.0481	0.049062		0.05	0	0	7.271E-05	0.001	4.5	98%	85	115	0%	
Selenium	A	mg/L	0.04614	0.0470628		0.05	0	0	0.0001563	0.001	18	94%	85	115	0%	
Silver	A	mg/L	0.01902	0.0194004		0.02	0	0	3.018E-05	0.001	1.8	97%	85	115	0%	
Strontium	A	mg/L	0.04795	0.048909		0.05	0	0	1.254E-05	0.001	18	98%	85	115	0%	
Thallium	A	mg/L	0.04869	0.0496638		0.05	0	0	1.463E-05	0.001	18	99%	85	115	0%	
Thorium	A	mg/L	0.05086	0.0518772		0.05	0	0	5.882E-05	0.001	4.5	104%	85	115	0%	
Tin	A	mg/L	0.04831	0.0492762		0.05	0.000255	0	5.303E-05	0.001	9	98%	85	115	0%	
Titanium	A	mg/L	0.05497	0.0560694		0.05	0	0	0.0001771	0.001	18	112%	85	115	0%	
Uranium	A	mg/L	0.04816	0.0491232		0.05	0	0	1.359E-05	0.0003	4.5	98%	85	115	0%	
Vanadium	A	mg/L	0.04904	0.0500208		0.05	0	0	7.498E-05	0.001	18	100%	85	115	0%	
Zinc	A	mg/L	0.04738	0.0483276		0.05	0	0	0.0002545	0.001	4.5	97%	85	115	0%	
Iron, Ferrous	C	mg/L	4.759	4.85418		0	0.002807	0	0.0001785	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699464	LFB	ICPMS-6020-W-	LFB		2/14/2018 12:47:	1.02	R294811		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699465	ICSA	ICPMS-6020-W-	ICSA		2/14/2018 12:52:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	40.28	40.28		40	0	0	0.0002849	0.001	4.5	101%	70	130	0%	
Antimony	A	mg/L	0.00013	0.00013		0	0	0	3.047E-05	0.001	18	0%			0%	
Arsenic	A	mg/L	0.00003	0.00003		0	0	0	6.629E-05	0.001	18	0%			0%	
Barium	A	mg/L	-0.00002	-0.00002		0	0	0	6.437E-05	0.001	18	0%			0%	
Beryllium	A	mg/L	-0.00009	-0.00009		0	0	0	8.97E-06	0.001	4.5	0%			0%	
Boron	A	mg/L	-0.00261	-0.00261		0	0	0	0.00141	0.00141	4.5	0%			0%	
Cadmium	A	mg/L	-0.00005	-0.00005		0	0	0	1.468E-05	0.001	18	0%			0%	
Cerium	A	mg/L	0.00004	0.00004		0	0	0	2.257E-05	0.001	4.5	0%			0%	
Chromium	A	mg/L	0.00134	0.00134		0	0	0	5.576E-05	0.001	18	0%			0%	
Cobalt	A	mg/L	0.00001	0.00001		0	0	0	3.904E-05	0.001	18	0%			0%	
Copper	A	mg/L	0.00088	0.00088		0	0	0	7.681E-05	0.001	4.5	0%			0%	
Iron	A	mg/L	91.28	91.28		100	0	0	0.000175	0.001	4.5	91%	70	130	0%	
Lanthanum	A	mg/L	0.00003	0.00003		0	0	0	0.0000111	0.001	4.5	0%			0%	
Lead	A	mg/L	0.00069	0.00069		0	0	0	2.956E-05	0.001	18	0%			0%	
Manganese	A	mg/L	0.00013	0.00013		0	0	0	3.649E-05	0.001	18	0%			0%	
Mercury	A	mg/L	0.00002	0.00002		0	0	0	1.289E-05	0.001	0.36	0%			0%	
Molybdenum	A	mg/L	0.8218	0.8218		0.8	0	0	2.302E-05	0.001	9	103%	70	130	0%	
Nickel	A	mg/L	0.00098	0.00098		0	0	0	7.128E-05	0.001	4.5	0%			0%	
Selenium	A	mg/L	-0.00001	-0.00001		0	0	0	0.0001532	0.001	18	0%			0%	
Silver	A	mg/L	0.00017	0.00017		0	0	0	2.959E-05	0.001	1.8	0%			0%	
Strontium	A	mg/L	0.00043	0.00043		0	0	0	1.229E-05	0.001	18	0%			0%	
Thallium	A	mg/L	0.00053	0.00053		0	0	0	1.434E-05	0.001	18	0%			0%	
Thorium	A	mg/L	0.00496	0.00496		0	0	0	5.767E-05	0.001	4.5	0%			0%	
Tin	A	mg/L	0.00047	0.00047		0	0	0	5.199E-05	0.001	9	0%			0%	
Titanium	A	mg/L	0.8429	0.8429		0.8	0	0	0.0001736	0.001	18	105%			0%	
Uranium	A	mg/L	-0.00007	-0.00007		0	0	0	1.332E-05	0.0003	4.5	0%			0%	
Vanadium	A	mg/L	0.00009	0.00009		0	0	0	7.351E-05	0.001	18	0%			0%	
Zinc	A	mg/L	0.00154	0.00154		0	0	0	0.0002495	0.001	4.5	0%			0%	
Iron, Ferrous	C	mg/L	91.28	91.28		0	0	0	0.000175	0.001	5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699466	ICSAB	ICPMS-6020-W-	ICSAB		2/14/2018 12:55:	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	42.25	42.25		40	0	0	0.0002849	0.001	4.5	106%	70	130	0%	
Antimony	A	mg/L	0.00007	0.00007		0	0	0	3.047E-05	0.001	18	0%			0%	
Arsenic	A	mg/L	0.0101	0.0101		0.01	0	0	6.629E-05	0.001	18	101%	70	130	0%	
Barium	A	mg/L	0	0		0	0	0	6.437E-05	0.001	18	0%			0%	
Beryllium	A	mg/L	-0.0001	-0.0001		0	0	0	8.97E-06	0.001	4.5	0%			0%	
Boron	A	mg/L	-0.00047	-0.00047		0	0	0	0.00141	0.00141	4.5	0%			0%	
Cadmium	A	mg/L	0.00977	0.00977		0.01	0	0	1.468E-05	0.001	18	98%	70	130	0%	
Cerium	A	mg/L	0.00005	0.00005		0	0	0	2.257E-05	0.001	4.5	0%			0%	
Chromium	A	mg/L	0.02198	0.02198		0.02	0	0	5.576E-05	0.001	18	110%	70	130	0%	
Cobalt	A	mg/L	0.021	0.021		0.02	0	0	3.904E-05	0.001	18	105%	70	130	0%	
Copper	A	mg/L	0.0204	0.0204		0.02	0	0	7.681E-05	0.001	4.5	102%	70	130	0%	
Iron	A	mg/L	94.5	94.5		100	0	0	0.000175	0.001	4.5	95%	70	130	0%	
Lanthanum	A	mg/L	0.00003	0.00003		0	0	0	0.0000111	0.001	4.5	0%			0%	
Lead	A	mg/L	0.00074	0.00074		0	0	0	2.956E-05	0.001	18	0%			0%	
Manganese	A	mg/L	0.02111	0.02111		0.02	0	0	3.649E-05	0.001	18	106%	70	130	0%	
Mercury	A	mg/L	0.00001	0.00001		0	0	0	1.289E-05	0.001	0.36	0%			0%	
Molybdenum	A	mg/L	0.8449	0.8449		0.8	0	0	2.302E-05	0.001	9	106%	70	130	0%	
Nickel	A	mg/L	0.02184	0.02184		0.02	0	0	7.128E-05	0.001	4.5	109%	70	130	0%	
Selenium	A	mg/L	0.00949	0.00949		0.01	0	0	0.0001532	0.001	18	95%	70	130	0%	
Silver	A	mg/L	0.02063	0.02063		0.02	0	0	2.959E-05	0.001	1.8	103%	70	130	0%	
Strontium	A	mg/L	0.00045	0.00045		0	0	0	1.229E-05	0.001	18	0%			0%	
Thallium	A	mg/L	0.00034	0.00034		0	0	0	1.434E-05	0.001	18	0%			0%	
Thorium	A	mg/L	0.00275	0.00275		0	0	0	5.767E-05	0.001	4.5	0%			0%	
Tin	A	mg/L	0.00027	0.00027		0	0	0	5.199E-05	0.001	9	0%			0%	
Titanium	A	mg/L	0.8628	0.8628		0.8	0	0	0.0001736	0.001	18	108%	70	130	0%	
Uranium	A	mg/L	-0.00009	-0.00009		0	0	0	1.332E-05	0.0003	4.5	0%			0%	
Vanadium	A	mg/L	0.02069	0.02069		0.02	0	0	7.351E-05	0.001	18	103%	70	130	0%	
Zinc	A	mg/L	0.01115	0.01115		0.01	0	0	0.0002495	0.001	4.5	112%	70	130	0%	
Iron, Ferrous	C	mg/L	94.5	94.5		0	0	0	0.000175	0.001	5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699490	B18020773-001	200.7.8-W-DW	SAMP		2/14/2018 1:18:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699490	B18020773-001	200.7.8-W-DW	SAMP		2/14/2018 1:18:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.00078	0.00078		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000467	0.000467		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	J
Barium	A	mg/L	0.04238	0.04238		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000195	0.000195		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	0.01928	0.01928		0	0	0	0.00141	0.05	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000188	0.000188		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Chromium	A	mg/L	0.003468	0.003468		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000238	0.000238		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	J
Copper	A	mg/L	0.009958	0.009958		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000465	0.000465		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000006	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.004727	0.004727		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000592	0.000592		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000347	0.000347		0	0	0	0.0001532	0.001	18	0%	0	0	0%	J
Silver	A	mg/L	0.000094	0.000094		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	J
Strontium	A	mg/L	0.15	0.15		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.000172	0.000172		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000507	0.000507		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Uranium	A	mg/L	0.00329	0.00329		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.001072	0.001072		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.003129	0.003129		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J
Uranium, Activity	C	pCi/L	2.2043	2.2043		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699491	B18020773-001	200.7.8-W-DW	MS		2/14/2018 1:21:0	1.02	R294811		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0512	0.052224		0.05	0.001502	0	0.0002906	0.03	4.5	101%	70	130	0%	
Antimony	A	mg/L	0.04939	0.0503778		0.05	0.00078	0	3.108E-05	0.001	18	99%	70	130	0%	
Arsenic	A	mg/L	0.05116	0.0521832		0.05	0.000467	0	6.762E-05	0.001	18	103%	70	130	0%	
Barium	A	mg/L	0.09035	0.092157		0.05	0.04238	0	6.566E-05	0.05	18	100%	70	130	0%	
Beryllium	A	mg/L	0.04809	0.0490518		0.05	0.000195	0	9.149E-06	0.001	4.5	98%	70	130	0%	
Boron	A	mg/L	0.0669	0.068238		0.05	0.01928	0	0.0014382	0.05	4.5	98%	70	130	0%	
Cadmium	A	mg/L	0.04795	0.048909		0.05	0.000188	0	1.497E-05	0.001	18	97%	70	130	0%	
Chromium	A	mg/L	0.05093	0.0519486		0.05	0.003468	0	5.688E-05	0.005	18	97%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699491	B18020773-001	200.7.8-W-DW	MS		2/14/2018 1:21:0	1.02	R294811		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cobalt	A	mg/L	0.04817	0.0491334		0.05	0.000238	0	3.982E-05	0.005	18	98%	70	130	0%	
Copper	A	mg/L	0.05616	0.0572832		0.05	0.009958	0	7.835E-05	0.005	4.5	95%	70	130	0%	
Lead	A	mg/L	0.04951	0.0505002		0.05	0.000465	0	3.015E-05	0.001	18	100%	70	130	0%	
Manganese	A	mg/L	0.04922	0.0502044		0.05	0.001376	0	3.722E-05	0.001	18	98%	70	130	0%	
Mercury	A	mg/L	0.001065	0.0010863		0.001	0	0	1.315E-05	0.0001	0.36	109%	70	130	0%	
Molybdenum	A	mg/L	0.05326	0.0543252		0.05	0.004727	0	2.348E-05	0.005	9	99%	70	130	0%	
Nickel	A	mg/L	0.04864	0.0496128		0.05	0.000592	0	7.271E-05	0.01	4.5	98%	70	130	0%	
Selenium	A	mg/L	0.05216	0.0532032		0.05	0.000347	0	0.0001563	0.001	18	106%	70	130	0%	
Silver	A	mg/L	0.01869	0.0190638		0.02	0.000094	0	3.018E-05	0.001	0.1	95%	70	130	0%	
Strontium	A	mg/L	0.1911	0.194922		0.05	0.15	0	1.254E-05	0.01	18	90%	70	130	0%	
Thallium	A	mg/L	0.04987	0.0508674		0.05	0.001687	0	1.463E-05	0.0005	18	98%	70	130	0%	
Thorium	A	mg/L	0.05097	0.0519894		0.05	0.000314	0	5.882E-05	0.005	4.5	103%	70	130	0%	
Thorium 232	A	mg/L	0.05097	0.0519894		0.05	0.000314	0	5.882E-05	0.005	4.5	103%	70	130	0%	
Tin	A	mg/L	0.04712	0.0480624		0.05	0.000172	0	5.303E-05	0.05	9	96%	70	130	0%	
Titanium	A	mg/L	0.05476	0.0558552		0.05	0.000507	0	0.0001771	0.005	18	111%	70	130	0%	
Uranium	A	mg/L	0.05249	0.0535398		0.05	0.00329	0	1.359E-05	0.0003	4.5	100%	70	130	0%	
Vanadium	A	mg/L	0.04927	0.0502554		0.05	0.001072	0	7.498E-05	0.01	18	98%	70	130	0%	
Zinc	A	mg/L	0.04976	0.0507552		0.05	0.003129	0	0.0002545	0.01	4.5	95%	70	130	0%	
Uranium, Activity	C	pCi/L	35.1683	35.871666		0	2.2043	0	0.0091029	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699492	B18020773-001	200.7.8-W-DW	MSD		2/14/2018 1:23:0	1.02	R294811		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0513	0.052326		0.05	0.001502	0.052224	0.0002906	0.03	4.5	102%	70	130	0%	
Antimony	A	mg/L	0.04888	0.0498576		0.05	0.00078	0.0503778	3.108E-05	0.001	18	98%	70	130	1%	
Arsenic	A	mg/L	0.05073	0.0517446		0.05	0.000467	0.0521832	6.762E-05	0.001	18	103%	70	130	1%	
Barium	A	mg/L	0.08894	0.0907188		0.05	0.04238	0.092157	6.566E-05	0.05	18	97%	70	130	2%	
Beryllium	A	mg/L	0.04841	0.0493782		0.05	0.000195	0.0490518	9.149E-06	0.001	4.5	98%	70	130	1%	
Boron	A	mg/L	0.06775	0.069105		0.05	0.01928	0.068238	0.0014382	0.05	4.5	100%	70	130	1%	
Cadmium	A	mg/L	0.04737	0.0483174		0.05	0.000188	0.048909	1.497E-05	0.001	18	96%	70	130	1%	
Chromium	A	mg/L	0.05149	0.0525198		0.05	0.003468	0.0519486	5.688E-05	0.005	18	98%	70	130	1%	
Cobalt	A	mg/L	0.0491	0.050082		0.05	0.000238	0.0491334	3.982E-05	0.005	18	100%	70	130	2%	
Copper	A	mg/L	0.05653	0.0576606		0.05	0.009958	0.0572832	7.835E-05	0.005	4.5	95%	70	130	1%	
Lead	A	mg/L	0.04999	0.0509898		0.05	0.000465	0.0505002	3.015E-05	0.001	18	101%	70	130	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699492	B18020773-001	200.7.8-W-DW	MSD		2/14/2018 1:23:0	1.02	R294811		1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	mg/L	0.05013	0.0511326		0.05	0.001376	0.0502044	3.722E-05	0.001	18	100%	70	130	2%	
Mercury	A	mg/L	0.001119	0.00114138		0.001	0	0.0010863	1.315E-05	0.0001	0.36	114%	70	130	5%	
Molybdenum	A	mg/L	0.05392	0.0549984		0.05	0.004727	0.0543252	2.348E-05	0.005	9	101%	70	130	1%	
Nickel	A	mg/L	0.04844	0.0494088		0.05	0.000592	0.0496128	7.271E-05	0.01	4.5	98%	70	130	0%	
Selenium	A	mg/L	0.05277	0.0538254		0.05	0.000347	0.0532032	0.0001563	0.001	18	107%	70	130	1%	
Silver	A	mg/L	0.01903	0.0194106		0.02	0.000094	0.0190638	3.018E-05	0.001	0.1	97%	70	130	2%	
Strontium	A	mg/L	0.1912	0.195024		0.05	0.15	0.194922	1.254E-05	0.01	18	90%	70	130	0%	
Thallium	A	mg/L	0.05018	0.0511836		0.05	0.001687	0.0508674	1.463E-05	0.0005	18	99%	70	130	1%	
Thorium	A	mg/L	0.05243	0.0534786		0.05	0.000314	0.0519894	5.882E-05	0.005	4.5	106%	70	130	3%	
Thorium 232	A	mg/L	0.05243	0.0534786		0.05	0.000314	0.0519894	5.882E-05	0.005	4.5	106%	70	130	3%	
Tin	A	mg/L	0.04774	0.0486948		0.05	0.000172	0.0480624	5.303E-05	0.05	9	97%	70	130		
Titanium	A	mg/L	0.05561	0.0567222		0.05	0.000507	0.0558552	0.0001771	0.005	18	112%	70	130	2%	
Uranium	A	mg/L	0.05305	0.054111		0.05	0.00329	0.0535398	1.359E-05	0.0003	4.5	102%	70	130	1%	
Vanadium	A	mg/L	0.04923	0.0502146		0.05	0.001072	0.0502554	7.498E-05	0.01	18	98%	70	130	0%	
Zinc	A	mg/L	0.05	0.051		0.05	0.003129	0.0507552	0.0002545	0.01	4.5	96%	70	130	0%	
Uranium, Activity	C	pCi/L	35.5435	36.25437		0	2.2043	35.871666	0.0091029	0.201	1000	0%	0	0	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699493	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:26:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000372	0.000372		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.00007	0.00007		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.000078	0.000078		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000003	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001644	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000012	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000062	0.000062		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000193	0.000193		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000055	0.000055		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000037	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.00006	0.00006		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000206	0.000206		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.00009	0.00009		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000005	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699493	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:26:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	A	mg/L	0.000821	0.000821		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000006	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.00021	0.00021		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000263	0.000263		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000195	0.000195		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.00192	0.00192		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.001206	0.001206		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000101	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000046	0.000046		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000062	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000188	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699494	B18020773-002	200.7.8-W-DW	SAMP		2/14/2018 1:29:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000751	0.000751		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000041	0		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	A	mg/L	0.04195	0.04195		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000059	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.01934	0.01934		0	0	0	0.00141	0.05	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	-0.000088	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.003677	0.003677		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000009	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.0107	0.0107		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000251	0.000251		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000013	0		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	
Mercury	A	mg/L	0.000014	0.000014		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.001424	0.001424		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000367	0.000367		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000216	0.000216		0	0	0	0.0001532	0.001	18	0%	0	0	0%	J
Strontium	A	mg/L	0.15	0.15		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.00024	0.00024		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000255	0.000255		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Uranium	A	mg/L	0.003152	0.003152		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699494	B18020773-002	200.7.8-W-DW	SAMP		2/14/2018 1:29:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	0.000983	0.000983		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.003121	0.003121		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J
Uranium, Activity	C	pCi/L	2.11184	2.11184		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699495	B18020783-001	200.7.8-W-DW	SAMP		2/14/2018 1:31:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000327	0.000327		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.008196	0.008196		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	A	mg/L	0.03322	0.03322		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	J
Cadmium	A	mg/L	-0.000052	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.001153	0.001153		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.0001	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.03067	0.03067		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000435	0.000435		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000721	0.000721		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000009	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.001203	0.001203		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.00033	0.00033		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000303	0.000303		0	0	0	0.0001532	0.001	18	0%	0	0	0%	J
Silver	A	mg/L	-0.000044	0		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	
Strontium	A	mg/L	0.2372	0.2372		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.000044	0		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	
Titanium	A	mg/L	0.000697	0.000697		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000179	0.000179		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000981	0.000981		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.02581	0.02581		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	
Uranium, Activity	C	pCi/L	0.11993	0.11993		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699496	B18020796-001	200.7.8-W-DW	SAMP		2/14/2018 1:34:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699496	B18020796-001	200.7.8-W-DW	SAMP		2/14/2018 1:34:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/L	0.000072	0.000072		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	J
Arsenic	B	mg/L	0.003847	0.003847		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	B	mg/L	0.08134	0.08134		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	B	mg/L	-0.000076	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	B	mg/L	0.0451	0.0451		0	0	0	0.00141	0.05	4.5	0%	0	0	0%	J
Cadmium	B	mg/L	-0.000055	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	B	mg/L	0.001472	0.001472		0	0	0	5.576E-05	0.05	18	0%	0	0	0%	J
Cobalt	B	mg/L	-0.000066	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	B	mg/L	0.01395	0.01395		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	B	mg/L	0.00009	0.00009		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Mercury	B	mg/L	-0.000005	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	B	mg/L	0.000952	0.000952		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	B	mg/L	0.00006	0		0	0	0	7.128E-05	0.05	4.5	0%	0	0	0%	
Selenium	B	mg/L	0.000057	0		0	0	0	0.0001532	0.001	18	0%	0	0	0%	
Silver	B	mg/L	-0.000073	0		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	
Strontium	B	mg/L	0.1101	0.1101		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	B	mg/L	0.000109	0.000109		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	J
Titanium	B	mg/L	0.000956	0.000956		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Vanadium	B	mg/L	0.001241	0.001241		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	B	mg/L	0.00865	0.00865		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699497	B18020883-001	200.7.8-W-DW	SAMP		2/14/2018 1:36:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000018	0		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000101	0.000101		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	J
Barium	A	mg/L	0.09775	0.09775		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000098	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.02027	0.02027		0	0	0	0.00141	0.05	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	-0.000068	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.000611	0.000611		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000026	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.01502	0.01502		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000413	0.000413		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699497	B18020883-001	200.7.8-W-DW	SAMP		2/14/2018 1:36:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Mercury	A	mg/L	-0.00001	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.01224	0.01224		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000603	0.000603		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Silver	A	mg/L	-0.000074	0		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	
Strontium	A	mg/L	0.2129	0.2129		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.000067	0.000067		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000841	0.000841		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Vanadium	A	mg/L	0.000708	0.000708		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.009571	0.009571		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J
Uranium	B	mg/L	0.7902	0.7902		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	*
Uranium, Activity	B	pCi/L	529.434	529.434		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699498	B18020883-002	200.7.8-W-DW	SAMP		2/14/2018 1:39:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000046	0		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000109	0.000109		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	J
Barium	A	mg/L	0.1017	0.1017		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000089	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.0178	0.0178		0	0	0	0.00141	0.05	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	-0.000068	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.000572	0.000572		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000059	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.01093	0.01093		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000443	0.000443		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Manganese	A	mg/L	-0.000058	0		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000013	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000122	0.000122		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000373	0.000373		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000457	0.000457		0	0	0	0.0001532	0.001	18	0%	0	0	0%	J
Silver	A	mg/L	-0.000082	0		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	
Strontium	A	mg/L	0.208	0.208		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.000024	0		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	
Titanium	A	mg/L	0.000641	0.000641		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699498	B18020883-002	200.7.8-W-DW	SAMP		2/14/2018 1:39:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	mg/L	0.001152	0.001152		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000251	0.000251		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.03767	0.03767		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	
Uranium, Activity	C	pCi/L	0.77184	0.77184		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699499	B18020883-003	200.7.8-W-DW	SAMP		2/14/2018 1:42:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.00006	0		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000035	0		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	A	mg/L	0.1031	0.1031		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000094	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.01632	0.01632		0	0	0	0.00141	0.05	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	-0.000064	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.000467	0.000467		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000052	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.01575	0.01575		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000441	0.000441		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000008	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.008889	0.008889		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000252	0.000252		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Silver	A	mg/L	-0.000079	0		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	
Strontium	A	mg/L	0.2098	0.2098		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	A	mg/L	-0.000013	0		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	
Titanium	A	mg/L	0.000673	0.000673		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Vanadium	A	mg/L	0.000424	0.000424		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.03058	0.03058		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	
Uranium	B	mg/L	0.3133	0.3133		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	*
Uranium, Activity	B	pCi/L	209.911	209.911		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699500	CCV	ICPMS-6020-W-	CCV		2/14/2018 1:44:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.05041	0.05041		0.05	0	0	0.0002849	0.1	4.5	101%	90	110	0%	
Antimony	A	mg/L	0.04803	0.04803		0.05	0	0	3.047E-05	0.05	18	96%	90	110	0%	
Arsenic	A	mg/L	0.04843	0.04843		0.05	0	0	6.629E-05	0.005	18	97%	90	110	0%	
Barium	A	mg/L	0.04765	0.04765		0.05	0	0	6.437E-05	0.1	18	95%	90	110	0%	
Beryllium	A	mg/L	0.05052	0.05052		0.05	0	0	8.97E-06	0.001	4.5	101%	90	110	0%	
Boron	A	mg/L	0.04872	0.04872		0.05	0	0	0.00141	0.1	4.5	97%	90	110	0%	
Cadmium	A	mg/L	0.04857	0.04857		0.05	0	0	1.468E-05	0.001	18	97%	90	110	0%	
Cerium	A	mg/L	0.04818	0.04818		0.05	0	0	2.257E-05	0.001	4.5	96%	90	110	0%	
Chromium	A	mg/L	0.04963	0.04963		0.05	0	0	5.576E-05	0.01	18	99%	90	110	0%	
Cobalt	A	mg/L	0.04997	0.04997		0.05	0	0	3.904E-05	0.01	18	100%	90	110	0%	
Copper	A	mg/L	0.04933	0.04933		0.05	0	0	7.681E-05	0.01	4.5	99%	90	110	0%	
Iron	A	mg/L	1.294	1.294		1.3	0	0	0.000175	0.02	4.5	100%	90	110	0%	
Lanthanum	A	mg/L	0.04807	0.04807		0.05	0	0	0.0000111	0.001	4.5	96%	90	110	0%	
Lead	A	mg/L	0.04926	0.04926		0.05	0	0	2.956E-05	0.01	18	99%	90	110	0%	
Manganese	A	mg/L	0.04988	0.04988		0.05	0	0	3.649E-05	0.01	18	100%	90	110	0%	
Mercury	A	mg/L	0.001019	0.001019		0.001	0	0	1.289E-05	0.001	0.36	102%	90	110	0%	
Molybdenum	A	mg/L	0.0489	0.0489		0.05	0	0	2.302E-05	0.005	9	98%	90	110	0%	
Nickel	A	mg/L	0.0496	0.0496		0.05	0	0	7.128E-05	0.01	4.5	99%	90	110	0%	
Selenium	A	mg/L	0.0493	0.0493		0.05	0	0	0.0001532	0.005	18	99%	90	110	0%	
Silver	A	mg/L	0.01867	0.01867		0.02	0	0	2.959E-05	0.005	1.8	93%	90	110	0%	
Strontium	A	mg/L	0.04862	0.04862		0.05	0	0	1.229E-05	0.1	18	97%	90	110	0%	
Thallium	A	mg/L	0.05078	0.05078		0.05	0	0	1.434E-05	0.1	18	102%	90	110	0%	
Thorium	A	mg/L	0.04428	0.04428		0.05	0	0	5.767E-05	0.001	4.5	89%	90	110	0%	S
Thorium 232	A	mg/L	0.04428	0.04428		0.05	0	0	5.767E-05	0.01	4.5	89%	90	110	0%	S
Tin	A	mg/L	0.04841	0.04841		0.05	0	0	5.199E-05	0.1	9	97%	90	110	0%	
Titanium	A	mg/L	0.05125	0.05125		0.05	0	0	0.0001736	0.01	18	102%	90	110	0%	
Uranium	A	mg/L	0.04911	0.04911		0.05	0	0	1.332E-05	0.001	4.5	98%	90	110	0%	
Vanadium	A	mg/L	0.04954	0.04954		0.05	0	0	7.351E-05	0.1	18	99%	90	110	0%	
Zinc	A	mg/L	0.05081	0.05081		0.05	0	0	0.0002495	0.01	4.5	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699501	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:47:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699501	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 1:47:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000138	0.000138		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	-0.000018	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000016	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000056	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002544	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000055	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000036	0.000036		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000051	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000028	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000093	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.006305	0.006305		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000035	0.000035		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	-0.000002	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000127	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000003	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.00038	0.00038		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	-0.000161	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000128	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000058	0.000058		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000131	0.000131		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000688	0.000688		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000677	0.000677		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	-0.000001	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000219	0.000219		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	-0.000029	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000297	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699502	CCB	ICPMS-6020-W-	CCB		2/14/2018 1:50:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.001125	-0.001125		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000026	0.000026		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000081	-0.000081		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000013	-0.000013		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699502	CCB	ICPMS-6020-W-	CCB		2/14/2018 1:50:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/L	-0.00008	-0.00008		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002935	-0.002935		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000067	-0.000067		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.00002	0.00002		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000007	0.000007		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000062	-0.000062		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000065	-0.000065		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.005283	0.005283		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000022	0.000022		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000018	-0.000018		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000148	-0.000148		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000005	-0.000005		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000034	0.000034		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.00009	-0.00009		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000162	-0.000162		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000034	-0.000034		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000061	0.000061		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.000476	0.000476		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000124	0.000124		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000124	0.000124		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000241	0.000241		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000043	-0.000043		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000095	0.000095		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000068	-0.000068		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000216	-0.000216		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699503	B18020883-004	200.7.8-W-DW	SAMP		2/14/2018 1:52:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000029	0		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000196	0.000196		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	J
Barium	A	mg/L	0.09992	0.09992		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000105	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.01807	0.01807		0	0	0	0.00141	0.05	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699503	B18020883-004	200.7.8-W-DW	SAMP		2/14/2018 1:52:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium	A	mg/L	-0.000067	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.000704	0.000704		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000041	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.02821	0.02821		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000748	0.000748		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000054	0.000054		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000001	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000005	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000458	0.000458		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000396	0.000396		0	0	0	0.0001532	0.001	18	0%	0	0	0%	J
Silver	A	mg/L	-0.000051	0		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	
Strontium	A	mg/L	0.2192	0.2192		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	A	mg/L	0.000044	0		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	
Titanium	A	mg/L	0.000745	0.000745		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000048	0.000048		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000223	0.000223		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.03218	0.03218		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	
Uranium, Activity	C	pCi/L	0.03216	0.03216		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699504	B18020932-001	200.7.8-W-AS	SAMP		2/14/2018 1:55:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000189	0.000189		0	0	0	0.0000306	0.001	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000592	0.000592		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	J
Cadmium	A	mg/L	-0.000124	0		0	0	0	5.635E-05	0.001	18	0%	0	0	0%	
Iron	A	mg/L	0.3138	0.3138		0	0	0	0.000175	0.03	4.5	0%	0	0	0%	
Lead	A	mg/L	0.00047	0.00047		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000853	0.000853		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	J
Mercury	A	mg/L	0.00001	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.003303	0.003303		0	0	0	2.302E-05	0.001	9	0%	0	0	0%	
Selenium	A	mg/L	0.000334	0.000334		0	0	0	0.0001532	0.001	18	0%	0	0	0%	J
Silver	A	mg/L	-0.000074	0		0	0	0	2.959E-05	0.001	1.8	0%	0	0	0%	
Uranium	A	mg/L	0.000992	0.000992		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	
Barium	B	mg/L	0.09915	0.09915		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699504	B18020932-001	200.7.8-W-AS	SAMP		2/14/2018 1:55:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	B	mg/L	0.004616	0.004616		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	B	mg/L	-0.000037	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	B	mg/L	0.01393	0.01393		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Nickel	B	mg/L	0.000377	0.000377		0	0	0	7.128E-05	0.005	4.5	0%	0	0	0%	J
Strontium	B	mg/L	0.2795	0.2795		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	B	mg/L	-0.000092	0		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	
Titanium	B	mg/L	0.001325	0.001325		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Vanadium	B	mg/L	0.002209	0.002209		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	B	mg/L	0.004078	0.004078		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699505	B18020941-001	200.7.8-W-AS	SAMP		2/14/2018 1:58:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000179	0.000179		0	0	0	0.0000306	0.001	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.001375	0.001375		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	A	mg/L	0.07212	0.07212		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	
Cadmium	A	mg/L	-0.000051	0		0	0	0	5.635E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.004178	0.004178		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000049	0.000049		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	J
Copper	A	mg/L	0.2018	0.2018		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Iron	A	mg/L	0.237	0.237		0	0	0	0.000175	0.03	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000483	0.000483		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000305	0.000305		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000008	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.002053	0.002053		0	0	0	2.302E-05	0.001	9	0%	0	0	0%	
Nickel	A	mg/L	0.000945	0.000945		0	0	0	7.128E-05	0.005	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.002024	0.002024		0	0	0	0.0001532	0.001	18	0%	0	0	0%	
Silver	A	mg/L	-0.000077	0		0	0	0	2.959E-05	0.001	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.3875	0.3875		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Tin	A	mg/L	-0.000129	0		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	
Titanium	A	mg/L	0.00112	0.00112		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Uranium	A	mg/L	0.001521	0.001521		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.001237	0.001237		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.01434	0.01434		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699505	B18020941-001	200.7.8-W-AS	SAMP		2/14/2018 1:58:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699506	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:00:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.00008	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000084	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.00005	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000116	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002945	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000091	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000003	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000078	0.000078		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000082	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000857	0.000857		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.005262	0.005262		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000003	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000039	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.00016	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000002	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000054	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000155	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000167	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000046	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000342	0.000342		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000473	0.000473		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000175	0.000175		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	-0.000086	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000049	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000034	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000189	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699507	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:03:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000097	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000043	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.000023	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000121	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.003267	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.00009	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000002	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000014	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000062	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000273	0.000273		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.007944	0.007944		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000003	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000057	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000174	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.00001	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000111	0		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000166	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000058	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000056	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.00016	0.00016		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000321	0.000321		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000024	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000082	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000078	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000055	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000283	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699508	MB-118409	6010.20-SPLP	MBLK		2/14/2018 2:06:0	1	118409	2/12/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.06989	0.06989		0	0	0	0.002004	0.03	5	0%	0	0	0%	
Antimony	A	mg/L	0.000434	0.000434		0	0	0	2.034E-05	0.001	5	0%	0	0	0%	
Arsenic	A	mg/L	0.000441	0.000441		0	0	0	0.0002765	0.001	5	0%	0	0	0%	
Barium	A	mg/L	0.0104	0.0104		0	0	0	0.0000743	0.05	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699508	MB-118409	6010.20-SPLP	MBLK		2/14/2018 2:06:0	1	118409	2/12/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Beryllium	A	mg/L	-0.000112	0		0	0	0	0.0000149	0.001	5	0%	0	0	0%	
Boron	A	mg/L	0.08653	0.08653		0	0	0	0.00105	0.05	5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000199	0		0	0	0	5.453E-05	0.001	5	0%	0	0	0%	
Chromium	A	mg/L	0.003007	0.003007		0	0	0	0.0002192	0.005	5	0%	0	0	0%	
Cobalt	A	mg/L	-0.000015	0		0	0	0	8.706E-05	0.005	5	0%	0	0	0%	
Copper	A	mg/L	0.000687	0.000687		0	0	0	0.0001527	0.005	5	0%	0	0	0%	
Lead	A	mg/L	0.000669	0.000669		0	0	0	2.616E-05	0.001	5	0%	0	0	0%	
Manganese	A	mg/L	0.000219	0.000219		0	0	0	8.486E-05	0.001	5	0%	0	0	0%	
Molybdenum	A	mg/L	0.000851	0.000851		0	0	0	4.274E-05	0.001	5	0%	0	0	0%	
Nickel	A	mg/L	0.000773	0.000773		0	0	0	4.727E-05	0.005	5	0%	0	0	0%	
Selenium	A	mg/L	-0.000043	0		0	0	0	0.0002549	0.001	5	0%	0	0	0%	
Silver	A	mg/L	0.00088	0.00088		0	0	0	7.125E-05	0.001	0.25	0%	0	0	0%	
Strontium	A	mg/L	0.001785	0.001785		0	0	0	1.468E-05	0.01	5	0%	0	0	0%	
Thallium	A	mg/L	0.003747	0.003747		0	0	0	2.645E-05	0.0005	5	0%	0	0	0%	
Tin	A	mg/L	0.003776	0.003776		0	0	0	0.0002018	0.05	5	0%	0	0	0%	
Titanium	A	mg/L	0.001426	0.001426		0	0	0	0.0002352	0.005	5	0%	0	0	0%	
Uranium	A	mg/L	-0.000022	0		0	0	0	1.822E-05	0.0003	5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000095	0		0	0	0	0.0007003	0.01	5	0%	0	0	0%	
Zinc	A	mg/L	0.003898	0.003898		0	0	0	0.0004146	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699509	B18020067-001	6010.20-SPLP	SAMP		2/14/2018 2:08:0	1	118409	2/12/2018 8:	0	0	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000557	0.001114		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Barium	A	mg/L	0.1264	0.2528		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Molybdenum	A	mg/L	0.000991	0.001982		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Selenium	A	mg/L	0.000112	0		0	0	0	0.0005098	0.001	5	0%	0	0	0%	
Uranium	A	mg/L	0.000915	0.00183		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	A	mg/L	0.03363	0.06726		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Arsenic	B	mg/L	0.004238	0.008476		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000005	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.01623	0.03246		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.003311	0.006622		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.0051	0.0102		0	0	0	0.0003054	0.005	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699509	B18020067-001	6010.20-SPLP	SAMP		2/14/2018 2:08:0	1	118409	2/12/2018 8:	0	0	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	B	mg/L	0.008873	0.017746		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.1075	0.215		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.009129	0.018258		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	0.000195	0.00039		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	J
Strontium	B	mg/L	0.03693	0.07386		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.003436	0.006872		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.2015	0.403		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Zinc	B	mg/L	0.03584	0.07168		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699510	B18020067-001	6010.20-SPLP	SD		2/14/2018 2:11:0	5	118409	2/12/2018 8:	0	1E+07	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	3.73	37.3		0	0	36.34	0.02004	0.03	5	0%			3%	
Antimony	A	mg/L	-0.000032	0		0	0	0.001114	0.0002034	0.001	5	0%				
Arsenic	A	mg/L	0.000876	0.00876		0	0	0.008476	0.002765	0.002765	5	0%				N
Barium	A	mg/L	0.02433	0.2433		0	0	0.2528	0.000743	0.05	5	0%			4%	
Beryllium	A	mg/L	0.000098	0.00098		0	0	0.00146	0.000149	0.001	5	0%				N
Boron	A	mg/L	0.05389	0.5389		0	0	0.5424	0.0105	0.05	5	0%			1%	
Cadmium	A	mg/L	-0.000084	0		0	0	0	0.0005453	0.001	5	0%				
Chromium	A	mg/L	0.003193	0.03193		0	0	0.03246	0.002192	0.005	5	0%			2%	
Cobalt	A	mg/L	0.000535	0.00535		0	0	0.006622	0.0008706	0.005	5	0%				N
Copper	A	mg/L	0.001103	0.01103		0	0	0.0102	0.001527	0.005	5	0%				N
Lead	A	mg/L	0.002051	0.02051		0	0	0.017746	0.0002616	0.001	5	0%			14%	R
Manganese	A	mg/L	0.02083	0.2083		0	0	0.215	0.0008486	0.001	5	0%			3%	
Molybdenum	A	mg/L	0.000017	0		0	0	0.001982	0.0004274	0.001	5	0%				
Nickel	A	mg/L	0.001732	0.01732		0	0	0.018258	0.0004727	0.005	5	0%			5%	
Selenium	A	mg/L	0.000029	0		0	0	0	0.002549	0.002549	5	0%				
Silver	A	mg/L	-0.000079	0		0	0	0.00039	0.0007125	0.001	0.25	0%				
Strontium	A	mg/L	0.007124	0.07124		0	0	0.07386	0.0001468	0.01	5	0%			4%	
Thallium	A	mg/L	0.000384	0.00384		0	0	0.001788	0.0002645	0.0005	5	0%				N
Tin	A	mg/L	0.000307	0.00307		0	0	0.006872	0.002018	0.05	5	0%				N
Titanium	A	mg/L	0.04259	0.4259		0	0	0.403	0.002352	0.005	5	0%			6%	
Uranium	A	mg/L	0.000091	0.00091		0	0	0.00183	0.0001822	0.0003	5	0%				N
Vanadium	A	mg/L	0.006067	0.06067		0	0	0.06726	0.007003	0.01	5	0%				N

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699510	B18020067-001	6010.20-SPLP	SD		2/14/2018 2:11:0	5	118409	2/12/2018 8:	0	1E+07	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/L	0.00784	0.0784		0	0	0.07168	0.004146	0.01	5	0%			9%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699511	B18020067-002	6010.20-SPLP	SAMP		2/14/2018 2:14:0	1	118409	2/12/2018 8:	0	0	9.64

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000703	0.001406		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Barium	A	mg/L	0.1109	0.2218		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Molybdenum	A	mg/L	0.001874	0.003748		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Selenium	A	mg/L	0.000041	0		0	0	0	0.0005098	0.001	5	0%	0	0	0%	
Uranium	A	mg/L	0.002926	0.005852		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	A	mg/L	0.03139	0.06278		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Arsenic	B	mg/L	0.004091	0.008182		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Beryllium	B	mg/L	0.000586	0.001172		0	0	0	0.0000298	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	0.00001	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.01199	0.02398		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.005074	0.010148		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.005552	0.011104		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.01275	0.0255		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.144	0.288		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.006584	0.013168		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	0.000109	0.000218		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	J
Strontium	B	mg/L	0.05421	0.10842		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.002654	0.005308		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.1648	0.3296		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Zinc	B	mg/L	0.03058	0.06116		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699512	LCS-118409	6010.20-SPLP	LCS		2/14/2018 2:16:0	1	118409	2/12/2018 8:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.666	2.666		2.5	0.06989	0	0.002004	0.03	5	104%	80	120	0%	
Antimony	A	mg/L	0.4994	0.4994		0.5	0.000434	0	2.034E-05	0.001	5	100%	80	120	0%	
Arsenic	A	mg/L	0.4812	0.4812		0.5	0.000441	0	0.0002765	0.001	5	96%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699512	LCS-118409	6010.20-SPLP	LCS		2/14/2018 2:16:0	1	118409	2/12/2018 8:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	5.322	5.322		5.5	0.0104	0	0.0000743	0.05	5	97%	80	120	0%	
Beryllium	A	mg/L	0.2361	0.2361		0.25	0	0	0.0000149	0.001	5	94%	80	120	0%	
Boron	A	mg/L	0.5845	0.5845		0.5	0.08653	0	0.00105	0.05	5	100%	80	120	0%	
Cadmium	A	mg/L	0.2349	0.2349		0.25	0	0	5.453E-05	0.001	5	94%	80	120	0%	
Chromium	A	mg/L	0.5313	0.5313		0.5	0.003007	0	0.0002192	0.005	5	106%	80	120	0%	
Cobalt	A	mg/L	0.5253	0.5253		0.5	0	0	8.706E-05	0.005	5	105%	80	120	0%	
Copper	A	mg/L	0.5094	0.5094		0.5	0.000687	0	0.0001527	0.005	5	102%	80	120	0%	
Lead	A	mg/L	0.5075	0.5075		0.5	0.000669	0	2.616E-05	0.001	5	101%	80	120	0%	
Manganese	A	mg/L	2.571	2.571		2.5	0.000219	0	8.486E-05	0.001	5	103%	80	120	0%	
Molybdenum	A	mg/L	0.5535	0.5535		0.5	0.000851	0	4.274E-05	0.001	5	111%	80	120	0%	
Nickel	A	mg/L	0.5211	0.5211		0.5	0.000773	0	4.727E-05	0.005	5	104%	80	120	0%	
Selenium	A	mg/L	0.4016	0.4016		0.5	0	0	0.0002549	0.001	5	80%	80	120	0%	
Silver	A	mg/L	0.2602	0.2602		0.25	0.00088	0	7.125E-05	0.001	0.25	104%	80	120	0%	
Strontium	A	mg/L	0.5233	0.5233		0.5	0.001785	0	1.468E-05	0.01	5	104%	80	120	0%	
Thallium	A	mg/L	0.4973	0.4973		0.5	0.003747	0	2.645E-05	0.0005	5	99%	80	120	0%	
Tin	A	mg/L	0.5662	0.5662		0.5	0.003776	0	0.0002018	0.05	5	112%	80	120	0%	
Titanium	A	mg/L	0.5526	0.5526		0.5	0.001426	0	0.0002352	0.005	5	110%	80	120	0%	
Uranium	A	mg/L	0.5395	0.5395		0.5	0	0	1.822E-05	0.0003	5	108%	80	120	0%	
Vanadium	A	mg/L	0.5513	0.5513		0.5	0	0	0.0007003	0.01	5	110%	80	120	0%	
Zinc	A	mg/L	0.4514	0.4514		0.5	0.003898	0	0.0004146	0.01	5	90%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699513	CCV	ICPMS-6020-W-	CCV		2/14/2018 2:19:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.06618	0.06618		0.05	0	0	0.0002849	0.1	4.5	132%	90	110	0%	S
Antimony	A	mg/L	0.04942	0.04942		0.05	0	0	3.047E-05	0.05	18	99%	90	110	0%	
Arsenic	A	mg/L	0.05083	0.05083		0.05	0	0	6.629E-05	0.005	18	102%	90	110	0%	
Barium	A	mg/L	0.05275	0.05275		0.05	0	0	6.437E-05	0.1	18	105%	90	110	0%	
Beryllium	A	mg/L	0.04987	0.04987		0.05	0	0	8.97E-06	0.001	4.5	100%	90	110	0%	
Boron	A	mg/L	0.05261	0.05261		0.05	0	0	0.00141	0.1	4.5	105%	90	110	0%	
Cadmium	A	mg/L	0.04977	0.04977		0.05	0	0	1.468E-05	0.001	18	100%	90	110	0%	
Cerium	A	mg/L	0.04952	0.04952		0.05	0	0	2.257E-05	0.001	4.5	99%	90	110	0%	
Chromium	A	mg/L	0.05283	0.05283		0.05	0	0	5.576E-05	0.01	18	106%	90	110	0%	
Cobalt	A	mg/L	0.05226	0.05226		0.05	0	0	3.904E-05	0.01	18	105%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699513	CCV	ICPMS-6020-W-	CCV		2/14/2018 2:19:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	A	mg/L	0.05204	0.05204		0.05	0	0	7.681E-05	0.01	4.5	104%	90	110	0%	
Iron	A	mg/L	1.38	1.38		1.3	0	0	0.000175	0.02	4.5	106%	90	110	0%	
Lanthanum	A	mg/L	0.04964	0.04964		0.05	0	0	0.0000111	0.001	4.5	99%	90	110	0%	
Lead	A	mg/L	0.05117	0.05117		0.05	0	0	2.956E-05	0.01	18	102%	90	110	0%	
Manganese	A	mg/L	0.05475	0.05475		0.05	0	0	3.649E-05	0.01	18	109%	90	110	0%	
Mercury	A	mg/L	0.001054	0.001054		0.001	0	0	1.289E-05	0.001	0.36	105%	90	110	0%	
Molybdenum	A	mg/L	0.05126	0.05126		0.05	0	0	2.302E-05	0.005	9	103%	90	110	0%	
Nickel	A	mg/L	0.05199	0.05199		0.05	0	0	7.128E-05	0.01	4.5	104%	90	110	0%	
Selenium	A	mg/L	0.05115	0.05115		0.05	0	0	0.0001532	0.005	18	102%	90	110	0%	
Silver	A	mg/L	0.01942	0.01942		0.02	0	0	2.959E-05	0.005	1.8	97%	90	110	0%	
Strontium	A	mg/L	0.05084	0.05084		0.05	0	0	1.229E-05	0.1	18	102%	90	110	0%	
Thallium	A	mg/L	0.05172	0.05172		0.05	0	0	1.434E-05	0.1	18	103%	90	110	0%	
Thorium	A	mg/L	0.04503	0.04503		0.05	0	0	5.767E-05	0.001	4.5	90%	90	110	0%	
Thorium 232	A	mg/L	0.04503	0.04503		0.05	0	0	5.767E-05	0.01	4.5	90%	90	110	0%	
Tin	A	mg/L	0.04914	0.04914		0.05	0	0	5.199E-05	0.1	9	98%	90	110	0%	
Titanium	A	mg/L	0.05442	0.05442		0.05	0	0	0.0001736	0.01	18	109%	90	110	0%	
Uranium	A	mg/L	0.04963	0.04963		0.05	0	0	1.332E-05	0.001	4.5	99%	90	110	0%	
Vanadium	A	mg/L	0.05257	0.05257		0.05	0	0	7.351E-05	0.1	18	105%	90	110	0%	
Zinc	A	mg/L	0.05195	0.05195		0.05	0	0	0.0002495	0.01	4.5	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699514	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:21:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000325	0.000325		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000253	0.000253		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.002178	0.002178		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000027	0.000027		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	0.000614	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000016	0.000016		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000267	0.000267		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000339	0.000339		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000191	0.000191		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000164	0.000164		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.01788	0.01788		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699514	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:21:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lanthanum	A	mg/L	0.000274	0.000274		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000594	0.000594		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.001153	0.001153		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000559	0.000559		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.00016	0.00016		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000221	0.000221		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.00018	0.00018		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000189	0.000189		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.001299	0.001299		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000988	0.000988		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000299	0.000299		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000164	0.000164		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000185	0.000185		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	-0.000068	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699515	CCB	ICPMS-6020-W-	CCB		2/14/2018 2:24:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.003857	0.003857		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000119	0.000119		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000019	0.000019		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.001238	0.001238		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.00005	-0.00005		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002108	-0.002108		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000017	-0.000017		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000158	0.000158		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000142	0.000142		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	0.000105	0.000105		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000051	0.000051		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.0123	0.0123		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.00014	0.00014		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000325	0.000325		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000624	0.000624		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699515	CCB	ICPMS-6020-W-	CCB		2/14/2018 2:24:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Mercury	A	mg/L	-0.000013	-0.000013		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000181	0.000181		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000068	0.000068		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.00003	-0.00003		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000023	0.000023		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000073	0.000073		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.001415	0.001415		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000285	0.000285		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000285	0.000285		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000347	0.000347		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000015	-0.000015		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000034	0.000034		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000079	0.000079		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000003	0.000003		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699516	LCSD-118409	6010.20-SPLP	LCSD		2/14/2018 2:26:0	1	118409	2/12/2018 8:	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.609	2.609		2.5	0.06989	2.666	0.002004	0.03	5	102%	80	120	2%	
Antimony	A	mg/L	0.5055	0.5055		0.5	0.000434	0.4994	2.034E-05	0.001	5	101%	80	120	1%	
Arsenic	A	mg/L	0.4892	0.4892		0.5	0.000441	0.4812	0.0002765	0.001	5	98%	80	120	2%	
Barium	A	mg/L	5.49	5.49		5.5	0.0104	5.322	0.0000743	0.05	5	100%	80	120	3%	
Beryllium	A	mg/L	0.2447	0.2447		0.25	0	0.2361	0.0000149	0.001	5	98%	80	120	4%	
Boron	A	mg/L	0.6028	0.6028		0.5	0.08653	0.5845	0.00105	0.05	5	103%	80	120	3%	
Cadmium	A	mg/L	0.2418	0.2418		0.25	0	0.2349	5.453E-05	0.001	5	97%	80	120	3%	
Chromium	A	mg/L	0.542	0.542		0.5	0.003007	0.5313	0.0002192	0.005	5	108%	80	120	2%	
Cobalt	A	mg/L	0.5399	0.5399		0.5	0	0.5253	8.706E-05	0.005	5	108%	80	120	3%	
Copper	A	mg/L	0.5138	0.5138		0.5	0.000687	0.5094	0.0001527	0.005	5	103%	80	120	1%	
Lead	A	mg/L	0.5218	0.5218		0.5	0.000669	0.5075	2.616E-05	0.001	5	104%	80	120	3%	
Manganese	A	mg/L	2.648	2.648		2.5	0.000219	2.571	8.486E-05	0.001	5	106%	80	120	3%	
Molybdenum	A	mg/L	0.5668	0.5668		0.5	0.000851	0.5535	4.274E-05	0.001	5	113%	80	120	2%	
Nickel	A	mg/L	0.5285	0.5285		0.5	0.000773	0.5211	4.727E-05	0.005	5	106%	80	120	1%	
Selenium	A	mg/L	0.4042	0.4042		0.5	0	0.4016	0.0002549	0.001	5	81%	80	120	1%	
Silver	A	mg/L	0.2659	0.2659		0.25	0.00088	0.2602	7.125E-05	0.001	0.25	106%	80	120	2%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699516	LCSD-118409	6010.20-SPLP	LCSD		2/14/2018 2:26:0	1	118409	2/12/2018 8:	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium	A	mg/L	0.5323	0.5323		0.5	0.001785	0.5233	1.468E-05	0.01	5	106%	80	120	2%	
Thallium	A	mg/L	0.5206	0.5206		0.5	0.003747	0.4973	2.645E-05	0.0005	5	103%	80	120	5%	
Tin	A	mg/L	0.5739	0.5739		0.5	0.003776	0.5662	0.0002018	0.05	5	114%	80	120	1%	
Titanium	A	mg/L	0.5694	0.5694		0.5	0.001426	0.5526	0.0002352	0.005	5	114%	80	120	3%	
Uranium	A	mg/L	0.5428	0.5428		0.5	0	0.5395	1.822E-05	0.0003	5	109%	80	120	1%	
Vanadium	A	mg/L	0.5601	0.5601		0.5	0	0.5513	0.0007003	0.01	5	112%	80	120	2%	
Zinc	A	mg/L	0.4642	0.4642		0.5	0.003898	0.4514	0.0004146	0.01	5	92%	80	120	3%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699517	B18020067-001	6010.20-SPLP	MS3		2/14/2018 2:29:0	1	118409	2/12/2018 8:	1E+07	0	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	26.58	53.16		5	36.34	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.4976	0.9952		1	0.001114	0	4.068E-05	0.001	5	99%	75	125	0%	
Arsenic	A	mg/L	0.4828	0.9656		1	0.008476	0	0.000553	0.001	5	96%	75	125	0%	
Barium	A	mg/L	5.611	11.222		11	0.2528	0	0.0001486	0.05	5	100%	75	125	0%	
Beryllium	A	mg/L	0.2232	0.4464		0.5	0.00146	0	0.0000298	0.001	5	89%	75	125	0%	
Boron	A	mg/L	0.754	1.508		1	0.5424	0	0.0021	0.05	5	97%	75	125	0%	
Cadmium	A	mg/L	0.238	0.476		0.5	0	0	0.0001091	0.001	5	95%	75	125	0%	
Chromium	A	mg/L	0.5513	1.1026		1	0.03246	0	0.0004384	0.005	5	107%	75	125	0%	
Cobalt	A	mg/L	0.5293	1.0586		1	0.006622	0	0.0001741	0.005	5	105%	75	125	0%	
Copper	A	mg/L	0.5153	1.0306		1	0.0102	0	0.0003054	0.005	5	102%	75	125	0%	
Lead	A	mg/L	0.5239	1.0478		1	0.017746	0	5.232E-05	0.001	5	103%	75	125	0%	
Manganese	A	mg/L	2.709	5.418		5	0.215	0	0.0001697	0.001	5	104%	75	125	0%	
Molybdenum	A	mg/L	0.549	1.098		1	0.001982	0	8.548E-05	0.001	5	110%	75	125	0%	
Nickel	A	mg/L	0.5191	1.0382		1	0.018258	0	9.454E-05	0.005	5	102%	75	125	0%	
Selenium	A	mg/L	0.4002	0.8004		1	0	0	0.0005098	0.001	5	80%	75	125	0%	
Silver	A	mg/L	0.2642	0.5284		0.5	0.00039	0	0.0001425	0.001	0.25	106%	75	125	0%	
Strontium	A	mg/L	0.5713	1.1426		1	0.07386	0	2.936E-05	0.01	5	107%	75	125	0%	
Thallium	A	mg/L	0.507	1.014		1	0.001788	0	0.0000529	0.0005	5	101%	75	125	0%	
Tin	A	mg/L	0.5701	1.1402		1	0.006872	0	0.0004036	0.05	5	113%	75	125	0%	
Titanium	A	mg/L	0.7848	1.5696		1	0.403	0	0.0004704	0.005	5	117%	75	125	0%	
Uranium	A	mg/L	0.5399	1.0798		1	0.00183	0	3.644E-05	0.0003	5	108%	75	125	0%	
Vanadium	A	mg/L	0.583	1.166		1	0.06726	0	0.0014006	0.01	5	110%	75	125	0%	
Zinc	A	mg/L	0.4898	0.9796		1	0.07168	0	0.0008292	0.01	5	91%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699517	B18020067-001	6010.20-SPLP	MS3		2/14/2018 2:29:0	1	118409	2/12/2018 8:	1E+07	0	2.66

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699518	B18020067-002	6010.20-SPLP	MS3		2/14/2018 2:31:0	1	118409	2/12/2018 8:	1E+07	0	9.64

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	17.79	35.58		5	24.16	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.5176	1.0352		1	0.001406	0	4.068E-05	0.001	5	103%	75	125	0%	
Arsenic	A	mg/L	0.4853	0.9706		1	0.008182	0	0.000553	0.001	5	96%	75	125	0%	
Barium	A	mg/L	5.76	11.52		11	0.2218	0	0.0001486	0.05	5	103%	75	125	0%	
Beryllium	A	mg/L	0.2307	0.4614		0.5	0.001172	0	0.0000298	0.001	5	92%	75	125	0%	
Boron	A	mg/L	0.6631	1.3262		1	0.3242	0	0.0021	0.05	5	100%	75	125	0%	
Cadmium	A	mg/L	0.2446	0.4892		0.5	0	0	0.0001091	0.001	5	98%	75	125	0%	
Chromium	A	mg/L	0.5411	1.0822		1	0.02398	0	0.0004384	0.005	5	106%	75	125	0%	
Cobalt	A	mg/L	0.5455	1.091		1	0.010148	0	0.0001741	0.005	5	108%	75	125	0%	
Copper	A	mg/L	0.5271	1.0542		1	0.011104	0	0.0003054	0.005	5	104%	75	125	0%	
Lead	A	mg/L	0.5479	1.0958		1	0.0255	0	5.232E-05	0.001	5	107%	75	125	0%	
Manganese	A	mg/L	2.845	5.69		5	0.288	0	0.0001697	0.001	5	108%	75	125	0%	
Molybdenum	A	mg/L	0.5563	1.1126		1	0.003748	0	8.548E-05	0.001	5	111%	75	125	0%	
Nickel	A	mg/L	0.5312	1.0624		1	0.013168	0	9.454E-05	0.005	5	105%	75	125	0%	
Selenium	A	mg/L	0.4046	0.8092		1	0	0	0.0005098	0.001	5	81%	75	125	0%	
Silver	A	mg/L	0.2579	0.5158		0.5	0.000218	0	0.0001425	0.001	0.25	103%	75	125	0%	
Strontium	A	mg/L	0.5728	1.1456		1	0.10842	0	2.936E-05	0.01	5	104%	75	125	0%	
Thallium	A	mg/L	0.5254	1.0508		1	0.000698	0	0.0000529	0.0005	5	105%	75	125	0%	
Tin	A	mg/L	0.573	1.146		1	0.005308	0	0.0004036	0.05	5	114%	75	125	0%	
Titanium	A	mg/L	0.7295	1.459		1	0.3296	0	0.0004704	0.005	5	113%	75	125	0%	
Uranium	A	mg/L	0.5534	1.1068		1	0.005852	0	3.644E-05	0.0003	5	110%	75	125	0%	
Vanadium	A	mg/L	0.5795	1.159		1	0.06278	0	0.0014006	0.01	5	110%	75	125	0%	
Zinc	A	mg/L	0.4954	0.9908		1	0.06116	0	0.0008292	0.01	5	93%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699519	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:34:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699519	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:34:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.001088	0.001088		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.001083	0.001083		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.0106	0.0106		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000382	0.000382		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	0.006797	0.006797		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000399	0.000399		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Chromium	A	mg/L	0.000995	0.000995		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000981	0.000981		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000919	0.000919		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.001625	0.001625		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.005215	0.005215		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000012	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.001337	0.001337		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000897	0.000897		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.00096	0.00096		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.00049	0.00049		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000969	0.000969		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.001348	0.001348		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.001121	0.001121		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.001448	0.001448		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000886	0.000886		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.00093	0.00093		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000682	0.000682		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699520	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:36:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.00045	0.00045		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000563	0.000563		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.005764	0.005764		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000142	0.000142		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	0.003285	0.003285		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000177	0.000177		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000524	0.000524		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699520	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:36:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.000577	0.000577		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000496	0.000496		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000446	0.000446		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000525	0.000525		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000815	0.000815		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.002743	0.002743		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000018	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000491	0.000491		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.00043	0.00043		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000438	0.000438		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000177	0.000177		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000464	0.000464		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.001295	0.001295		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000465	0.000465		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000732	0.000732		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000375	0.000375		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000455	0.000455		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000246	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699521	CCV	ICPMS-6020-W-	CCV		2/14/2018 2:39:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.0593	0.0593		0.05	0	0	0.0002849	0.1	4.5	119%	90	110	0%	S
Antimony	A	mg/L	0.04978	0.04978		0.05	0	0	3.047E-05	0.05	18	100%	90	110	0%	
Arsenic	A	mg/L	0.05059	0.05059		0.05	0	0	6.629E-05	0.005	18	101%	90	110	0%	
Barium	A	mg/L	0.0529	0.0529		0.05	0	0	6.437E-05	0.1	18	106%	90	110	0%	
Beryllium	A	mg/L	0.05139	0.05139		0.05	0	0	8.97E-06	0.001	4.5	103%	90	110	0%	
Boron	A	mg/L	0.04899	0.04899		0.05	0	0	0.00141	0.1	4.5	98%	90	110	0%	
Cadmium	A	mg/L	0.05065	0.05065		0.05	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.05041	0.05041		0.05	0	0	2.257E-05	0.001	4.5	101%	90	110	0%	
Chromium	A	mg/L	0.05239	0.05239		0.05	0	0	5.576E-05	0.01	18	105%	90	110	0%	
Cobalt	A	mg/L	0.05148	0.05148		0.05	0	0	3.904E-05	0.01	18	103%	90	110	0%	
Copper	A	mg/L	0.05154	0.05154		0.05	0	0	7.681E-05	0.01	4.5	103%	90	110	0%	
Iron	A	mg/L	1.352	1.352		1.3	0	0	0.000175	0.02	4.5	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699521	CCV	ICPMS-6020-W-	CCV		2/14/2018 2:39:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lanthanum	A	mg/L	0.05023	0.05023		0.05	0	0	0.0000111	0.001	4.5	100%	90	110	0%	
Lead	A	mg/L	0.05046	0.05046		0.05	0	0	2.956E-05	0.01	18	101%	90	110	0%	
Manganese	A	mg/L	0.05399	0.05399		0.05	0	0	3.649E-05	0.01	18	108%	90	110	0%	
Mercury	A	mg/L	0.001036	0.001036		0.001	0	0	1.289E-05	0.001	0.36	104%	90	110	0%	
Molybdenum	A	mg/L	0.05233	0.05233		0.05	0	0	2.302E-05	0.005	9	105%	90	110	0%	
Nickel	A	mg/L	0.05176	0.05176		0.05	0	0	7.128E-05	0.01	4.5	104%	90	110	0%	
Selenium	A	mg/L	0.05171	0.05171		0.05	0	0	0.0001532	0.005	18	103%	90	110	0%	
Silver	A	mg/L	0.0195	0.0195		0.02	0	0	2.959E-05	0.005	1.8	98%	90	110	0%	
Strontium	A	mg/L	0.05056	0.05056		0.05	0	0	1.229E-05	0.1	18	101%	90	110	0%	
Thallium	A	mg/L	0.05169	0.05169		0.05	0	0	1.434E-05	0.1	18	103%	90	110	0%	
Thorium	A	mg/L	0.04474	0.04474		0.05	0	0	5.767E-05	0.001	4.5	89%	90	110	0%	S
Thorium 232	A	mg/L	0.04474	0.04474		0.05	0	0	5.767E-05	0.01	4.5	89%	90	110	0%	S
Tin	A	mg/L	0.0497	0.0497		0.05	0	0	5.199E-05	0.1	9	99%	90	110	0%	
Titanium	A	mg/L	0.05354	0.05354		0.05	0	0	0.0001736	0.01	18	107%	90	110	0%	
Uranium	A	mg/L	0.04902	0.04902		0.05	0	0	1.332E-05	0.001	4.5	98%	90	110	0%	
Vanadium	A	mg/L	0.05257	0.05257		0.05	0	0	7.351E-05	0.1	18	105%	90	110	0%	
Zinc	A	mg/L	0.05152	0.05152		0.05	0	0	0.0002495	0.01	4.5	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699522	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:42:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000298	0.000298		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000221	0.000221		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.002114	0.002114		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000002	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001673	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000024	0.000024		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000242	0.000242		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000195	0.000195		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000165	0.000165		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000118	0.000118		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.01166	0.01166		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000236	0.000236		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000378	0.000378		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699522	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 2:42:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Manganese	A	mg/L	0.001078	0.001078		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000009	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000528	0.000528		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000133	0.000133		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000238	0.000238		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000143	0.000143		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000122	0.000122		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.001357	0.001357		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000892	0.000892		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000281	0.000281		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000138	0.000138		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000133	0.000133		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	-0.000062	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699523	CCB	ICPMS-6020-W-	CCB		2/14/2018 2:45:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.003728	0.003728		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.00013	0.00013		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000109	0.000109		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.001285	0.001285		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000029	-0.000029		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002406	-0.002406		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000007	-0.000007		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000159	0.000159		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.00017	0.00017		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	0.000111	0.000111		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000091	0.000091		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.007978	0.007978		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000164	0.000164		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.00027	0.00027		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000753	0.000753		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000009	-0.000009		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000175	0.000175		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699523	CCB	ICPMS-6020-W-	CCB		2/14/2018 2:45:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/L	-0.000026	-0.000026		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000022	-0.000022		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000069	0.000069		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000065	0.000065		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.001214	0.001214		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000257	0.000257		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000257	0.000257		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000304	0.000304		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000211	0.000211		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000046	0.000046		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.00008	0.00008		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000096	-0.000096		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699524	MB-118411	6010.20-SPLP	MBLK		2/14/2018 2:47:0	1	118411	2/12/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.05117	0.05117		0	0	0	0.002004	0.03	5	0%	0	0	0%	
Antimony	A	mg/L	0.000504	0.000504		0	0	0	2.034E-05	0.001	5	0%	0	0	0%	
Arsenic	A	mg/L	0.000131	0		0	0	0	0.0002765	0.001	5	0%	0	0	0%	
Barium	A	mg/L	0.009693	0.009693		0	0	0	0.0000743	0.05	5	0%	0	0	0%	
Beryllium	A	mg/L	-0.000078	0		0	0	0	0.0000149	0.001	5	0%	0	0	0%	
Boron	A	mg/L	0.06271	0.06271		0	0	0	0.00105	0.05	5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000211	0		0	0	0	5.453E-05	0.001	5	0%	0	0	0%	
Chromium	A	mg/L	0.001808	0.001808		0	0	0	0.0002192	0.005	5	0%	0	0	0%	
Cobalt	A	mg/L	0.000001	0		0	0	0	8.706E-05	0.005	5	0%	0	0	0%	
Copper	A	mg/L	0.000152	0		0	0	0	0.0001527	0.005	5	0%	0	0	0%	
Lead	A	mg/L	0.000484	0.000484		0	0	0	2.616E-05	0.001	5	0%	0	0	0%	
Manganese	A	mg/L	0.000524	0.000524		0	0	0	8.486E-05	0.001	5	0%	0	0	0%	
Molybdenum	A	mg/L	0.000803	0.000803		0	0	0	4.274E-05	0.001	5	0%	0	0	0%	
Nickel	A	mg/L	0.000846	0.000846		0	0	0	4.727E-05	0.005	5	0%	0	0	0%	
Selenium	A	mg/L	-0.000012	0		0	0	0	0.0002549	0.001	5	0%	0	0	0%	
Silver	A	mg/L	0.000559	0.000559		0	0	0	7.125E-05	0.001	0.25	0%	0	0	0%	
Strontium	A	mg/L	0.001654	0.001654		0	0	0	1.468E-05	0.01	5	0%	0	0	0%	
Thallium	A	mg/L	0.00094	0.00094		0	0	0	2.645E-05	0.0005	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699524	MB-118411	6010.20-SPLP	MBLK		2/14/2018 2:47:0	1	118411	2/12/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.002257	0.002257		0	0	0	0.0002018	0.05	5	0%	0	0	0%	
Titanium	A	mg/L	0.001484	0.001484		0	0	0	0.0002352	0.005	5	0%	0	0	0%	
Uranium	A	mg/L	0.000035	0.000035		0	0	0	1.822E-05	0.0003	5	0%	0	0	0%	
Vanadium	A	mg/L	0.00013	0		0	0	0	0.0007003	0.01	5	0%	0	0	0%	
Zinc	A	mg/L	0.001843	0.001843		0	0	0	0.0004146	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699525	B18020068-001	6010.20-SPLP	SAMP		2/14/2018 2:50:0	1	118411	2/12/2018 8:	0	0	8.11

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.06988	0.13976		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Antimony	B	mg/L	0.000613	0.001226		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Arsenic	B	mg/L	0.004197	0.008394		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000043	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.01642	0.03284		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.004094	0.008188		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.006823	0.013646		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.009588	0.019176		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.08875	0.1775		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.004174	0.008348		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.008764	0.017528		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	0.00021	0.00042		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	J
Strontium	B	mg/L	0.06508	0.13016		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.002594	0.005188		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.172	0.344		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.004352	0.008704		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.03372	0.06744		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.0365	0.073		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699526	B18020068-001	6010.20-SPLP	SD		2/14/2018 2:53:0	5	118411	2/12/2018 8:	0	1E+07	8.11

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699526	B18020068-001	6010.20-SPLP	SD		2/14/2018 2:53:0	5	118411	2/12/2018 8:	0	1E+07	8.11

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	3.807	38.07		0	0	37.34	0.02004	0.03	5	0%			2%	
Antimony	A	mg/L	0.000034	0.00034		0	0	0.001226	0.0002034	0.001	5	0%				N
Arsenic	A	mg/L	0.000838	0.00838		0	0	0.008394	0.002765	0.002765	5	0%				N
Barium	A	mg/L	0.01402	0.1402		0	0	0.13976	0.000743	0.05	5	0%			0%	
Beryllium	A	mg/L	0.000086	0.00086		0	0	0.001388	0.000149	0.001	5	0%				N
Boron	A	mg/L	0.033	0.33		0	0	0.3322	0.0105	0.05	5	0%			1%	
Cadmium	A	mg/L	-0.000046	0		0	0	0	0.0005453	0.001	5	0%				
Chromium	A	mg/L	0.003262	0.03262		0	0	0.03284	0.002192	0.005	5	0%			1%	
Cobalt	A	mg/L	0.000678	0.00678		0	0	0.008188	0.0008706	0.005	5	0%				N
Copper	A	mg/L	0.001338	0.01338		0	0	0.013646	0.001527	0.005	5	0%				N
Lead	A	mg/L	0.00228	0.0228		0	0	0.019176	0.0002616	0.001	5	0%			17%	R
Manganese	A	mg/L	0.0176	0.176		0	0	0.1775	0.0008486	0.001	5	0%			1%	
Molybdenum	A	mg/L	0.000707	0.00707		0	0	0.008348	0.0004274	0.001	5	0%			17%	R
Nickel	A	mg/L	0.001661	0.01661		0	0	0.017528	0.0004727	0.005	5	0%			5%	
Selenium	A	mg/L	0.000123	0		0	0	0	0.002549	0.002549	5	0%				
Silver	A	mg/L	-0.000044	0		0	0	0.00042	0.0007125	0.001	0.25	0%				
Strontium	A	mg/L	0.0125	0.125		0	0	0.13016	0.0001468	0.01	5	0%			4%	
Thallium	A	mg/L	0.000174	0.00174		0	0	0.000952	0.0002645	0.0005	5	0%				N
Tin	A	mg/L	0.00032	0.0032		0	0	0.005188	0.002018	0.05	5	0%				N
Titanium	A	mg/L	0.03571	0.3571		0	0	0.344	0.002352	0.005	5	0%			4%	
Uranium	A	mg/L	0.000758	0.00758		0	0	0.008704	0.0001822	0.0003	5	0%			14%	R
Vanadium	A	mg/L	0.006434	0.06434		0	0	0.06744	0.007003	0.01	5	0%				N
Zinc	A	mg/L	0.00733	0.0733		0	0	0.073	0.004146	0.01	5	0%			0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699527	B18020068-002	6010.20-SPLP	SAMP		2/14/2018 2:55:0	1	118411	2/12/2018 8:	0	0	23.57

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.02914	0.05828		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Thallium	A	mg/L	0.000156	0.000312		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Antimony	B	mg/L	0.000303	0.000606		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Arsenic	B	mg/L	0.000004	0		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000101	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.005293	0.010586		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.000423	0.000846		0	0	0	0.0001741	0.005	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699527	B18020068-002	6010.20-SPLP	SAMP		2/14/2018 2:55:0	1	118411	2/12/2018 8:	0	0	23.57

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	B	mg/L	0.001752	0.003504		0	0	0	0.0003054	0.005	5	0%	0	0	0%	J
Manganese	B	mg/L	0.01402	0.02804		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.00232	0.00464		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.002381	0.004762		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	J
Silver	B	mg/L	0.000055	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.07972	0.15944		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.001508	0.003016		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.04667	0.09334		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.004058	0.008116		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.004495	0.00899		0	0	0	0.0014006	0.01	5	0%	0	0	0%	J
Zinc	B	mg/L	0.006447	0.012894		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699528	B18020068-003	6010.20-SPLP	SAMP		2/14/2018 2:58:0	1	118411	2/12/2018 8:	0	0	14.9

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	A	mg/L	0.002059	0.004118		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	A	mg/L	0.2278	0.4556		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Antimony	B	mg/L	0.000814	0.001628		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	0.000051	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.02837	0.05674		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.006181	0.012362		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.0177	0.0354		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.01216	0.02432		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.3212	0.6424		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.003587	0.007174		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.01187	0.02374		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	0.000089	0.000178		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	J
Strontium	B	mg/L	0.1752	0.3504		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.00277	0.00554		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.2392	0.4784		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.009143	0.018286		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.07016	0.14032		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.05818	0.11636		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699529	B18020068-004	6010.20-SPLP	SAMP		2/14/2018 3:01:0	1	118411	2/12/2018 8:	0	0	10.1

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	A	mg/L	0.001262	0.002524		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	A	mg/L	0.02307	0.04614		0	0	0	0.0001486	0.05	5	0%	0	0	0%	J
Manganese	A	mg/L	0.008004	0.016008		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	A	mg/L	0.001101	0.002202		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Thallium	A	mg/L	0.000061	0.000122		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Uranium	A	mg/L	0.001099	0.002198		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Antimony	B	mg/L	0.000323	0.000646		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Cadmium	B	mg/L	-0.000174	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.00342	0.00684		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.000219	0.000438		0	0	0	0.0001741	0.005	5	0%	0	0	0%	J
Copper	B	mg/L	0.001058	0.002116		0	0	0	0.0003054	0.005	5	0%	0	0	0%	J
Nickel	B	mg/L	0.001132	0.002264		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	J
Silver	B	mg/L	-0.000007	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.03054	0.06108		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.001355	0.00271		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.03435	0.0687		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Vanadium	B	mg/L	0.005231	0.010462		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.005817	0.011634		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699530	B18020068-005	6010.20-SPLP	SAMP		2/14/2018 3:03:0	1	118411	2/12/2018 8:	0	0	1.42

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	0.4634	0.9268		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Thallium	A	mg/L	0.00016	0.00032		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Antimony	B	mg/L	0.000564	0.001128		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Arsenic	B	mg/L	0.008705	0.01741		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	0.000046	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.009831	0.019662		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.006118	0.012236		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.005845	0.01169		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.008389	0.016778		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.81	1.62		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.002384	0.004768		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.008197	0.016394		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699530	B18020068-005	6010.20-SPLP	SAMP		2/14/2018 3:03:0	1	118411	2/12/2018 8:	0	0	1.42

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	B	mg/L	-0.000015	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.06957	0.13914		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.001618	0.003236		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.1623	0.3246		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.001364	0.002728		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.03735	0.0747		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.03053	0.06106		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699531	B18020068-006	6010.20-SPLP	SAMP		2/14/2018 3:06:0	1	118411	2/12/2018 8:	0	0	6.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/L	0.000549	0.001098		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Arsenic	B	mg/L	0.005676	0.011352		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.2395	0.479		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000066	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.05383	0.10766		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.006341	0.012682		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.01137	0.02274		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.01001	0.02002		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.1658	0.3316		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.002036	0.004072		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.01428	0.02856		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	0.000004	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.1544	0.3088		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.002802	0.005604		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.2159	0.4318		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.006123	0.012246		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.05479	0.10958		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.05787	0.11574		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699532	B18020068-007	6010.20-SPLP	SAMP		2/14/2018 3:08:0	1	118411	2/12/2018 8:	0	0	14.4

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/L	0.000458	0.000916		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Arsenic	B	mg/L	0.008025	0.01605		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.3071	0.6142		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000031	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.03093	0.06186		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.006418	0.012836		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.01138	0.02276		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.01236	0.02472		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.3799	0.7598		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.002515	0.00503		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.01442	0.02884		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	-0.000007	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.2599	0.5198		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.002323	0.004646		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.2481	0.4962		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.005598	0.011196		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.05515	0.1103		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.05428	0.10856		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699533	B18020068-008	6010.20-SPLP	SAMP		2/14/2018 3:11:0	1	118411	2/12/2018 8:	0	0	0.84

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	0.004216	0.008432		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Thallium	A	mg/L	0.000068	0.000136		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Antimony	B	mg/L	0.00035	0.0007		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Arsenic	B	mg/L	0.002339	0.004678		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.07908	0.15816		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000186	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.008041	0.016082		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.002612	0.005224		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.003487	0.006974		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Manganese	B	mg/L	0.08766	0.17532		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.001714	0.003428		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.004861	0.009722		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699533	B18020068-008	6010.20-SPLP	SAMP		2/14/2018 3:11:0	1	118411	2/12/2018 8:	0	0	0.84

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	B	mg/L	-0.00004	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.02177	0.04354		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.001435	0.00287		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.09574	0.19148		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Vanadium	B	mg/L	0.0167	0.0334		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.0142	0.0284		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699534	CCV	ICPMS-6020-W-	CCV		2/14/2018 3:14:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.1065	0.1065		0.05	0	0	0.0002849	0.1	4.5	213%	90	110	0%	S
Antimony	A	mg/L	0.04798	0.04798		0.05	0	0	3.047E-05	0.05	18	96%	90	110	0%	
Arsenic	A	mg/L	0.04922	0.04922		0.05	0	0	6.629E-05	0.005	18	98%	90	110	0%	
Barium	A	mg/L	0.04883	0.04883		0.05	0	0	6.437E-05	0.1	18	98%	90	110	0%	
Beryllium	A	mg/L	0.04974	0.04974		0.05	0	0	8.97E-06	0.001	4.5	99%	90	110	0%	
Boron	A	mg/L	0.04991	0.04991		0.05	0	0	0.00141	0.1	4.5	100%	90	110	0%	
Cadmium	A	mg/L	0.04892	0.04892		0.05	0	0	1.468E-05	0.001	18	98%	90	110	0%	
Cerium	A	mg/L	0.04875	0.04875		0.05	0	0	2.257E-05	0.001	4.5	98%	90	110	0%	
Chromium	A	mg/L	0.05157	0.05157		0.05	0	0	5.576E-05	0.01	18	103%	90	110	0%	
Cobalt	A	mg/L	0.05129	0.05129		0.05	0	0	3.904E-05	0.01	18	103%	90	110	0%	
Copper	A	mg/L	0.05125	0.05125		0.05	0	0	7.681E-05	0.01	4.5	102%	90	110	0%	
Iron	A	mg/L	1.366	1.366		1.3	0	0	0.000175	0.02	4.5	105%	90	110	0%	
Lanthanum	A	mg/L	0.04812	0.04812		0.05	0	0	0.0000111	0.001	4.5	96%	90	110	0%	
Lead	A	mg/L	0.05062	0.05062		0.05	0	0	2.956E-05	0.01	18	101%	90	110	0%	
Manganese	A	mg/L	0.05222	0.05222		0.05	0	0	3.649E-05	0.01	18	104%	90	110	0%	
Mercury	A	mg/L	0.001026	0.001026		0.001	0	0	1.289E-05	0.001	0.36	103%	90	110	0%	
Molybdenum	A	mg/L	0.04881	0.04881		0.05	0	0	2.302E-05	0.005	9	98%	90	110	0%	
Nickel	A	mg/L	0.05125	0.05125		0.05	0	0	7.128E-05	0.01	4.5	102%	90	110	0%	
Selenium	A	mg/L	0.0499	0.0499		0.05	0	0	0.0001532	0.005	18	100%	90	110	0%	
Silver	A	mg/L	0.01824	0.01824		0.02	0	0	2.959E-05	0.005	1.8	91%	90	110	0%	
Strontium	A	mg/L	0.04996	0.04996		0.05	0	0	1.229E-05	0.1	18	100%	90	110	0%	
Thallium	A	mg/L	0.05066	0.05066		0.05	0	0	1.434E-05	0.1	18	101%	90	110	0%	
Thorium	A	mg/L	0.04059	0.04059		0.05	0	0	5.767E-05	0.001	4.5	81%	90	110	0%	S
Thorium 232	A	mg/L	0.04059	0.04059		0.05	0	0	5.767E-05	0.01	4.5	81%	90	110	0%	S

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699534	CCV	ICPMS-6020-W-	CCV		2/14/2018 3:14:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Tin	A	mg/L	0.04788	0.04788		0.05	0	0	5.199E-05	0.1	9	96%	90	110	0%	
Titanium	A	mg/L	0.05236	0.05236		0.05	0	0	0.0001736	0.01	18	105%	90	110	0%	
Uranium	A	mg/L	0.0481	0.0481		0.05	0	0	1.332E-05	0.001	4.5	96%	90	110	0%	
Vanadium	A	mg/L	0.05152	0.05152		0.05	0	0	7.351E-05	0.1	18	103%	90	110	0%	
Zinc	A	mg/L	0.05117	0.05117		0.05	0	0	0.0002495	0.01	4.5	102%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699535	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 3:16:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000062	0.000062		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	-0.00005	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000182	0.000182		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000076	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001228	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.00007	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000068	0.000068		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000058	0.000058		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	-0.000041	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000107	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000048	0.000048		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.00043	0.00043		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000206	0.000206		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000001	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000261	0.000261		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	-0.000107	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000041	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.00001	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.00006	0.00006		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000612	0.000612		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000605	0.000605		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000506	0.000506		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	-0.000056	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.00003	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000246	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699535	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 3:16:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11699536	CCB	ICPMS-6020-W-	CCB		2/14/2018 3:19:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01637	0.01637		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.00004	-0.00004		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000071	-0.000071		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000033	0.000033		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000102	-0.000102		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.002655	-0.002655		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000081	-0.000081		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.00004	0.00004		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000018	0.000018		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000051	-0.000051		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.00006	-0.00006		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01492	0.01492		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000027	0.000027		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000278	0.000278		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000096	0.000096		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000012	-0.000012		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000002	-0.000002		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000103	-0.000103		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.00001	0.00001		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000062	-0.000062		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000004	0.000004		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.000775	0.000775		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000046	0.000046		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000046	0.000046		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000161	0.000161		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000049	0.000049		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000094	-0.000094		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000008	0.000008		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000112	-0.000112		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700146	B18020068-009	6010.20-SPLP	SAMP		2/14/2018 3:22:0	1	118411	2/12/2018 8:	0	0	3.91

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/L	0.000936	0.001872		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Arsenic	B	mg/L	0.01051	0.02102		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.5487	1.0974		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Cadmium	B	mg/L	0.000164	0.000328		0	0	0	0.0001091	0.001	5	0%	0	0	0%	J
Chromium	B	mg/L	0.05107	0.10214		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.01559	0.03118		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.01748	0.03496		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.01916	0.03832		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.7507	1.5014		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.007156	0.014312		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.02451	0.04902		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	0.000447	0.000894		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	J
Strontium	B	mg/L	0.1918	0.3836		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.003567	0.007134		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.4349	0.8698		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.00336	0.00672		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.0712	0.1424		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.07784	0.15568		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700147	B18020068-010	6010.20-SPLP	SAMP		2/14/2018 3:24:0	1	118411	2/12/2018 8:	0	0	19.52

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	0.004406	0.008812		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Thallium	A	mg/L	0.00014	0.00028		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Antimony	B	mg/L	0.000392	0.000784		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Arsenic	B	mg/L	0.000637	0.001274		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.08813	0.17626		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000156	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.0111	0.0222		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.001933	0.003866		0	0	0	0.0001741	0.005	5	0%	0	0	0%	J
Copper	B	mg/L	0.005723	0.011446		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Manganese	B	mg/L	0.05483	0.10966		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.001448	0.002896		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.004768	0.009536		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700147	B18020068-010	6010.20-SPLP	SAMP		2/14/2018 3:24:0	1	118411	2/12/2018 8:	0	0	19.52

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	B	mg/L	0.000075	0.00015		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	J
Strontium	B	mg/L	0.09511	0.19022		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.001888	0.003776		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.1309	0.2618		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.001403	0.002806		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.01888	0.03776		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.02587	0.05174		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700148	B18020068-011	6010.20-SPLP	SAMP		2/14/2018 3:27:0	1	118411	2/12/2018 8:	0	0	13.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/L	0.000693	0.001386		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Arsenic	B	mg/L	0.01012	0.02024		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.27	0.54		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Beryllium	B	mg/L	0.001781	0.003562		0	0	0	0.0000298	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	0.000008	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.02954	0.05908		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.01413	0.02826		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.01469	0.02938		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.02215	0.0443		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.3177	0.6354		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.001751	0.003502		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.02008	0.04016		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	0.000035	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.1483	0.2966		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.002896	0.005792		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.3043	0.6086		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.003613	0.007226		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.07099	0.14198		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.0724	0.1448		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700149	B18020068-012	6010.20-SPLP	SAMP		2/14/2018 3:30:0	1	118411	2/12/2018 8:	0	0	19.92

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.000126	0.000252		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Antimony	B	mg/L	0.0003	0.0006		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Arsenic	B	mg/L	0.001941	0.003882		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.1515	0.303		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Beryllium	B	mg/L	0.000569	0.001138		0	0	0	0.0000298	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	-0.00012	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.01279	0.02558		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.003286	0.006572		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.006896	0.013792		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.006734	0.013468		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.07533	0.15066		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.00112	0.00224		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.006991	0.013982		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	-0.00002	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.1039	0.2078		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.001643	0.003286		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.1781	0.3562		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.006336	0.012672		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.02251	0.04502		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.02562	0.05124		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700150	B18020068-013	6010.20-SPLP	SAMP		2/14/2018 3:32:0	1	118411	2/12/2018 8:	0	0	21.19

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.00001	0		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	
Antimony	B	mg/L	0.000272	0.000544		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Arsenic	B	mg/L	0.001827	0.003654		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.0387	0.0774		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Beryllium	B	mg/L	0.000015	0.00003		0	0	0	0.0000298	0.001	5	0%	0	0	0%	J
Cadmium	B	mg/L	-0.000213	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.003359	0.006718		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.000328	0.000656		0	0	0	0.0001741	0.005	5	0%	0	0	0%	J
Copper	B	mg/L	0.001996	0.003992		0	0	0	0.0003054	0.005	5	0%	0	0	0%	J
Manganese	B	mg/L	0.01275	0.0255		0	0	0	0.0001697	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700150	B18020068-013	6010.20-SPLP	SAMP		2/14/2018 3:32:0	1	118411	2/12/2018 8:	0	0	21.19

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	B	mg/L	0.02203	0.04406		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.001489	0.002978		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	J
Silver	B	mg/L	-0.000024	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.04674	0.09348		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.001224	0.002448		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.04722	0.09444		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.0838	0.1676		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.007967	0.015934		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.006555	0.01311		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700151	B18020068-014	6010.20-SPLP	SAMP		2/14/2018 3:35:0	1	118411	2/12/2018 8:	0	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.000041	0.000082		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Antimony	B	mg/L	0.000449	0.000898		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Arsenic	B	mg/L	0.004853	0.009706		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.08347	0.16694		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Beryllium	B	mg/L	0.000118	0.000236		0	0	0	0.0000298	0.001	5	0%	0	0	0%	J
Cadmium	B	mg/L	-0.000167	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.004476	0.008952		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.003922	0.007844		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.002714	0.005428		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.005664	0.011328		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.255	0.51		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.01701	0.03402		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.00491	0.00982		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	-0.000052	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.03127	0.06254		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.00116	0.00232		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.05734	0.11468		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.02308	0.04616		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.01702	0.03404		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.01089	0.02178		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700152	B18020068-015	6010.20-SPLP	SAMP		2/14/2018 3:37:0	1	118411	2/12/2018 8:	0	0	18.13

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.000005	0		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	
Antimony	B	mg/L	0.000184	0.000368		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Arsenic	B	mg/L	0.000313	0.000626		0	0	0	0.000553	0.001	5	0%	0	0	0%	J
Barium	B	mg/L	0.05082	0.10164		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Beryllium	B	mg/L	0.000039	0.000078		0	0	0	0.0000298	0.001	5	0%	0	0	0%	J
Cadmium	B	mg/L	-0.000147	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.003782	0.007564		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.000431	0.000862		0	0	0	0.0001741	0.005	5	0%	0	0	0%	J
Copper	B	mg/L	0.001389	0.002778		0	0	0	0.0003054	0.005	5	0%	0	0	0%	J
Manganese	B	mg/L	0.01312	0.02624		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.000757	0.001514		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.001735	0.00347		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	J
Silver	B	mg/L	-0.000065	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.1063	0.2126		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.001238	0.002476		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.04314	0.08628		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.004073	0.008146		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.00454	0.00908		0	0	0	0.0014006	0.01	5	0%	0	0	0%	J
Zinc	B	mg/L	0.005789	0.011578		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700153	B18020068-016	6010.20-SPLP	SAMP		2/14/2018 3:40:0	1	118411	2/12/2018 8:	0	0	21.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	A	mg/L	0.001049	0.002098		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Lead	A	mg/L	0.005331	0.010662		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Antimony	B	mg/L	0.000384	0.000768		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Barium	B	mg/L	0.1147	0.2294		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Beryllium	B	mg/L	0.00063	0.00126		0	0	0	0.0000298	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	-0.000118	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.01645	0.0329		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.003723	0.007446		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.008499	0.016998		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Manganese	B	mg/L	0.1277	0.2554		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.002083	0.004166		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700153	B18020068-016	6010.20-SPLP	SAMP		2/14/2018 3:40:0	1	118411	2/12/2018 8:	0	0	21.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	B	mg/L	0.009073	0.018146		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	-0.000032	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.1261	0.2522		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Thallium	B	mg/L	0.000115	0.00023		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Tin	B	mg/L	0.00187	0.00374		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.1517	0.3034		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.003707	0.007414		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.02637	0.05274		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.03146	0.06292		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700154	B18020068-017	6010.20-SPLP	SAMP		2/14/2018 3:43:0	1	118411	2/12/2018 8:	0	0	11.51

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	0.007396	0.014792		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Thallium	A	mg/L	0.00005	0.0001		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Antimony	B	mg/L	0.000731	0.001462		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Arsenic	B	mg/L	0.009079	0.018158		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.1528	0.3056		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Beryllium	B	mg/L	0.000368	0.000736		0	0	0	0.0000298	0.001	5	0%	0	0	0%	J
Cadmium	B	mg/L	-0.00004	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.006087	0.012174		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.008958	0.017916		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.006126	0.012252		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Manganese	B	mg/L	0.4635	0.927		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.001724	0.003448		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.008667	0.017334		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	-0.000042	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.05266	0.10532		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.001233	0.002466		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.125	0.25		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.01479	0.02958		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.02286	0.04572		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.02162	0.04324		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700155	B18020068-018	6010.20-SPLP	SAMP		2/14/2018 3:45:0	1	118411	2/12/2018 8:	0	0	15.08

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	A	mg/L	0.003358	0.006716		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Beryllium	A	mg/L	0.001343	0.002686		0	0	0	0.0000298	0.001	5	0%	0	0	0%	
Antimony	B	mg/L	0.000877	0.001754		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Barium	B	mg/L	0.1602	0.3204		0	0	0	0.0001486	0.05	5	0%	0	0	0%	
Cadmium	B	mg/L	0.000019	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.02805	0.0561		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.006743	0.013486		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.02049	0.04098		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.01407	0.02814		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Manganese	B	mg/L	0.8733	1.7466		0	0	0	0.0001697	0.001	5	0%	0	0	0%	
Molybdenum	B	mg/L	0.003245	0.00649		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.01302	0.02604		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	0.000013	0		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.2211	0.4422		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Thallium	B	mg/L	0.000239	0.000478		0	0	0	0.0000529	0.0005	5	0%	0	0	0%	J
Tin	B	mg/L	0.002567	0.005134		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.2627	0.5254		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.003822	0.007644		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.06346	0.12692		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.06197	0.12394		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700156	CCV	ICPMS-6020-W-	CCV		2/14/2018 3:48:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.1089	0.1089		0.05	0	0	0.0002849	0.1	4.5	218%	90	110	0%	S
Antimony	A	mg/L	0.04848	0.04848		0.05	0	0	3.047E-05	0.05	18	97%	90	110	0%	
Arsenic	A	mg/L	0.04974	0.04974		0.05	0	0	6.629E-05	0.005	18	99%	90	110	0%	
Barium	A	mg/L	0.04813	0.04813		0.05	0	0	6.437E-05	0.1	18	96%	90	110	0%	
Beryllium	A	mg/L	0.04958	0.04958		0.05	0	0	8.97E-06	0.001	4.5	99%	90	110	0%	
Boron	A	mg/L	0.05196	0.05196		0.05	0	0	0.00141	0.1	4.5	104%	90	110	0%	
Cadmium	A	mg/L	0.04915	0.04915		0.05	0	0	1.468E-05	0.001	18	98%	90	110	0%	
Cerium	A	mg/L	0.04896	0.04896		0.05	0	0	2.257E-05	0.001	4.5	98%	90	110	0%	
Chromium	A	mg/L	0.05182	0.05182		0.05	0	0	5.576E-05	0.01	18	104%	90	110	0%	
Cobalt	A	mg/L	0.05241	0.05241		0.05	0	0	3.904E-05	0.01	18	105%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700156	CCV	ICPMS-6020-W-	CCV		2/14/2018 3:48:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	A	mg/L	0.05137	0.05137		0.05	0	0	7.681E-05	0.01	4.5	103%	90	110	0%	
Iron	A	mg/L	1.395	1.395		1.3	0	0	0.000175	0.02	4.5	107%	90	110	0%	
Lanthanum	A	mg/L	0.04804	0.04804		0.05	0	0	0.0000111	0.001	4.5	96%	90	110	0%	
Lead	A	mg/L	0.0512	0.0512		0.05	0	0	2.956E-05	0.01	18	102%	90	110	0%	
Manganese	A	mg/L	0.05409	0.05409		0.05	0	0	3.649E-05	0.01	18	108%	90	110	0%	
Mercury	A	mg/L	0.001028	0.001028		0.001	0	0	1.289E-05	0.001	0.36	103%	90	110	0%	
Molybdenum	A	mg/L	0.04938	0.04938		0.05	0	0	2.302E-05	0.005	9	99%	90	110	0%	
Nickel	A	mg/L	0.05228	0.05228		0.05	0	0	7.128E-05	0.01	4.5	105%	90	110	0%	
Selenium	A	mg/L	0.05045	0.05045		0.05	0	0	0.0001532	0.005	18	101%	90	110	0%	
Silver	A	mg/L	0.0183	0.0183		0.02	0	0	2.959E-05	0.005	1.8	92%	90	110	0%	
Strontium	A	mg/L	0.05163	0.05163		0.05	0	0	1.229E-05	0.1	18	103%	90	110	0%	
Thallium	A	mg/L	0.05081	0.05081		0.05	0	0	1.434E-05	0.1	18	102%	90	110	0%	
Thorium	A	mg/L	0.04231	0.04231		0.05	0	0	5.767E-05	0.001	4.5	85%	90	110	0%	S
Thorium 232	A	mg/L	0.04231	0.04231		0.05	0	0	5.767E-05	0.01	4.5	85%	90	110	0%	S
Tin	A	mg/L	0.049	0.049		0.05	0	0	5.199E-05	0.1	9	98%	90	110	0%	
Titanium	A	mg/L	0.0542	0.0542		0.05	0	0	0.0001736	0.01	18	108%	90	110	0%	
Uranium	A	mg/L	0.0488	0.0488		0.05	0	0	1.332E-05	0.001	4.5	98%	90	110	0%	
Vanadium	A	mg/L	0.05219	0.05219		0.05	0	0	7.351E-05	0.1	18	104%	90	110	0%	
Zinc	A	mg/L	0.05146	0.05146		0.05	0	0	0.0002495	0.01	4.5	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700157	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 3:51:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000046	0.000046		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	-0.000077	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000074	0.000074		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	-0.000062	0		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.001757	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000067	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000069	0.000069		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000052	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000046	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000069	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000049	0.000049		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700157	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 3:51:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lead	A	mg/L	0.000504	0.000504		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.000495	0.000495		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000003	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000252	0.000252		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	-0.000075	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000001	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000005	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.0001	0.0001		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000493	0.000493		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000609	0.000609		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000113	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000061	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000027	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000241	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700158	CCB	ICPMS-6020-W-	CCB		2/14/2018 3:53:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.014	0.014		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000047	-0.000047		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000071	-0.000071		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.000025	0.000025		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000095	-0.000095		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.00215	-0.00215		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000078	-0.000078		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000039	0.000039		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000018	0.000018		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000038	-0.000038		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000047	-0.000047		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01738	0.01738		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000019	0.000019		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000304	0.000304		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.000212	0.000212		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	-0.000013	-0.000013		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700158	CCB	ICPMS-6020-W-	CCB		2/14/2018 3:53:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	A	mg/L	-0.000017	-0.000017		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000089	-0.000089		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000085	0.000085		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.00007	-0.00007		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000002	0.000002		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	0.000641	0.000641		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000026	0.000026		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000026	0.000026		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000129	0.000129		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000004	-0.000004		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000094	-0.000094		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000009	-0.000009		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000153	-0.000153		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700159	LCS-118411	6010.20-SPLP	LCS		2/14/2018 3:56:0	1	118411	2/12/2018 8:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.719	2.719		2.5	0.05117	0	0.002004	0.03	5	107%	80	120	0%	
Antimony	A	mg/L	0.4964	0.4964		0.5	0.000504	0	2.034E-05	0.001	5	99%	80	120	0%	
Arsenic	A	mg/L	0.4815	0.4815		0.5	0	0	0.0002765	0.001	5	96%	80	120	0%	
Barium	A	mg/L	5.307	5.307		5.5	0.009693	0	0.0000743	0.05	5	96%	80	120	0%	
Beryllium	A	mg/L	0.2284	0.2284		0.25	0	0	0.0000149	0.001	5	91%	80	120	0%	
Boron	A	mg/L	0.5588	0.5588		0.5	0.06271	0	0.00105	0.05	5	99%	80	120	0%	
Cadmium	A	mg/L	0.234	0.234		0.25	0	0	5.453E-05	0.001	5	94%	80	120	0%	
Chromium	A	mg/L	0.531	0.531		0.5	0.001808	0	0.0002192	0.005	5	106%	80	120	0%	
Cobalt	A	mg/L	0.524	0.524		0.5	0	0	8.706E-05	0.005	5	105%	80	120	0%	
Copper	A	mg/L	0.5052	0.5052		0.5	0	0	0.0001527	0.005	5	101%	80	120	0%	
Lead	A	mg/L	0.509	0.509		0.5	0.000484	0	2.616E-05	0.001	5	102%	80	120	0%	
Manganese	A	mg/L	2.612	2.612		2.5	0.000524	0	8.486E-05	0.001	5	104%	80	120	0%	
Molybdenum	A	mg/L	0.5349	0.5349		0.5	0.000803	0	4.274E-05	0.001	5	107%	80	120	0%	
Nickel	A	mg/L	0.5194	0.5194		0.5	0.000846	0	4.727E-05	0.005	5	104%	80	120	0%	
Selenium	A	mg/L	0.397	0.397		0.5	0	0	0.0002549	0.001	5	79%	80	120	0%	S
Silver	A	mg/L	0.2589	0.2589		0.25	0.000559	0	7.125E-05	0.001	0.25	103%	80	120	0%	
Strontium	A	mg/L	0.5284	0.5284		0.5	0.001654	0	1.468E-05	0.01	5	105%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700159	LCS-118411	6010.20-SPLP	LCS		2/14/2018 3:56:0	1	118411	2/12/2018 8:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.4985	0.4985		0.5	0.00094	0	2.645E-05	0.0005	5	100%	80	120	0%	
Tin	A	mg/L	0.5557	0.5557		0.5	0.002257	0	0.0002018	0.05	5	111%	80	120	0%	
Titanium	A	mg/L	0.5678	0.5678		0.5	0.001484	0	0.0002352	0.005	5	113%	80	120	0%	
Uranium	A	mg/L	0.5317	0.5317		0.5	0.000035	0	1.822E-05	0.0003	5	106%	80	120	0%	
Vanadium	A	mg/L	0.552	0.552		0.5	0	0	0.0007003	0.01	5	110%	80	120	0%	
Zinc	A	mg/L	0.4477	0.4477		0.5	0.001843	0	0.0004146	0.01	5	89%	80	120	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700160	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 3:58:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000497	0.000497		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000528	0.000528		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.004914	0.004914		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000119	0.000119		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	0.001387	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000142	0.000142		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000467	0.000467		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.0006	0.0006		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000389	0.000389		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000365	0.000365		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.01386	0.01386		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.00048	0.00048		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.001036	0.001036		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.002706	0.002706		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000018	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000735	0.000735		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000384	0.000384		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000587	0.000587		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000188	0.000188		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000407	0.000407		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000721	0.000721		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000514	0.000514		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000533	0.000533		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000362	0.000362		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700160	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 3:58:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	0.000431	0.000431		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000145	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700161	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 4:01:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000176	0.000176		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000225	0.000225		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	0.002651	0.002651		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000041	0.000041		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	-0.000474	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000042	0.000042		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000262	0.000262		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000292	0.000292		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.0002	0.0002		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000158	0.000158		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.01134	0.01134		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000276	0.000276		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000541	0.000541		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Manganese	A	mg/L	0.001518	0.001518		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	-0.000017	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000192	0.000192		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.00019	0.00019		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000164	0.000164		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000054	0.000054		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000201	0.000201		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000812	0.000812		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.000216	0.000216		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.00032	0.00032		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.00014	0.00014		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000223	0.000223		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	-0.000026	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700162	Cal Blank	ICPMS-200.8-W	SAMP		2/14/2018 4:04:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		887047.81	887047.81		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700163	0.5 ppb std	ICPMS-200.8-W	SAMP		2/14/2018 4:06:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		870885.19	870885.19		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700164	10 ppb std	ICPMS-200.8-W	SAMP		2/14/2018 4:09:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		876415.5	876415.5		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700165	50 ppb std	ICPMS-200.8-W	SAMP		2/14/2018 4:12:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		876418.5	876418.5		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700166	100 ppb std	ICPMS-200.8-W	SAMP		2/14/2018 4:14:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		860531.88	860531.88		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700167	100 ppb Br std	ICPMS-200.8-W	SAMP		2/14/2018 4:17:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Scandium	A		861244.5	861244.5		0	0	0	0.00108	0.01		0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700168	QCS	ICPMS-200.8-W ICV			2/14/2018 4:20:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.266	0.266		0.25	0	0	0.0002849	0.1	4.5	106%	90	110	0%	
Antimony	A	mg/L	0.04996	0.04996		0.05	0	0	3.047E-05	0.05	18	100%	90	110	0%	
Arsenic	A	mg/L	0.04893	0.04893		0.05	0	0	6.629E-05	0.005	18	98%	90	110	0%	
Barium	A	mg/L	0.04901	0.04901		0.05	0	0	6.437E-05	0.1	18	98%	90	110	0%	
Beryllium	A	mg/L	0.02555	0.02555		0.025	0	0	8.97E-06	0.001	4.5	102%	90	110	0%	
Boron	A	mg/L	0.05201	0.05201		0.05	0	0	0.00141	0.1	4.5	104%	90	110	0%	
Cadmium	A	mg/L	0.02527	0.02527		0.025	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.05107	0.05107		0.05	0	0	2.257E-05	0.001	4.5	102%	90	110	0%	
Chromium	A	mg/L	0.04956	0.04956		0.05	0	0	5.576E-05	0.01	18	99%	90	110	0%	
Cobalt	A	mg/L	0.04964	0.04964		0.05	0	0	3.904E-05	0.01	18	99%	90	110	0%	
Copper	A	mg/L	0.05089	0.05089		0.05	0	0	7.681E-05	0.01	4.5	102%	90	110	0%	
Iron	A	mg/L	0.2475	0.2475		0.25	0	0	0.000175	0.02	4.5	99%	90	110	0%	
Lanthanum	A	mg/L	0.05033	0.05033		0.05	0	0	0.0000111	0.001	4.5	101%	90	110	0%	
Lead	A	mg/L	0.05021	0.05021		0.05	0	0	2.956E-05	0.01	18	100%	90	110	0%	
Manganese	A	mg/L	0.254	0.254		0.25	0	0	3.649E-05	0.01	18	102%	90	110	0%	
Mercury	A	mg/L	0.002089	0.002089		0.002	0	0	1.289E-05	0.001	0.36	104%	90	110	0%	
Molybdenum	A	mg/L	0.04766	0.04766		0.05	0	0	2.302E-05	0.005	9	95%	90	110	0%	
Nickel	A	mg/L	0.05041	0.05041		0.05	0	0	7.128E-05	0.01	4.5	101%	90	110	0%	
Selenium	A	mg/L	0.05128	0.05128		0.05	0	0	0.0001532	0.005	18	103%	90	110	0%	
Silver	A	mg/L	0.02607	0.02607		0.025	0	0	2.959E-05	0.005	1.8	104%	90	110	0%	
Strontium	A	mg/L	0.04931	0.04931		0.05	0	0	1.229E-05	0.1	18	99%	90	110	0%	
Thallium	A	mg/L	0.04883	0.04883		0.05	0	0	1.434E-05	0.1	18	98%	90	110	0%	
Thorium	A	mg/L	0.0214	0.0214		0.02	0	0	5.767E-05	0.001	4.5	107%	90	110	0%	
Thorium 232	A	mg/L	0.0214	0.0214		0.02	0	0	5.767E-05	0.01	4.5	107%	90	110	0%	
Tin	A	mg/L	0.05016	0.05016		0.05	0	0	5.199E-05	0.1	9	100%	90	110	0%	
Titanium	A	mg/L	0.04682	0.04682		0.05	0	0	0.0001736	0.01	18	94%	90	110	0%	
Uranium	A	mg/L	0.01978	0.01978		0.02	0	0	1.332E-05	0.001	4.5	99%	90	110	0%	
Vanadium	A	mg/L	0.04848	0.04848		0.05	0	0	7.351E-05	0.1	18	97%	90	110	0%	
Zinc	A	mg/L	0.05165	0.05165		0.05	0	0	0.0002495	0.01	4.5	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700169	CCV	ICPMS-200.8-W CCV			2/14/2018 4:22:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700169	CCV	ICPMS-200.8-W	CCV		2/14/2018 4:22:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04908	0.04908		0.05	0	0	0.0002849	0.1	4.5	98%	90	110	0%	
Antimony	A	mg/L	0.0501	0.0501		0.05	0	0	3.047E-05	0.05	18	100%	90	110	0%	
Arsenic	A	mg/L	0.0506	0.0506		0.05	0	0	6.629E-05	0.005	18	101%	90	110	0%	
Barium	A	mg/L	0.0493	0.0493		0.05	0	0	6.437E-05	0.1	18	99%	90	110	0%	
Beryllium	A	mg/L	0.05057	0.05057		0.05	0	0	8.97E-06	0.001	4.5	101%	90	110	0%	
Boron	A	mg/L	0.05018	0.05018		0.05	0	0	0.00141	0.1	4.5	100%	90	110	0%	
Cadmium	A	mg/L	0.05084	0.05084		0.05	0	0	1.468E-05	0.001	18	102%	90	110	0%	
Cerium	A	mg/L	0.05079	0.05079		0.05	0	0	2.257E-05	0.001	4.5	102%	90	110	0%	
Chromium	A	mg/L	0.05057	0.05057		0.05	0	0	5.576E-05	0.01	18	101%	90	110	0%	
Cobalt	A	mg/L	0.051	0.051		0.05	0	0	3.904E-05	0.01	18	102%	90	110	0%	
Copper	A	mg/L	0.05149	0.05149		0.05	0	0	7.681E-05	0.01	4.5	103%	90	110	0%	
Iron	A	mg/L	1.329	1.329		1.3	0	0	0.000175	0.02	4.5	102%	90	110	0%	
Lanthanum	A	mg/L	0.05046	0.05046		0.05	0	0	0.0000111	0.001	4.5	101%	90	110	0%	
Lead	A	mg/L	0.05051	0.05051		0.05	0	0	2.956E-05	0.01	18	101%	90	110	0%	
Manganese	A	mg/L	0.05007	0.05007		0.05	0	0	3.649E-05	0.01	18	100%	90	110	0%	
Mercury	A	mg/L	0.001147	0.001147		0.001	0	0	1.289E-05	0.001	0.36	115%	90	110	0%	S
Molybdenum	A	mg/L	0.0519	0.0519		0.05	0	0	2.302E-05	0.005	9	104%	90	110	0%	
Nickel	A	mg/L	0.05084	0.05084		0.05	0	0	7.128E-05	0.01	4.5	102%	90	110	0%	
Selenium	A	mg/L	0.05112	0.05112		0.05	0	0	0.0001532	0.005	18	102%	90	110	0%	
Silver	A	mg/L	0.02077	0.02077		0.02	0	0	2.959E-05	0.005	1.8	104%	90	110	0%	
Strontium	A	mg/L	0.05057	0.05057		0.05	0	0	1.229E-05	0.1	18	101%	90	110	0%	
Thallium	A	mg/L	0.04941	0.04941		0.05	0	0	1.434E-05	0.1	18	99%	90	110	0%	
Thorium	A	mg/L	0.04773	0.04773		0.05	0	0	5.767E-05	0.001	4.5	95%	90	110	0%	
Thorium 232	A	mg/L	0.04773	0.04773		0.05	0	0	5.767E-05	0.01	4.5	95%	90	110	0%	
Tin	A	mg/L	0.05162	0.05162		0.05	0	0	5.199E-05	0.1	9	103%	90	110	0%	
Titanium	A	mg/L	0.04992	0.04992		0.05	0	0	0.0001736	0.01	18	100%	90	110	0%	
Uranium	A	mg/L	0.04973	0.04973		0.05	0	0	1.332E-05	0.001	4.5	99%	90	110	0%	
Vanadium	A	mg/L	0.04995	0.04995		0.05	0	0	7.351E-05	0.1	18	100%	90	110	0%	
Zinc	A	mg/L	0.0517	0.0517		0.05	0	0	0.0002495	0.01	4.5	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700170	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 4:25:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700170	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 4:25:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.00011	0.00011		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	-0.000056	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00004	0.00004		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000008	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000089	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.00002	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000093	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000116	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.006821	0.006821		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.000086	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000128	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Molybdenum	A	mg/L	0.000376	0.000376		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	-0.000072	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000073	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000151	0.000151		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	-0.00008	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000264	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000382	0.000382		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000382	0.000382		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000987	0.000987		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000042	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000081	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.00012	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.00016	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700171	CCB	ICPMS-200.8-W	CCB		2/14/2018 4:28:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.004129	-0.004129		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000034	-0.000034		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000114	-0.000114		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.001716	-0.001716		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000027	-0.000027		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.000827	-0.000827		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700171	CCB	ICPMS-200.8-W	CCB		2/14/2018 4:28:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium	A	mg/L	-0.000034	-0.000034		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000121	-0.000121		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000107	-0.000107		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000125	-0.000125		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000093	-0.000093		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	-0.001474	-0.001474		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	-0.000125	-0.000125		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000211	-0.000211		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000761	-0.000761		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000009	0.000009		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000037	0.000037		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000133	-0.000133		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000173	-0.000173		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000001	-0.000001		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000126	-0.000126		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000358	-0.000358		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000078	0.000078		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000078	0.000078		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000383	0.000383		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000136	-0.000136		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000121	-0.000121		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000114	-0.000114		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000083	-0.000083		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700172	B18020068-015	6010.20-SPLP	SAMP		2/14/2018 4:44:0	1	118411	2/12/2018 8:	0	0	18.13

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/L	0.000197	0.000394		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	J
Arsenic	B	mg/L	0.000026	0		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Beryllium	B	mg/L	0.000116	0.000232		0	0	0	0.0000298	0.001	5	0%	0	0	0%	J
Cadmium	B	mg/L	-0.000112	0		0	0	0	0.0001091	0.001	5	0%	0	0	0%	
Chromium	B	mg/L	0.003696	0.007392		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.000328	0.000656		0	0	0	0.0001741	0.005	5	0%	0	0	0%	J
Copper	B	mg/L	0.001333	0.002666		0	0	0	0.0003054	0.005	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700172	B18020068-015	6010.20-SPLP	SAMP		2/14/2018 4:44:0	1	118411	2/12/2018 8:	0	0	18.13

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	B	mg/L	0.000812	0.001624		0	0	0	8.548E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.001607	0.003214		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	J
Silver	B	mg/L	0.000699	0.001398		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	
Strontium	B	mg/L	0.1042	0.2084		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.00249	0.00498		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.03922	0.07844		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.004025	0.00805		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.004206	0.008412		0	0	0	0.0014006	0.01	5	0%	0	0	0%	J
Zinc	B	mg/L	0.005511	0.011022		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700173	B18020068-018	6010.20-SPLP	SAMP		2/14/2018 4:46:0	1	118411	2/12/2018 8:	0	0	15.08

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	B	mg/L	0.000833	0.001666		0	0	0	4.068E-05	0.001	5	0%	0	0	0%	
Arsenic	B	mg/L	0.003452	0.006904		0	0	0	0.000553	0.001	5	0%	0	0	0%	
Cadmium	B	mg/L	0.000122	0.000244		0	0	0	0.0001091	0.001	5	0%	0	0	0%	J
Chromium	B	mg/L	0.02718	0.05436		0	0	0	0.0004384	0.005	5	0%	0	0	0%	
Cobalt	B	mg/L	0.006441	0.012882		0	0	0	0.0001741	0.005	5	0%	0	0	0%	
Copper	B	mg/L	0.01966	0.03932		0	0	0	0.0003054	0.005	5	0%	0	0	0%	
Lead	B	mg/L	0.01384	0.02768		0	0	0	5.232E-05	0.001	5	0%	0	0	0%	
Nickel	B	mg/L	0.0124	0.0248		0	0	0	9.454E-05	0.005	5	0%	0	0	0%	
Silver	B	mg/L	0.000207	0.000414		0	0	0	0.0001425	0.001	0.25	0%	0	0	0%	J
Strontium	B	mg/L	0.2173	0.4346		0	0	0	2.936E-05	0.01	5	0%	0	0	0%	
Tin	B	mg/L	0.003073	0.006146		0	0	0	0.0004036	0.05	5	0%	0	0	0%	J
Titanium	B	mg/L	0.243	0.486		0	0	0	0.0004704	0.005	5	0%	0	0	0%	
Uranium	B	mg/L	0.003916	0.007832		0	0	0	3.644E-05	0.0003	5	0%	0	0	0%	
Vanadium	B	mg/L	0.0609	0.1218		0	0	0	0.0014006	0.01	5	0%	0	0	0%	
Zinc	B	mg/L	0.06119	0.12238		0	0	0	0.0008292	0.01	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700174	LCSD-118411	6010.20-SPLP	LCSD		2/14/2018 4:49:0	1	118411	2/12/2018 8:	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700174	LCSD-118411	6010.20-SPLP	LCSD		2/14/2018 4:49:0	1	118411	2/12/2018 8:	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.918	2.918		2.5	0.05117	2.719	0.002004	0.03	5	115%	80	120	7%	
Antimony	A	mg/L	0.5163	0.5163		0.5	0.000504	0.4964	2.034E-05	0.001	5	103%	80	120	4%	
Arsenic	A	mg/L	0.4782	0.4782		0.5	0	0.4815	0.0002765	0.001	5	96%	80	120	1%	
Barium	A	mg/L	5.611	5.611		5.5	0.009693	5.307	0.0000743	0.05	5	102%	80	120	6%	
Beryllium	A	mg/L	0.2333	0.2333		0.25	0	0.2284	0.0000149	0.001	5	93%	80	120	2%	
Boron	A	mg/L	0.5809	0.5809		0.5	0.06271	0.5588	0.00105	0.05	5	104%	80	120	4%	
Cadmium	A	mg/L	0.2366	0.2366		0.25	0	0.234	5.453E-05	0.001	5	95%	80	120	1%	
Chromium	A	mg/L	0.5132	0.5132		0.5	0.001808	0.531	0.0002192	0.005	5	102%	80	120	3%	
Cobalt	A	mg/L	0.5132	0.5132		0.5	0	0.524	8.706E-05	0.005	5	103%	80	120	2%	
Copper	A	mg/L	0.5071	0.5071		0.5	0	0.5052	0.0001527	0.005	5	101%	80	120	0%	
Lead	A	mg/L	0.5342	0.5342		0.5	0.000484	0.509	2.616E-05	0.001	5	107%	80	120	5%	
Manganese	A	mg/L	2.556	2.556		2.5	0.000524	2.612	8.486E-05	0.001	5	102%	80	120	2%	
Molybdenum	A	mg/L	0.543	0.543		0.5	0.000803	0.5349	4.274E-05	0.001	5	108%	80	120	2%	
Nickel	A	mg/L	0.5049	0.5049		0.5	0.000846	0.5194	4.727E-05	0.005	5	101%	80	120	3%	
Selenium	A	mg/L	0.402	0.402		0.5	0	0.397	0.0002549	0.001	5	80%	80	120	1%	
Silver	A	mg/L	0.2525	0.2525		0.25	0.000559	0.2589	7.125E-05	0.001	0.25	101%	80	120	3%	
Strontium	A	mg/L	0.5372	0.5372		0.5	0.001654	0.5284	1.468E-05	0.01	5	107%	80	120	2%	
Thallium	A	mg/L	0.5059	0.5059		0.5	0.00094	0.4985	2.645E-05	0.0005	5	101%	80	120	1%	
Tin	A	mg/L	0.5645	0.5645		0.5	0.002257	0.5557	0.0002018	0.05	5	112%	80	120	2%	
Titanium	A	mg/L	0.5189	0.5189		0.5	0.001484	0.5678	0.0002352	0.005	5	103%	80	120	9%	
Uranium	A	mg/L	0.5701	0.5701		0.5	0.000035	0.5317	1.822E-05	0.0003	5	114%	80	120	7%	
Vanadium	A	mg/L	0.5272	0.5272		0.5	0	0.552	0.0007003	0.01	5	105%	80	120	5%	
Zinc	A	mg/L	0.4548	0.4548		0.5	0.001843	0.4477	0.0004146	0.01	5	91%	80	120	2%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700175	B18020068-001	6010.20-SPLP	MS3		2/14/2018 4:51:0	1	118411	2/12/2018 8:	1E+07	0	8.11

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	29.46	58.92		5	37.34	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.4707	0.9414		1	0.001226	0	4.068E-05	0.001	5	94%	75	125	0%	
Arsenic	A	mg/L	0.4763	0.9526		1	0.008394	0	0.000553	0.001	5	94%	75	125	0%	
Barium	A	mg/L	5.806	11.612		11	0.13976	0	0.0001486	0.05	5	104%	75	125	0%	
Beryllium	A	mg/L	0.213	0.426		0.5	0.001388	0	0.0000298	0.001	5	85%	75	125	0%	
Boron	A	mg/L	0.6431	1.2862		1	0.3322	0	0.0021	0.05	5	95%	75	125	0%	
Cadmium	A	mg/L	0.2406	0.4812		0.5	0	0	0.0001091	0.001	5	96%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700175	B18020068-001	6010.20-SPLP	MS3		2/14/2018 4:51:0	1	118411	2/12/2018 8:	1E+07	0	8.11

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.519	1.038		1	0.03284	0	0.0004384	0.005	5	101%	75	125	0%	
Cobalt	A	mg/L	0.5168	1.0336		1	0.008188	0	0.0001741	0.005	5	103%	75	125	0%	
Copper	A	mg/L	0.5092	1.0184		1	0.013646	0	0.0003054	0.005	5	100%	75	125	0%	
Lead	A	mg/L	0.53	1.06		1	0.019176	0	5.232E-05	0.001	5	104%	75	125	0%	
Manganese	A	mg/L	2.595	5.19		5	0.1775	0	0.0001697	0.001	5	100%	75	125	0%	
Molybdenum	A	mg/L	0.5415	1.083		1	0.008348	0	8.548E-05	0.001	5	107%	75	125	0%	
Nickel	A	mg/L	0.5103	1.0206		1	0.017528	0	9.454E-05	0.005	5	100%	75	125	0%	
Selenium	A	mg/L	0.3975	0.795		1	0	0	0.0005098	0.001	5	80%	75	125	0%	
Silver	A	mg/L	0.2612	0.5224		0.5	0.00042	0	0.0001425	0.001	0.25	104%	75	125	0%	
Strontium	A	mg/L	0.5985	1.197		1	0.13016	0	2.936E-05	0.01	5	107%	75	125	0%	
Thallium	A	mg/L	0.4997	0.9994		1	0.000952	0	0.0000529	0.0005	5	100%	75	125	0%	
Tin	A	mg/L	0.56	1.12		1	0.005188	0	0.0004036	0.05	5	111%	75	125	0%	
Titanium	A	mg/L	0.703	1.406		1	0.344	0	0.0004704	0.005	5	106%	75	125	0%	
Uranium	A	mg/L	0.5638	1.1276		1	0.008704	0	3.644E-05	0.0003	5	112%	75	125	0%	
Vanadium	A	mg/L	0.5489	1.0978		1	0.06744	0	0.0014006	0.01	5	103%	75	125	0%	
Zinc	A	mg/L	0.4961	0.9922		1	0.073	0	0.0008292	0.01	5	92%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700176	B18020068-002	6010.20-SPLP	MS3		2/14/2018 4:54:0	1	118411	2/12/2018 8:	1E+07	0	23.57

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	7.68	15.36		5	7.578	0	0.004008	0.03	5	156%	75	125	0%	S
Antimony	A	mg/L	0.497	0.994		1	0.000606	0	4.068E-05	0.001	5	99%	75	125	0%	
Arsenic	A	mg/L	0.4833	0.9666		1	0	0	0.000553	0.001	5	97%	75	125	0%	
Barium	A	mg/L	5.811	11.622		11	0.05828	0	0.0001486	0.05	5	105%	75	125	0%	
Beryllium	A	mg/L	0.2188	0.4376		0.5	0.000132	0	0.0000298	0.001	5	87%	75	125	0%	
Boron	A	mg/L	0.6109	1.2218		1	0.2504	0	0.0021	0.05	5	97%	75	125	0%	
Cadmium	A	mg/L	0.2304	0.4608		0.5	0	0	0.0001091	0.001	5	92%	75	125	0%	
Chromium	A	mg/L	0.4903	0.9806		1	0.010586	0	0.0004384	0.005	5	97%	75	125	0%	
Cobalt	A	mg/L	0.497	0.994		1	0.000846	0	0.0001741	0.005	5	99%	75	125	0%	
Copper	A	mg/L	0.5074	1.0148		1	0.003504	0	0.0003054	0.005	5	101%	75	125	0%	
Lead	A	mg/L	0.5182	1.0364		1	0.002602	0	5.232E-05	0.001	5	103%	75	125	0%	
Manganese	A	mg/L	2.657	5.314		5	0.02804	0	0.0001697	0.001	5	106%	75	125	0%	
Molybdenum	A	mg/L	0.5223	1.0446		1	0.00464	0	8.548E-05	0.001	5	104%	75	125	0%	
Nickel	A	mg/L	0.4981	0.9962		1	0.004762	0	9.454E-05	0.005	5	99%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700176	B18020068-002	6010.20-SPLP	MS3		2/14/2018 4:54:0	1	118411	2/12/2018 8:	1E+07	0	23.57

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	0.411	0.822		1	0.000708	0	0.0005098	0.001	5	82%	75	125	0%	
Silver	A	mg/L	0.2473	0.4946		0.5	0	0	0.0001425	0.001	0.25	99%	75	125	0%	
Strontium	A	mg/L	0.5964	1.1928		1	0.15944	0	2.936E-05	0.01	5	103%	75	125	0%	
Thallium	A	mg/L	0.4922	0.9844		1	0.000312	0	0.0000529	0.0005	5	98%	75	125	0%	
Tin	A	mg/L	0.5428	1.0856		1	0.003016	0	0.0004036	0.05	5	108%	75	125	0%	
Titanium	A	mg/L	0.5625	1.125		1	0.09334	0	0.0004704	0.005	5	103%	75	125	0%	
Uranium	A	mg/L	0.5424	1.0848		1	0.008116	0	3.644E-05	0.0003	5	108%	75	125	0%	
Vanadium	A	mg/L	0.4982	0.9964		1	0.00899	0	0.0014006	0.01	5	99%	75	125	0%	
Zinc	A	mg/L	0.4439	0.8878		1	0.012894	0	0.0008292	0.01	5	87%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700177	B18020068-003	6010.20-SPLP	MS3		2/14/2018 4:56:0	1	118411	2/12/2018 8:	1E+07	0	14.9

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	53.7	107.4		5	66.9	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.4391	0.8782		1	0.001628	0	4.068E-05	0.001	5	88%	75	125	0%	
Arsenic	A	mg/L	0.4776	0.9552		1	0.004118	0	0.000553	0.001	5	95%	75	125	0%	
Barium	A	mg/L	5.955	11.91		11	0.4556	0	0.0001486	0.05	5	104%	75	125	0%	
Beryllium	A	mg/L	0.2131	0.4262		0.5	0.00248	0	0.0000298	0.001	5	85%	75	125	0%	
Boron	A	mg/L	0.6982	1.3964		1	0.4182	0	0.0021	0.05	5	98%	75	125	0%	
Cadmium	A	mg/L	0.233	0.466		0.5	0	0	0.0001091	0.001	5	93%	75	125	0%	
Chromium	A	mg/L	0.5171	1.0342		1	0.05674	0	0.0004384	0.005	5	98%	75	125	0%	
Cobalt	A	mg/L	0.529	1.058		1	0.012362	0	0.0001741	0.005	5	105%	75	125	0%	
Copper	A	mg/L	0.5136	1.0272		1	0.0354	0	0.0003054	0.005	5	99%	75	125	0%	
Lead	A	mg/L	0.5301	1.0602		1	0.02432	0	5.232E-05	0.001	5	104%	75	125	0%	
Manganese	A	mg/L	2.819	5.638		5	0.6424	0	0.0001697	0.001	5	100%	75	125	0%	
Molybdenum	A	mg/L	0.5081	1.0162		1	0.007174	0	8.548E-05	0.001	5	101%	75	125	0%	
Nickel	A	mg/L	0.5183	1.0366		1	0.02374	0	9.454E-05	0.005	5	101%	75	125	0%	
Selenium	A	mg/L	0.4087	0.8174		1	0.00071	0	0.0005098	0.001	5	82%	75	125	0%	
Silver	A	mg/L	0.2602	0.5204		0.5	0.000178	0	0.0001425	0.001	0.25	104%	75	125	0%	
Strontium	A	mg/L	0.7137	1.4274		1	0.3504	0	2.936E-05	0.01	5	108%	75	125	0%	
Thallium	A	mg/L	0.493	0.986		1	0.000686	0	0.0000529	0.0005	5	99%	75	125	0%	
Tin	A	mg/L	0.541	1.082		1	0.00554	0	0.0004036	0.05	5	108%	75	125	0%	
Titanium	A	mg/L	0.7386	1.4772		1	0.4784	0	0.0004704	0.005	5	100%	75	125	0%	
Uranium	A	mg/L	0.5669	1.1338		1	0.018286	0	3.644E-05	0.0003	5	112%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700177	B18020068-003	6010.20-SPLP	MS3		2/14/2018 4:56:0	1	118411	2/12/2018 8:	1E+07	0	14.9

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	0.579	1.158		1	0.14032	0	0.0014006	0.01	5	102%	75	125	0%	
Zinc	A	mg/L	0.5002	1.0004		1	0.11636	0	0.0008292	0.01	5	88%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700178	B18020068-004	6010.20-SPLP	MS3		2/14/2018 4:59:0	1	118411	2/12/2018 8:	1E+07	0	10.1

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	7.032	14.064		5	5.552	0	0.004008	0.03	5	170%	75	125	0%	S
Antimony	A	mg/L	0.5054	1.0108		1	0.000646	0	4.068E-05	0.001	5	101%	75	125	0%	
Arsenic	A	mg/L	0.4655	0.931		1	0.002524	0	0.000553	0.001	5	93%	75	125	0%	
Barium	A	mg/L	5.467	10.934		11	0.04614	0	0.0001486	0.05	5	99%	75	125	0%	
Beryllium	A	mg/L	0.2199	0.4398		0.5	0	0	0.0000298	0.001	5	88%	75	125	0%	
Boron	A	mg/L	0.6217	1.2434		1	0.24	0	0.0021	0.05	5	100%	75	125	0%	
Cadmium	A	mg/L	0.2267	0.4534		0.5	0	0	0.0001091	0.001	5	91%	75	125	0%	
Chromium	A	mg/L	0.4862	0.9724		1	0.00684	0	0.0004384	0.005	5	97%	75	125	0%	
Cobalt	A	mg/L	0.4836	0.9672		1	0.000438	0	0.0001741	0.005	5	97%	75	125	0%	
Copper	A	mg/L	0.4866	0.9732		1	0.002116	0	0.0003054	0.005	5	97%	75	125	0%	
Lead	A	mg/L	0.5101	1.0202		1	0.003244	0	5.232E-05	0.001	5	102%	75	125	0%	
Manganese	A	mg/L	2.409	4.818		5	0.016008	0	0.0001697	0.001	5	96%	75	125	0%	
Molybdenum	A	mg/L	0.4922	0.9844		1	0.002202	0	8.548E-05	0.001	5	98%	75	125	0%	
Nickel	A	mg/L	0.481	0.962		1	0.002264	0	9.454E-05	0.005	5	96%	75	125	0%	
Selenium	A	mg/L	0.3962	0.7924		1	0.000956	0	0.0005098	0.001	5	79%	75	125	0%	
Silver	A	mg/L	0.2566	0.5132		0.5	0	0	0.0001425	0.001	0.25	103%	75	125	0%	
Strontium	A	mg/L	0.5551	1.1102		1	0.06108	0	2.936E-05	0.01	5	105%	75	125	0%	
Thallium	A	mg/L	0.4815	0.963		1	0.000122	0	0.0000529	0.0005	5	96%	75	125	0%	
Tin	A	mg/L	0.5578	1.1156		1	0.00271	0	0.0004036	0.05	5	111%	75	125	0%	
Titanium	A	mg/L	0.5172	1.0344		1	0.0687	0	0.0004704	0.005	5	97%	75	125	0%	
Uranium	A	mg/L	0.5586	1.1172		1	0.002198	0	3.644E-05	0.0003	5	112%	75	125	0%	
Vanadium	A	mg/L	0.4854	0.9708		1	0.010462	0	0.0014006	0.01	5	96%	75	125	0%	
Zinc	A	mg/L	0.4463	0.8926		1	0.011634	0	0.0008292	0.01	5	88%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700179	B18020068-005	6010.20-SPLP	MS3		2/14/2018 5:01:0	1	118411	2/12/2018 8:	1E+07	0	1.42

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	20.33	40.66		5	25.62	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.499	0.998		1	0.001128	0	4.068E-05	0.001	5	100%	75	125	0%	
Arsenic	A	mg/L	0.4789	0.9578		1	0.01741	0	0.000553	0.001	5	94%	75	125	0%	
Barium	A	mg/L	6.192	12.384		11	0.9268	0	0.0001486	0.05	5	104%	75	125	0%	
Beryllium	A	mg/L	0.2199	0.4398		0.5	0.001162	0	0.0000298	0.001	5	88%	75	125	0%	
Boron	A	mg/L	0.6379	1.2758		1	0.2852	0	0.0021	0.05	5	99%	75	125	0%	
Cadmium	A	mg/L	0.23	0.46		0.5	0	0	0.0001091	0.001	5	92%	75	125	0%	
Chromium	A	mg/L	0.4895	0.979		1	0.019662	0	0.0004384	0.005	5	96%	75	125	0%	
Cobalt	A	mg/L	0.4986	0.9972		1	0.012236	0	0.0001741	0.005	5	98%	75	125	0%	
Copper	A	mg/L	0.4944	0.9888		1	0.01169	0	0.0003054	0.005	5	98%	75	125	0%	
Lead	A	mg/L	0.529	1.058		1	0.016778	0	5.232E-05	0.001	5	104%	75	125	0%	
Manganese	A	mg/L	3.213	6.426		5	1.62	0	0.0001697	0.001	5	96%	75	125	0%	
Molybdenum	A	mg/L	0.5168	1.0336		1	0.004768	0	8.548E-05	0.001	5	103%	75	125	0%	
Nickel	A	mg/L	0.4874	0.9748		1	0.016394	0	9.454E-05	0.005	5	96%	75	125	0%	
Selenium	A	mg/L	0.3989	0.7978		1	0	0	0.0005098	0.001	5	80%	75	125	0%	
Silver	A	mg/L	0.2514	0.5028		0.5	0	0	0.0001425	0.001	0.25	101%	75	125	0%	
Strontium	A	mg/L	0.587	1.174		1	0.13914	0	2.936E-05	0.01	5	103%	75	125	0%	
Thallium	A	mg/L	0.4981	0.9962		1	0.00032	0	0.0000529	0.0005	5	100%	75	125	0%	
Tin	A	mg/L	0.5495	1.099		1	0.003236	0	0.0004036	0.05	5	110%	75	125	0%	
Titanium	A	mg/L	0.6551	1.3102		1	0.3246	0	0.0004704	0.005	5	99%	75	125	0%	
Uranium	A	mg/L	0.5601	1.1202		1	0.002728	0	3.644E-05	0.0003	5	112%	75	125	0%	
Vanadium	A	mg/L	0.5362	1.0724		1	0.0747	0	0.0014006	0.01	5	100%	75	125	0%	
Zinc	A	mg/L	0.4692	0.9384		1	0.06106	0	0.0008292	0.01	5	88%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700180	B18020068-006	6010.20-SPLP	MS3		2/14/2018 5:03:0	1	118411	2/12/2018 8:	1E+07	0	6.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	59.69	119.38		5	79.32	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.434	0.868		1	0.001098	0	4.068E-05	0.001	5	87%	75	125	0%	
Arsenic	A	mg/L	0.4836	0.9672		1	0.011352	0	0.000553	0.001	5	96%	75	125	0%	
Barium	A	mg/L	5.971	11.942		11	0.479	0	0.0001486	0.05	5	104%	75	125	0%	
Beryllium	A	mg/L	0.2045	0.409		0.5	0.002174	0	0.0000298	0.001	5	81%	75	125	0%	
Boron	A	mg/L	0.7313	1.4626		1	0.5422	0	0.0021	0.05	5	92%	75	125	0%	
Cadmium	A	mg/L	0.236	0.472		0.5	0	0	0.0001091	0.001	5	94%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700180	B18020068-006	6010.20-SPLP	MS3		2/14/2018 5:03:0	1	118411	2/12/2018 8:	1E+07	0	6.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.536	1.072		1	0.10766	0	0.0004384	0.005	5	96%	75	125	0%	
Cobalt	A	mg/L	0.5093	1.0186		1	0.012682	0	0.0001741	0.005	5	101%	75	125	0%	
Copper	A	mg/L	0.5037	1.0074		1	0.02274	0	0.0003054	0.005	5	98%	75	125	0%	
Lead	A	mg/L	0.5137	1.0274		1	0.02002	0	5.232E-05	0.001	5	101%	75	125	0%	
Manganese	A	mg/L	2.602	5.204		5	0.3316	0	0.0001697	0.001	5	97%	75	125	0%	
Molybdenum	A	mg/L	0.508	1.016		1	0.004072	0	8.548E-05	0.001	5	101%	75	125	0%	
Nickel	A	mg/L	0.5047	1.0094		1	0.02856	0	9.454E-05	0.005	5	98%	75	125	0%	
Selenium	A	mg/L	0.406	0.812		1	0.0036	0	0.0005098	0.001	5	81%	75	125	0%	
Silver	A	mg/L	0.2663	0.5326		0.5	0	0	0.0001425	0.001	0.25	107%	75	125	0%	
Strontium	A	mg/L	0.7077	1.4154		1	0.3088	0	2.936E-05	0.01	5	111%	75	125	0%	
Thallium	A	mg/L	0.4872	0.9744		1	0.00075	0	0.0000529	0.0005	5	97%	75	125	0%	
Tin	A	mg/L	0.567	1.134		1	0.005604	0	0.0004036	0.05	5	113%	75	125	0%	
Titanium	A	mg/L	0.7715	1.543		1	0.4318	0	0.0004704	0.005	5	111%	75	125	0%	
Uranium	A	mg/L	0.5604	1.1208		1	0.012246	0	3.644E-05	0.0003	5	111%	75	125	0%	
Vanadium	A	mg/L	0.5641	1.1282		1	0.10958	0	0.0014006	0.01	5	102%	75	125	0%	
Zinc	A	mg/L	0.4957	0.9914		1	0.11574	0	0.0008292	0.01	5	88%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700181	B18020068-007	6010.20-SPLP	MS3		2/14/2018 5:06:0	1	118411	2/12/2018 8:	1E+07	0	14.4

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	55.26	110.52		5	85.5	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.4485	0.897		1	0.000916	0	4.068E-05	0.001	5	90%	75	125	0%	
Arsenic	A	mg/L	0.4735	0.947		1	0.01605	0	0.000553	0.001	5	93%	75	125	0%	
Barium	A	mg/L	6.204	12.408		11	0.6142	0	0.0001486	0.05	5	107%	75	125	0%	
Beryllium	A	mg/L	0.2053	0.4106		0.5	0.002542	0	0.0000298	0.001	5	82%	75	125	0%	
Boron	A	mg/L	0.6759	1.3518		1	0.435	0	0.0021	0.05	5	92%	75	125	0%	
Cadmium	A	mg/L	0.2347	0.4694		0.5	0	0	0.0001091	0.001	5	94%	75	125	0%	
Chromium	A	mg/L	0.5107	1.0214		1	0.06186	0	0.0004384	0.005	5	96%	75	125	0%	
Cobalt	A	mg/L	0.5127	1.0254		1	0.012836	0	0.0001741	0.005	5	101%	75	125	0%	
Copper	A	mg/L	0.4943	0.9886		1	0.02276	0	0.0003054	0.005	5	97%	75	125	0%	
Lead	A	mg/L	0.5357	1.0714		1	0.02472	0	5.232E-05	0.001	5	105%	75	125	0%	
Manganese	A	mg/L	2.848	5.696		5	0.7598	0	0.0001697	0.001	5	99%	75	125	0%	
Molybdenum	A	mg/L	0.5146	1.0292		1	0.00503	0	8.548E-05	0.001	5	102%	75	125	0%	
Nickel	A	mg/L	0.5032	1.0064		1	0.02884	0	9.454E-05	0.005	5	98%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700181	B18020068-007	6010.20-SPLP	MS3		2/14/2018 5:06:0	1	118411	2/12/2018 8:	1E+07	0	14.4

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	0.4032	0.8064		1	0.00166	0	0.0005098	0.001	5	80%	75	125	0%	
Silver	A	mg/L	0.2605	0.521		0.5	0	0	0.0001425	0.001	0.25	104%	75	125	0%	
Strontium	A	mg/L	0.7847	1.5694		1	0.5198	0	2.936E-05	0.01	5	105%	75	125	0%	
Thallium	A	mg/L	0.5011	1.0022		1	0.000518	0	0.0000529	0.0005	5	100%	75	125	0%	
Tin	A	mg/L	0.5621	1.1242		1	0.004646	0	0.0004036	0.05	5	112%	75	125	0%	
Titanium	A	mg/L	0.7415	1.483		1	0.4962	0	0.0004704	0.005	5	99%	75	125	0%	
Uranium	A	mg/L	0.5689	1.1378		1	0.011196	0	3.644E-05	0.0003	5	113%	75	125	0%	
Vanadium	A	mg/L	0.5401	1.0802		1	0.1103	0	0.0014006	0.01	5	97%	75	125	0%	
Zinc	A	mg/L	0.4841	0.9682		1	0.10856	0	0.0008292	0.01	5	86%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700182	CCV	ICPMS-200.8-W CCV			2/14/2018 5:08:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.1688	0.1688		0.05	0	0	0.0002849	0.1	4.5	338%	90	110	0%	S
Antimony	A	mg/L	0.05082	0.05082		0.05	0	0	3.047E-05	0.05	18	102%	90	110	0%	
Arsenic	A	mg/L	0.05116	0.05116		0.05	0	0	6.629E-05	0.005	18	102%	90	110	0%	
Barium	A	mg/L	0.06368	0.06368		0.05	0	0	6.437E-05	0.1	18	127%	90	110	0%	S
Beryllium	A	mg/L	0.0497	0.0497		0.05	0	0	8.97E-06	0.001	4.5	99%	90	110	0%	
Boron	A	mg/L	0.06375	0.06375		0.05	0	0	0.00141	0.1	4.5	127%	90	110	0%	S
Cadmium	A	mg/L	0.05006	0.05006		0.05	0	0	1.468E-05	0.001	18	100%	90	110	0%	
Cerium	A	mg/L	0.05127	0.05127		0.05	0	0	2.257E-05	0.001	4.5	103%	90	110	0%	
Chromium	A	mg/L	0.0499	0.0499		0.05	0	0	5.576E-05	0.01	18	100%	90	110	0%	
Cobalt	A	mg/L	0.05049	0.05049		0.05	0	0	3.904E-05	0.01	18	101%	90	110	0%	
Copper	A	mg/L	0.05191	0.05191		0.05	0	0	7.681E-05	0.01	4.5	104%	90	110	0%	
Iron	A	mg/L	1.334	1.334		1.3	0	0	0.000175	0.02	4.5	103%	90	110	0%	
Lanthanum	A	mg/L	0.05128	0.05128		0.05	0	0	0.0000111	0.001	4.5	103%	90	110	0%	
Lead	A	mg/L	0.0529	0.0529		0.05	0	0	2.956E-05	0.01	18	106%	90	110	0%	
Manganese	A	mg/L	0.0556	0.0556		0.05	0	0	3.649E-05	0.01	18	111%	90	110	0%	S
Mercury	A	mg/L	0.001087	0.001087		0.001	0	0	1.289E-05	0.001	0.36	109%	90	110	0%	
Molybdenum	A	mg/L	0.04955	0.04955		0.05	0	0	2.302E-05	0.005	9	99%	90	110	0%	
Nickel	A	mg/L	0.05036	0.05036		0.05	0	0	7.128E-05	0.01	4.5	101%	90	110	0%	
Selenium	A	mg/L	0.05138	0.05138		0.05	0	0	0.0001532	0.005	18	103%	90	110	0%	
Silver	A	mg/L	0.01976	0.01976		0.02	0	0	2.959E-05	0.005	1.8	99%	90	110	0%	
Strontium	A	mg/L	0.05213	0.05213		0.05	0	0	1.229E-05	0.1	18	104%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700182	CCV	ICPMS-200.8-W CCV			2/14/2018 5:08:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.05116	0.05116		0.05	0	0	1.434E-05	0.1	18	102%	90	110	0%	
Thorium	A	mg/L	0.04824	0.04824		0.05	0	0	5.767E-05	0.001	4.5	96%	90	110	0%	
Thorium 232	A	mg/L	0.04824	0.04824		0.05	0	0	5.767E-05	0.01	4.5	96%	90	110	0%	
Tin	A	mg/L	0.05066	0.05066		0.05	0	0	5.199E-05	0.1	9	101%	90	110	0%	
Titanium	A	mg/L	0.05054	0.05054		0.05	0	0	0.0001736	0.01	18	101%	90	110	0%	
Uranium	A	mg/L	0.05265	0.05265		0.05	0	0	1.332E-05	0.001	4.5	105%	90	110	0%	
Vanadium	A	mg/L	0.05057	0.05057		0.05	0	0	7.351E-05	0.1	18	101%	90	110	0%	
Zinc	A	mg/L	0.05285	0.05285		0.05	0	0	0.0002495	0.01	4.5	106%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700183	Rinse	ICPMS-200.8-W SAMP			2/14/2018 5:11:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.00066	0.00066		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000589	0.000589		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000244	0.000244		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000232	0.000232		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000545	0.000545		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000538	0.000538		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000469	0.000469		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000519	0.000519		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000499	0.000499		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000759	0.000759		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000011	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000858	0.000858		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.00048	0.00048		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000339	0.000339		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000396	0.000396		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.00067	0.00067		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000108	0.000108		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000923	0.000923		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000923	0.000923		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.001226	0.001226		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000948	0.000948		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000527	0.000527		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700183	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 5:11:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	0.00051	0.00051		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000515	0.000515		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700184	CCB	ICPMS-200.8-W	CCB		2/14/2018 5:14:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.02998	0.02998		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000318	0.000318		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000329	0.000329		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.002834	0.002834		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000152	0.000152		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.008375	0.008375		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000118	0.000118		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000246	0.000246		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000255	0.000255		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	0.000252	0.000252		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000284	0.000284		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.01435	0.01435		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000246	0.000246		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000315	0.000315		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.001326	0.001326		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000009	0.000009		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000371	0.000371		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000208	0.000208		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000015	0.000015		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000167	0.000167		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000369	0.000369		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000067	-0.000067		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000419	0.000419		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000419	0.000419		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000477	0.000477		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000262	0.000262		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000249	0.000249		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000255	0.000255		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700184	CCB	ICPMS-200.8-W	CCB		2/14/2018 5:14:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/L	0.0003	0.0003		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700185	B18020068-008	6010.20-SPLP	MS3		2/14/2018 5:16:0	1	118411	2/12/2018 8:	1E+07	0	0.84

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	12.07	24.14		5	15.674	0	0.004008	0.03	5	169%	75	125	0%	S
Antimony	A	mg/L	0.5169	1.0338		1	0.0007	0	4.068E-05	0.001	5	103%	75	125	0%	
Arsenic	A	mg/L	0.4722	0.9444		1	0.004678	0	0.000553	0.001	5	94%	75	125	0%	
Barium	A	mg/L	5.787	11.574		11	0.15816	0	0.0001486	0.05	5	104%	75	125	0%	
Beryllium	A	mg/L	0.223	0.446		0.5	0.000352	0	0.0000298	0.001	5	89%	75	125	0%	
Boron	A	mg/L	0.6134	1.2268		1	0.26	0	0.0021	0.05	5	97%	75	125	0%	
Cadmium	A	mg/L	0.2361	0.4722		0.5	0	0	0.0001091	0.001	5	94%	75	125	0%	
Chromium	A	mg/L	0.4906	0.9812		1	0.016082	0	0.0004384	0.005	5	97%	75	125	0%	
Cobalt	A	mg/L	0.4906	0.9812		1	0.005224	0	0.0001741	0.005	5	98%	75	125	0%	
Copper	A	mg/L	0.4867	0.9734		1	0.006974	0	0.0003054	0.005	5	97%	75	125	0%	
Lead	A	mg/L	0.5185	1.037		1	0.008432	0	5.232E-05	0.001	5	103%	75	125	0%	
Manganese	A	mg/L	2.534	5.068		5	0.17532	0	0.0001697	0.001	5	98%	75	125	0%	
Molybdenum	A	mg/L	0.5034	1.0068		1	0.003428	0	8.548E-05	0.001	5	100%	75	125	0%	
Nickel	A	mg/L	0.4876	0.9752		1	0.009722	0	9.454E-05	0.005	5	97%	75	125	0%	
Selenium	A	mg/L	0.4002	0.8004		1	0	0	0.0005098	0.001	5	80%	75	125	0%	
Silver	A	mg/L	0.2591	0.5182		0.5	0	0	0.0001425	0.001	0.25	104%	75	125	0%	
Strontium	A	mg/L	0.5343	1.0686		1	0.04354	0	2.936E-05	0.01	5	103%	75	125	0%	
Thallium	A	mg/L	0.4848	0.9696		1	0.000136	0	0.0000529	0.0005	5	97%	75	125	0%	
Tin	A	mg/L	0.5691	1.1382		1	0.00287	0	0.0004036	0.05	5	114%	75	125	0%	
Titanium	A	mg/L	0.5561	1.1122		1	0.19148	0	0.0004704	0.005	5	92%	75	125	0%	
Uranium	A	mg/L	0.5415	1.083		1	0.000966	0	3.644E-05	0.0003	5	108%	75	125	0%	
Vanadium	A	mg/L	0.5014	1.0028		1	0.0334	0	0.0014006	0.01	5	97%	75	125	0%	
Zinc	A	mg/L	0.4439	0.8878		1	0.0284	0	0.0008292	0.01	5	86%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700186	B18020068-009	6010.20-SPLP	MS3		2/14/2018 5:19:0	1	118411	2/12/2018 8:	1E+07	0	3.91

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700186	B18020068-009	6010.20-SPLP	MS3		2/14/2018 5:19:0	1	118411	2/12/2018 8:	1E+07	0	3.91

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	53.94	107.88		5	79.64	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.4434	0.8868		1	0.001872	0	4.068E-05	0.001	5	88%	75	125	0%	
Arsenic	A	mg/L	0.4755	0.951		1	0.02102	0	0.000553	0.001	5	93%	75	125	0%	
Barium	A	mg/L	6.237	12.474		11	1.0974	0	0.0001486	0.05	5	103%	75	125	0%	
Beryllium	A	mg/L	0.2068	0.4136		0.5	0.002584	0	0.0000298	0.001	5	82%	75	125	0%	
Boron	A	mg/L	0.7037	1.4074		1	0.4636	0	0.0021	0.05	5	94%	75	125	0%	
Cadmium	A	mg/L	0.229	0.458		0.5	0.000328	0	0.0001091	0.001	5	92%	75	125	0%	
Chromium	A	mg/L	0.535	1.07		1	0.10214	0	0.0004384	0.005	5	97%	75	125	0%	
Cobalt	A	mg/L	0.4958	0.9916		1	0.03118	0	0.0001741	0.005	5	96%	75	125	0%	
Copper	A	mg/L	0.5023	1.0046		1	0.03496	0	0.0003054	0.005	5	97%	75	125	0%	
Lead	A	mg/L	0.5313	1.0626		1	0.03832	0	5.232E-05	0.001	5	102%	75	125	0%	
Manganese	A	mg/L	3.177	6.354		5	1.5014	0	0.0001697	0.001	5	97%	75	125	0%	
Molybdenum	A	mg/L	0.5076	1.0152		1	0.014312	0	8.548E-05	0.001	5	100%	75	125	0%	
Nickel	A	mg/L	0.4981	0.9962		1	0.04902	0	9.454E-05	0.005	5	95%	75	125	0%	
Selenium	A	mg/L	0.3919	0.7838		1	0.000584	0	0.0005098	0.001	5	78%	75	125	0%	
Silver	A	mg/L	0.2522	0.5044		0.5	0.000894	0	0.0001425	0.001	0.25	101%	75	125	0%	
Strontium	A	mg/L	0.7157	1.4314		1	0.3836	0	2.936E-05	0.01	5	105%	75	125	0%	
Thallium	A	mg/L	0.4822	0.9644		1	0.001366	0	0.0000529	0.0005	5	96%	75	125	0%	
Tin	A	mg/L	0.5578	1.1156		1	0.007134	0	0.0004036	0.05	5	111%	75	125	0%	
Titanium	A	mg/L	0.8889	1.7778		1	0.8698	0	0.0004704	0.005	5	91%	75	125	0%	
Uranium	A	mg/L	0.5751	1.1502		1	0.00672	0	3.644E-05	0.0003	5	114%	75	125	0%	
Vanadium	A	mg/L	0.5615	1.123		1	0.1424	0	0.0014006	0.01	5	98%	75	125	0%	
Zinc	A	mg/L	0.5035	1.007		1	0.15568	0	0.0008292	0.01	5	85%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700187	B18020068-010	6010.20-SPLP	MS3		2/14/2018 5:21:0	1	118411	2/12/2018 8:	1E+07	0	19.52

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	25.42	50.84		5	31.56	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.5228	1.0456		1	0.000784	0	4.068E-05	0.001	5	104%	75	125	0%	
Arsenic	A	mg/L	0.4808	0.9616		1	0.001274	0	0.000553	0.001	5	96%	75	125	0%	
Barium	A	mg/L	6.025	12.05		11	0.17626	0	0.0001486	0.05	5	108%	75	125	0%	
Beryllium	A	mg/L	0.2293	0.4586		0.5	0.000738	0	0.0000298	0.001	5	92%	75	125	0%	
Boron	A	mg/L	0.6764	1.3528		1	0.3086	0	0.0021	0.05	5	104%	75	125	0%	
Cadmium	A	mg/L	0.247	0.494		0.5	0	0	0.0001091	0.001	5	99%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700187	B18020068-010	6010.20-SPLP	MS3		2/14/2018 5:21:0	1	118411	2/12/2018 8:	1E+07	0	19.52

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.509	1.018		1	0.0222	0	0.0004384	0.005	5	100%	75	125	0%	
Cobalt	A	mg/L	0.5259	1.0518		1	0.003866	0	0.0001741	0.005	5	105%	75	125	0%	
Copper	A	mg/L	0.5061	1.0122		1	0.011446	0	0.0003054	0.005	5	100%	75	125	0%	
Lead	A	mg/L	0.5355	1.071		1	0.008812	0	5.232E-05	0.001	5	106%	75	125	0%	
Manganese	A	mg/L	2.621	5.242		5	0.10966	0	0.0001697	0.001	5	103%	75	125	0%	
Molybdenum	A	mg/L	0.517	1.034		1	0.002896	0	8.548E-05	0.001	5	103%	75	125	0%	
Nickel	A	mg/L	0.5124	1.0248		1	0.009536	0	9.454E-05	0.005	5	102%	75	125	0%	
Selenium	A	mg/L	0.4115	0.823		1	0.001066	0	0.0005098	0.001	5	82%	75	125	0%	
Silver	A	mg/L	0.2664	0.5328		0.5	0.00015	0	0.0001425	0.001	0.25	107%	75	125	0%	
Strontium	A	mg/L	0.6456	1.2912		1	0.19022	0	2.936E-05	0.01	5	110%	75	125	0%	
Thallium	A	mg/L	0.5128	1.0256		1	0.00028	0	0.0000529	0.0005	5	103%	75	125	0%	
Tin	A	mg/L	0.5972	1.1944		1	0.003776	0	0.0004036	0.05	5	119%	75	125	0%	
Titanium	A	mg/L	0.6176	1.2352		1	0.2618	0	0.0004704	0.005	5	97%	75	125	0%	
Uranium	A	mg/L	0.5777	1.1554		1	0.002806	0	3.644E-05	0.0003	5	115%	75	125	0%	
Vanadium	A	mg/L	0.5297	1.0594		1	0.03776	0	0.0014006	0.01	5	102%	75	125	0%	
Zinc	A	mg/L	0.4617	0.9234		1	0.05174	0	0.0008292	0.01	5	87%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700188	B18020068-011	6010.20-SPLP	MS3		2/14/2018 5:24:0	1	118411	2/12/2018 8:	1E+07	0	13.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	63.22	126.44		5	81.38	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.4556	0.9112		1	0.001386	0	4.068E-05	0.001	5	91%	75	125	0%	
Arsenic	A	mg/L	0.4925	0.985		1	0.02024	0	0.000553	0.001	5	96%	75	125	0%	
Barium	A	mg/L	6.512	13.024		11	0.54	0	0.0001486	0.05	5	113%	75	125	0%	
Beryllium	A	mg/L	0.2171	0.4342		0.5	0.003562	0	0.0000298	0.001	5	86%	75	125	0%	
Boron	A	mg/L	0.6767	1.3534		1	0.3636	0	0.0021	0.05	5	99%	75	125	0%	
Cadmium	A	mg/L	0.2451	0.4902		0.5	0	0	0.0001091	0.001	5	98%	75	125	0%	
Chromium	A	mg/L	0.5386	1.0772		1	0.05908	0	0.0004384	0.005	5	102%	75	125	0%	
Cobalt	A	mg/L	0.5357	1.0714		1	0.02826	0	0.0001741	0.005	5	104%	75	125	0%	
Copper	A	mg/L	0.5147	1.0294		1	0.02938	0	0.0003054	0.005	5	100%	75	125	0%	
Lead	A	mg/L	0.5547	1.1094		1	0.0443	0	5.232E-05	0.001	5	107%	75	125	0%	
Manganese	A	mg/L	2.893	5.786		5	0.6354	0	0.0001697	0.001	5	103%	75	125	0%	
Molybdenum	A	mg/L	0.5283	1.0566		1	0.003502	0	8.548E-05	0.001	5	105%	75	125	0%	
Nickel	A	mg/L	0.5226	1.0452		1	0.04016	0	9.454E-05	0.005	5	101%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700188	B18020068-011	6010.20-SPLP	MS3		2/14/2018 5:24:0	1	118411	2/12/2018 8:	1E+07	0	13.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	0.4129	0.8258		1	0.001048	0	0.0005098	0.001	5	82%	75	125	0%	
Silver	A	mg/L	0.2694	0.5388		0.5	0	0	0.0001425	0.001	0.25	108%	75	125	0%	
Strontium	A	mg/L	0.712	1.424		1	0.2966	0	2.936E-05	0.01	5	113%	75	125	0%	
Thallium	A	mg/L	0.5096	1.0192		1	0.000566	0	0.0000529	0.0005	5	102%	75	125	0%	
Tin	A	mg/L	0.5814	1.1628		1	0.005792	0	0.0004036	0.05	5	116%	75	125	0%	
Titanium	A	mg/L	0.8425	1.685		1	0.6086	0	0.0004704	0.005	5	108%	75	125	0%	
Uranium	A	mg/L	0.5925	1.185		1	0.007226	0	3.644E-05	0.0003	5	118%	75	125	0%	
Vanadium	A	mg/L	0.5907	1.1814		1	0.14198	0	0.0014006	0.01	5	104%	75	125	0%	
Zinc	A	mg/L	0.5157	1.0314		1	0.1448	0	0.0008292	0.01	5	89%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700189	B18020068-012	6010.20-SPLP	MS3		2/14/2018 5:26:0	1	118411	2/12/2018 8:	1E+07	0	19.92

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	27.17	54.34		5	35.06	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.4825	0.965		1	0.0006	0	4.068E-05	0.001	5	96%	75	125	0%	
Arsenic	A	mg/L	0.4723	0.9446		1	0.003882	0	0.000553	0.001	5	94%	75	125	0%	
Barium	A	mg/L	5.978	11.956		11	0.303	0	0.0001486	0.05	5	106%	75	125	0%	
Beryllium	A	mg/L	0.2137	0.4274		0.5	0.001138	0	0.0000298	0.001	5	85%	75	125	0%	
Boron	A	mg/L	0.574	1.148		1	0.17406	0	0.0021	0.05	5	97%	75	125	0%	
Cadmium	A	mg/L	0.2304	0.4608		0.5	0	0	0.0001091	0.001	5	92%	75	125	0%	
Chromium	A	mg/L	0.4976	0.9952		1	0.02558	0	0.0004384	0.005	5	97%	75	125	0%	
Cobalt	A	mg/L	0.4865	0.973		1	0.006572	0	0.0001741	0.005	5	97%	75	125	0%	
Copper	A	mg/L	0.4809	0.9618		1	0.013792	0	0.0003054	0.005	5	95%	75	125	0%	
Lead	A	mg/L	0.5261	1.0522		1	0.013468	0	5.232E-05	0.001	5	104%	75	125	0%	
Manganese	A	mg/L	2.553	5.106		5	0.15066	0	0.0001697	0.001	5	99%	75	125	0%	
Molybdenum	A	mg/L	0.5074	1.0148		1	0.00224	0	8.548E-05	0.001	5	101%	75	125	0%	
Nickel	A	mg/L	0.4874	0.9748		1	0.013982	0	9.454E-05	0.005	5	96%	75	125	0%	
Selenium	A	mg/L	0.4003	0.8006		1	0.000706	0	0.0005098	0.001	5	80%	75	125	0%	
Silver	A	mg/L	0.252	0.504		0.5	0	0	0.0001425	0.001	0.25	101%	75	125	0%	
Strontium	A	mg/L	0.6358	1.2716		1	0.2078	0	2.936E-05	0.01	5	106%	75	125	0%	
Thallium	A	mg/L	0.4959	0.9918		1	0.000252	0	0.0000529	0.0005	5	99%	75	125	0%	
Tin	A	mg/L	0.5611	1.1222		1	0.003286	0	0.0004036	0.05	5	112%	75	125	0%	
Titanium	A	mg/L	0.6556	1.3112		1	0.3562	0	0.0004704	0.005	5	96%	75	125	0%	
Uranium	A	mg/L	0.5632	1.1264		1	0.012672	0	3.644E-05	0.0003	5	111%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700189	B18020068-012	6010.20-SPLP	MS3		2/14/2018 5:26:0	1	118411	2/12/2018 8:	1E+07	0	19.92

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	0.5162	1.0324		1	0.04502	0	0.0014006	0.01	5	99%	75	125	0%	
Zinc	A	mg/L	0.4538	0.9076		1	0.05124	0	0.0008292	0.01	5	86%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700190	B18020068-013	6010.20-SPLP	MS3		2/14/2018 5:28:0	1	118411	2/12/2018 8:	1E+07	0	21.19

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	7.728	15.456		5	7.456	0	0.004008	0.03	5	160%	75	125	0%	S
Antimony	A	mg/L	0.4999	0.9998		1	0.000544	0	4.068E-05	0.001	5	100%	75	125	0%	
Arsenic	A	mg/L	0.469	0.938		1	0.003654	0	0.000553	0.001	5	93%	75	125	0%	
Barium	A	mg/L	5.781	11.562		11	0.0774	0	0.0001486	0.05	5	104%	75	125	0%	
Beryllium	A	mg/L	0.2224	0.4448		0.5	0.00003	0	0.0000298	0.001	5	89%	75	125	0%	
Boron	A	mg/L	0.5946	1.1892		1	0.17868	0	0.0021	0.05	5	101%	75	125	0%	
Cadmium	A	mg/L	0.2309	0.4618		0.5	0	0	0.0001091	0.001	5	92%	75	125	0%	
Chromium	A	mg/L	0.4734	0.9468		1	0.006718	0	0.0004384	0.005	5	94%	75	125	0%	
Cobalt	A	mg/L	0.4913	0.9826		1	0.000656	0	0.0001741	0.005	5	98%	75	125	0%	
Copper	A	mg/L	0.4842	0.9684		1	0.003992	0	0.0003054	0.005	5	96%	75	125	0%	
Lead	A	mg/L	0.5166	1.0332		1	0.005604	0	5.232E-05	0.001	5	103%	75	125	0%	
Manganese	A	mg/L	2.463	4.926		5	0.0255	0	0.0001697	0.001	5	98%	75	125	0%	
Molybdenum	A	mg/L	0.5196	1.0392		1	0.04406	0	8.548E-05	0.001	5	100%	75	125	0%	
Nickel	A	mg/L	0.4864	0.9728		1	0.002978	0	9.454E-05	0.005	5	97%	75	125	0%	
Selenium	A	mg/L	0.4012	0.8024		1	0.001096	0	0.0005098	0.001	5	80%	75	125	0%	
Silver	A	mg/L	0.247	0.494		0.5	0	0	0.0001425	0.001	0.25	99%	75	125	0%	
Strontium	A	mg/L	0.5787	1.1574		1	0.09348	0	2.936E-05	0.01	5	106%	75	125	0%	
Thallium	A	mg/L	0.4975	0.995		1	0	0	0.0000529	0.0005	5	100%	75	125	0%	
Tin	A	mg/L	0.5602	1.1204		1	0.002448	0	0.0004036	0.05	5	112%	75	125	0%	
Titanium	A	mg/L	0.5298	1.0596		1	0.09444	0	0.0004704	0.005	5	97%	75	125	0%	
Uranium	A	mg/L	0.6277	1.2554		1	0.1676	0	3.644E-05	0.0003	5	109%	75	125	0%	
Vanadium	A	mg/L	0.5085	1.017		1	0.015934	0	0.0014006	0.01	5	100%	75	125	0%	
Zinc	A	mg/L	0.4436	0.8872		1	0.01311	0	0.0008292	0.01	5	87%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700191	B18020068-014	6010.20-SPLP	MS3		2/14/2018 5:31:0	1	118411	2/12/2018 8:	1E+07	0	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	10.39	20.78		5	9.942	0	0.004008	0.03	5	217%	75	125	0%	S
Antimony	A	mg/L	0.5173	1.0346		1	0.000898	0	4.068E-05	0.001	5	103%	75	125	0%	
Arsenic	A	mg/L	0.4701	0.9402		1	0.009706	0	0.000553	0.001	5	93%	75	125	0%	
Barium	A	mg/L	5.94	11.88		11	0.16694	0	0.0001486	0.05	5	106%	75	125	0%	
Beryllium	A	mg/L	0.2236	0.4472		0.5	0.000236	0	0.0000298	0.001	5	89%	75	125	0%	
Boron	A	mg/L	0.5699	1.1398		1	0.13816	0	0.0021	0.05	5	100%	75	125	0%	
Cadmium	A	mg/L	0.2291	0.4582		0.5	0	0	0.0001091	0.001	5	92%	75	125	0%	
Chromium	A	mg/L	0.4782	0.9564		1	0.008952	0	0.0004384	0.005	5	95%	75	125	0%	
Cobalt	A	mg/L	0.4931	0.9862		1	0.007844	0	0.0001741	0.005	5	98%	75	125	0%	
Copper	A	mg/L	0.4922	0.9844		1	0.005428	0	0.0003054	0.005	5	98%	75	125	0%	
Lead	A	mg/L	0.527	1.054		1	0.011328	0	5.232E-05	0.001	5	104%	75	125	0%	
Manganese	A	mg/L	2.639	5.278		5	0.51	0	0.0001697	0.001	5	95%	75	125	0%	
Molybdenum	A	mg/L	0.5156	1.0312		1	0.03402	0	8.548E-05	0.001	5	100%	75	125	0%	
Nickel	A	mg/L	0.4867	0.9734		1	0.00982	0	9.454E-05	0.005	5	96%	75	125	0%	
Selenium	A	mg/L	0.4002	0.8004		1	0	0	0.0005098	0.001	5	80%	75	125	0%	
Silver	A	mg/L	0.2504	0.5008		0.5	0	0	0.0001425	0.001	0.25	100%	75	125	0%	
Strontium	A	mg/L	0.5632	1.1264		1	0.06254	0	2.936E-05	0.01	5	106%	75	125	0%	
Thallium	A	mg/L	0.4943	0.9886		1	0.000082	0	0.0000529	0.0005	5	99%	75	125	0%	
Tin	A	mg/L	0.5638	1.1276		1	0.00232	0	0.0004036	0.05	5	113%	75	125	0%	
Titanium	A	mg/L	0.5266	1.0532		1	0.11468	0	0.0004704	0.005	5	94%	75	125	0%	
Uranium	A	mg/L	0.5963	1.1926		1	0.04616	0	3.644E-05	0.0003	5	115%	75	125	0%	
Vanadium	A	mg/L	0.4948	0.9896		1	0.03404	0	0.0014006	0.01	5	96%	75	125	0%	
Zinc	A	mg/L	0.4448	0.8896		1	0.02178	0	0.0008292	0.01	5	87%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700192	B18020068-014	6010.20-SPLP	MSD3		2/14/2018 5:33:0	1	118411	2/12/2018 8:	1E+07	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	10.57	21.14		5	9.942	20.78	0.004008	0.03	5	224%	75	125	2%	S
Antimony	A	mg/L	0.5128	1.0256		1	0.000898	1.0346	4.068E-05	0.001	5	102%	75	125	1%	
Arsenic	A	mg/L	0.4711	0.9422		1	0.009706	0.9402	0.000553	0.001	5	93%	75	125	0%	
Barium	A	mg/L	5.924	11.848		1	0.16694	11.88	0.0001486	0.05	5	1168%	75	125	0%	S
Beryllium	A	mg/L	0.2236	0.4472		0.5	0.000236	0.4472	0.0000298	0.001	5	89%	75	125	0%	
Boron	A	mg/L	0.5794	1.1588		1	0.13816	1.1398	0.0021	0.05	5	102%	75	125	2%	
Cadmium	A	mg/L	0.2303	0.4606		0.5	0	0.4582	0.0001091	0.001	5	92%	75	125	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700192	B18020068-014	6010.20-SPLP	MSD3		2/14/2018 5:33:0	1	118411	2/12/2018 8:	1E+07	1E+07	3.07

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.4693	0.9386		1	0.008952	0.9564	0.0004384	0.005	5	93%	75	125	2%	
Cobalt	A	mg/L	0.4923	0.9846		1	0.007844	0.9862	0.0001741	0.005	5	98%	75	125	0%	
Copper	A	mg/L	0.48	0.96		1	0.005428	0.9844	0.0003054	0.005	5	95%	75	125	3%	
Lead	A	mg/L	0.5193	1.0386		1	0.011328	1.054	5.232E-05	0.001	5	103%	75	125	1%	
Manganese	A	mg/L	2.698	5.396		5	0.51	5.278	0.0001697	0.001	5	98%	75	125	2%	
Molybdenum	A	mg/L	0.5235	1.047		1	0.03402	1.0312	8.548E-05	0.001	5	101%	75	125	2%	
Nickel	A	mg/L	0.4824	0.9648		1	0.00982	0.9734	9.454E-05	0.005	5	95%	75	125	1%	
Selenium	A	mg/L	0.3984	0.7968		1	0	0.8004	0.0005098	0.001	5	80%	75	125	0%	
Silver	A	mg/L	0.2546	0.5092		0.5	0	0.5008	0.0001425	0.001	0.25	102%	75	125	2%	
Strontium	A	mg/L	0.5573	1.1146		1	0.06254	1.1264	2.936E-05	0.01	5	105%	75	125	1%	
Thallium	A	mg/L	0.4905	0.981		1	0.000082	0.9886	0.0000529	0.0005	5	98%	75	125	1%	
Tin	A	mg/L	0.5568	1.1136		1	0.00232	1.1276	0.0004036	0.05	5	111%	75	125	1%	
Titanium	A	mg/L	0.5388	1.0776		1	0.11468	1.0532	0.0004704	0.005	5	96%	75	125	2%	
Uranium	A	mg/L	0.5762	1.1524		1	0.04616	1.1926	3.644E-05	0.0003	5	111%	75	125	3%	
Vanadium	A	mg/L	0.4991	0.9982		1	0.03404	0.9896	0.0014006	0.01	5	96%	75	125	1%	
Zinc	A	mg/L	0.4419	0.8838		1	0.02178	0.8896	0.0008292	0.01	5	86%	75	125	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700193	B18020068-015	6010.20-SPLP	MS3		2/14/2018 5:36:0	1	118411	2/12/2018 8:	1E+07	0	18.13

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	8.197	16.394		5	7.996	0	0.004008	0.03	5	168%	75	125	0%	S
Antimony	A	mg/L	0.5139	1.0278		1	0.000368	0	4.068E-05	0.001	5	103%	75	125	0%	
Arsenic	A	mg/L	0.4714	0.9428		1	0.000626	0	0.000553	0.001	5	94%	75	125	0%	
Barium	A	mg/L	5.942	11.884		11	0.10164	0	0.0001486	0.05	5	107%	75	125	0%	
Beryllium	A	mg/L	0.2257	0.4514		0.5	0.000078	0	0.0000298	0.001	5	90%	75	125	0%	
Boron	A	mg/L	0.5876	1.1752		1	0.15586	0	0.0021	0.05	5	102%	75	125	0%	
Cadmium	A	mg/L	0.2316	0.4632		0.5	0	0	0.0001091	0.001	5	93%	75	125	0%	
Chromium	A	mg/L	0.4744	0.9488		1	0.007564	0	0.0004384	0.005	5	94%	75	125	0%	
Cobalt	A	mg/L	0.4905	0.981		1	0.000862	0	0.0001741	0.005	5	98%	75	125	0%	
Copper	A	mg/L	0.4988	0.9976		1	0.002778	0	0.0003054	0.005	5	99%	75	125	0%	
Lead	A	mg/L	0.5221	1.0442		1	0.002754	0	5.232E-05	0.001	5	104%	75	125	0%	
Manganese	A	mg/L	2.459	4.918		5	0.02624	0	0.0001697	0.001	5	98%	75	125	0%	
Molybdenum	A	mg/L	0.5111	1.0222		1	0.001514	0	8.548E-05	0.001	5	102%	75	125	0%	
Nickel	A	mg/L	0.4846	0.9692		1	0.00347	0	9.454E-05	0.005	5	97%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700193	B18020068-015	6010.20-SPLP	MS3		2/14/2018 5:36:0	1	118411	2/12/2018 8:	1E+07	0	18.13

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	0.4084	0.8168		1	0.000622	0	0.0005098	0.001	5	82%	75	125	0%	
Silver	A	mg/L	0.2469	0.4938		0.5	0	0	0.0001425	0.001	0.25	99%	75	125	0%	
Strontium	A	mg/L	0.6447	1.2894		1	0.2126	0	2.936E-05	0.01	5	108%	75	125	0%	
Thallium	A	mg/L	0.4949	0.9898		1	0	0	0.0000529	0.0005	5	99%	75	125	0%	
Tin	A	mg/L	0.5612	1.1224		1	0.002476	0	0.0004036	0.05	5	112%	75	125	0%	
Titanium	A	mg/L	0.5137	1.0274		1	0.08628	0	0.0004704	0.005	5	94%	75	125	0%	
Uranium	A	mg/L	0.5554	1.1108		1	0.008146	0	3.644E-05	0.0003	5	110%	75	125	0%	
Vanadium	A	mg/L	0.4944	0.9888		1	0.00908	0	0.0014006	0.01	5	98%	75	125	0%	
Zinc	A	mg/L	0.4536	0.9072		1	0.011578	0	0.0008292	0.01	5	90%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700194	B18020068-016	6010.20-SPLP	MS3		2/14/2018 5:38:0	1	118411	2/12/2018 8:	1E+07	0	21.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	35.31	70.62		5	46.92	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.4784	0.9568		1	0.000768	0	4.068E-05	0.001	5	96%	75	125	0%	
Arsenic	A	mg/L	0.4623	0.9246		1	0.002098	0	0.000553	0.001	5	92%	75	125	0%	
Barium	A	mg/L	5.896	11.792		11	0.2294	0	0.0001486	0.05	5	105%	75	125	0%	
Beryllium	A	mg/L	0.2035	0.407		0.5	0.00126	0	0.0000298	0.001	5	81%	75	125	0%	
Boron	A	mg/L	0.6058	1.2116		1	0.3036	0	0.0021	0.05	5	91%	75	125	0%	
Cadmium	A	mg/L	0.2294	0.4588		0.5	0	0	0.0001091	0.001	5	92%	75	125	0%	
Chromium	A	mg/L	0.4797	0.9594		1	0.0329	0	0.0004384	0.005	5	93%	75	125	0%	
Cobalt	A	mg/L	0.4918	0.9836		1	0.007446	0	0.0001741	0.005	5	98%	75	125	0%	
Copper	A	mg/L	0.4751	0.9502		1	0.016998	0	0.0003054	0.005	5	93%	75	125	0%	
Lead	A	mg/L	0.5086	1.0172		1	0.010662	0	5.232E-05	0.001	5	101%	75	125	0%	
Manganese	A	mg/L	2.506	5.012		5	0.2554	0	0.0001697	0.001	5	95%	75	125	0%	
Molybdenum	A	mg/L	0.4852	0.9704		1	0.004166	0	8.548E-05	0.001	5	97%	75	125	0%	
Nickel	A	mg/L	0.4786	0.9572		1	0.018146	0	9.454E-05	0.005	5	94%	75	125	0%	
Selenium	A	mg/L	0.3929	0.7858		1	0.001056	0	0.0005098	0.001	5	78%	75	125	0%	
Silver	A	mg/L	0.2483	0.4966		0.5	0	0	0.0001425	0.001	0.25	99%	75	125	0%	
Strontium	A	mg/L	0.6404	1.2808		1	0.2522	0	2.936E-05	0.01	5	103%	75	125	0%	
Thallium	A	mg/L	0.48	0.96		1	0.00023	0	0.0000529	0.0005	5	96%	75	125	0%	
Tin	A	mg/L	0.5426	1.0852		1	0.00374	0	0.0004036	0.05	5	108%	75	125	0%	
Titanium	A	mg/L	0.6242	1.2484		1	0.3034	0	0.0004704	0.005	5	95%	75	125	0%	
Uranium	A	mg/L	0.5452	1.0904		1	0.007414	0	3.644E-05	0.0003	5	108%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700194	B18020068-016	6010.20-SPLP	MS3		2/14/2018 5:38:0	1	118411	2/12/2018 8:	1E+07	0	21.04

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	0.5053	1.0106		1	0.05274	0	0.0014006	0.01	5	96%	75	125	0%	
Zinc	A	mg/L	0.4549	0.9098		1	0.06292	0	0.0008292	0.01	5	85%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700195	CCV	ICPMS-200.8-W CCV			2/14/2018 5:41:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.1132	0.1132		0.05	0	0	0.0002849	0.1	4.5	226%	90	110	0%	S
Antimony	A	mg/L	0.05132	0.05132		0.05	0	0	3.047E-05	0.05	18	103%	90	110	0%	
Arsenic	A	mg/L	0.05145	0.05145		0.05	0	0	6.629E-05	0.005	18	103%	90	110	0%	
Barium	A	mg/L	0.06504	0.06504		0.05	0	0	6.437E-05	0.1	18	130%	90	110	0%	S
Beryllium	A	mg/L	0.04862	0.04862		0.05	0	0	8.97E-06	0.001	4.5	97%	90	110	0%	
Boron	A	mg/L	0.06131	0.06131		0.05	0	0	0.00141	0.1	4.5	123%	90	110	0%	S
Cadmium	A	mg/L	0.05029	0.05029		0.05	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.05299	0.05299		0.05	0	0	2.257E-05	0.001	4.5	106%	90	110	0%	
Chromium	A	mg/L	0.04945	0.04945		0.05	0	0	5.576E-05	0.01	18	99%	90	110	0%	
Cobalt	A	mg/L	0.05083	0.05083		0.05	0	0	3.904E-05	0.01	18	102%	90	110	0%	
Copper	A	mg/L	0.05128	0.05128		0.05	0	0	7.681E-05	0.01	4.5	103%	90	110	0%	
Iron	A	mg/L	1.332	1.332		1.3	0	0	0.000175	0.02	4.5	102%	90	110	0%	
Lanthanum	A	mg/L	0.05192	0.05192		0.05	0	0	0.0000111	0.001	4.5	104%	90	110	0%	
Lead	A	mg/L	0.0528	0.0528		0.05	0	0	2.956E-05	0.01	18	106%	90	110	0%	
Manganese	A	mg/L	0.05634	0.05634		0.05	0	0	3.649E-05	0.01	18	113%	90	110	0%	S
Mercury	A	mg/L	0.001084	0.001084		0.001	0	0	1.289E-05	0.001	0.36	108%	90	110	0%	
Molybdenum	A	mg/L	0.04978	0.04978		0.05	0	0	2.302E-05	0.005	9	100%	90	110	0%	
Nickel	A	mg/L	0.0504	0.0504		0.05	0	0	7.128E-05	0.01	4.5	101%	90	110	0%	
Selenium	A	mg/L	0.05255	0.05255		0.05	0	0	0.0001532	0.005	18	105%	90	110	0%	
Silver	A	mg/L	0.0195	0.0195		0.02	0	0	2.959E-05	0.005	1.8	98%	90	110	0%	
Strontium	A	mg/L	0.05459	0.05459		0.05	0	0	1.229E-05	0.1	18	109%	90	110	0%	
Thallium	A	mg/L	0.0511	0.0511		0.05	0	0	1.434E-05	0.1	18	102%	90	110	0%	
Thorium	A	mg/L	0.04791	0.04791		0.05	0	0	5.767E-05	0.001	4.5	96%	90	110	0%	
Thorium 232	A	mg/L	0.04791	0.04791		0.05	0	0	5.767E-05	0.01	4.5	96%	90	110	0%	
Tin	A	mg/L	0.05174	0.05174		0.05	0	0	5.199E-05	0.1	9	103%	90	110	0%	
Titanium	A	mg/L	0.04888	0.04888		0.05	0	0	0.0001736	0.01	18	98%	90	110	0%	
Uranium	A	mg/L	0.05288	0.05288		0.05	0	0	1.332E-05	0.001	4.5	106%	90	110	0%	
Vanadium	A	mg/L	0.04847	0.04847		0.05	0	0	7.351E-05	0.1	18	97%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700195	CCV	ICPMS-200.8-W CCV			2/14/2018 5:41:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/L	0.05259	0.05259		0.05	0	0	0.0002495	0.01	4.5	105%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700196	Rinse	ICPMS-200.8-W SAMP			2/14/2018 5:43:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000733	0.000733		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000656	0.000656		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000325	0.000325		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000249	0.000249		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000545	0.000545		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000468	0.000468		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.00045	0.00045		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000478	0.000478		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.01274	0.01274		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000555	0.000555		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000766	0.000766		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000022	0.000022		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000883	0.000883		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000497	0.000497		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000266	0.000266		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000389	0.000389		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000618	0.000618		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000097	0.000097		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000991	0.000991		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000991	0.000991		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.001269	0.001269		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000692	0.000692		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000564	0.000564		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000543	0.000543		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000593	0.000593		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700197	CCB	ICPMS-200.8-W	CCB		2/14/2018 5:46:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01372	0.01372		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000359	0.000359		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000282	0.000282		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	0.003096	0.003096		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000182	0.000182		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.005603	0.005603		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000156	0.000156		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000283	0.000283		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000176	0.000176		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	0.000222	0.000222		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000324	0.000324		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.005189	0.005189		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000274	0.000274		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000297	0.000297		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.001237	0.001237		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000007	0.000007		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000384	0.000384		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.00021	0.00021		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000022	-0.000022		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000178	0.000178		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000342	0.000342		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000116	-0.000116		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000424	0.000424		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000424	0.000424		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000584	0.000584		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000341	0.000341		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000264	0.000264		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000255	0.000255		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000294	0.000294		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700198	B18020068-017	6010.20-SPLP	MS3		2/14/2018 5:49:0	1	118411	2/12/2018 8:	1E+07	0	11.51

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700198	B18020068-017	6010.20-SPLP	MS3		2/14/2018 5:49:0	1	118411	2/12/2018 8:	1E+07	0	11.51

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	10.44	20.88		5	11.466	0	0.004008	0.03	5	188%	75	125	0%	S
Antimony	A	mg/L	0.515	1.03		1	0.001462	0	4.068E-05	0.001	5	103%	75	125	0%	
Arsenic	A	mg/L	0.4702	0.9404		1	0.018158	0	0.000553	0.001	5	92%	75	125	0%	
Barium	A	mg/L	5.947	11.894		11	0.3056	0	0.0001486	0.05	5	105%	75	125	0%	
Beryllium	A	mg/L	0.2174	0.4348		0.5	0.000736	0	0.0000298	0.001	5	87%	75	125	0%	
Boron	A	mg/L	0.5858	1.1716		1	0.222	0	0.0021	0.05	5	95%	75	125	0%	
Cadmium	A	mg/L	0.23	0.46		0.5	0	0	0.0001091	0.001	5	92%	75	125	0%	
Chromium	A	mg/L	0.4791	0.9582		1	0.012174	0	0.0004384	0.005	5	95%	75	125	0%	
Cobalt	A	mg/L	0.4906	0.9812		1	0.017916	0	0.0001741	0.005	5	96%	75	125	0%	
Copper	A	mg/L	0.4915	0.983		1	0.012252	0	0.0003054	0.005	5	97%	75	125	0%	
Lead	A	mg/L	0.5185	1.037		1	0.014792	0	5.232E-05	0.001	5	102%	75	125	0%	
Manganese	A	mg/L	2.839	5.678		5	0.927	0	0.0001697	0.001	5	95%	75	125	0%	
Molybdenum	A	mg/L	0.492	0.984		1	0.003448	0	8.548E-05	0.001	5	98%	75	125	0%	
Nickel	A	mg/L	0.4825	0.965		1	0.017334	0	9.454E-05	0.005	5	95%	75	125	0%	
Selenium	A	mg/L	0.4024	0.8048		1	0.010306	0	0.0005098	0.001	5	79%	75	125	0%	
Silver	A	mg/L	0.254	0.508		0.5	0	0	0.0001425	0.001	0.25	102%	75	125	0%	
Strontium	A	mg/L	0.5823	1.1646		1	0.10532	0	2.936E-05	0.01	5	106%	75	125	0%	
Thallium	A	mg/L	0.487	0.974		1	0.0001	0	0.0000529	0.0005	5	97%	75	125	0%	
Tin	A	mg/L	0.5692	1.1384		1	0.002466	0	0.0004036	0.05	5	114%	75	125	0%	
Titanium	A	mg/L	0.59	1.18		1	0.25	0	0.0004704	0.005	5	93%	75	125	0%	
Uranium	A	mg/L	0.5613	1.1226		1	0.02958	0	3.644E-05	0.0003	5	109%	75	125	0%	
Vanadium	A	mg/L	0.5012	1.0024		1	0.04572	0	0.0014006	0.01	5	96%	75	125	0%	
Zinc	A	mg/L	0.4578	0.9156		1	0.04324	0	0.0008292	0.01	5	87%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700199	B18020068-018	6010.20-SPLP	MS3		2/14/2018 5:51:0	1	118411	2/12/2018 8:	1E+07	0	15.08

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	57.29	114.58		5	76.64	0	0.004008	0.03	5		75	125	0%	A
Antimony	A	mg/L	0.4347	0.8694		1	0.001754	0	4.068E-05	0.001	5	87%	75	125	0%	
Arsenic	A	mg/L	0.4798	0.9596		1	0.006716	0	0.000553	0.001	5	95%	75	125	0%	
Barium	A	mg/L	6.071	12.142		11	0.3204	0	0.0001486	0.05	5	107%	75	125	0%	
Beryllium	A	mg/L	0.205	0.41		0.5	0.002686	0	0.0000298	0.001	5	81%	75	125	0%	
Boron	A	mg/L	0.6868	1.3736		1	0.448	0	0.0021	0.05	5	93%	75	125	0%	
Cadmium	A	mg/L	0.2373	0.4746		0.5	0	0	0.0001091	0.001	5	95%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700199	B18020068-018	6010.20-SPLP	MS3		2/14/2018 5:51:0	1	118411	2/12/2018 8:	1E+07	0	15.08

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.5131	1.0262		1	0.0561	0	0.0004384	0.005	5	97%	75	125	0%	
Cobalt	A	mg/L	0.5034	1.0068		1	0.013486	0	0.0001741	0.005	5	99%	75	125	0%	
Copper	A	mg/L	0.5105	1.021		1	0.04098	0	0.0003054	0.005	5	98%	75	125	0%	
Lead	A	mg/L	0.5387	1.0774		1	0.02814	0	5.232E-05	0.001	5	105%	75	125	0%	
Manganese	A	mg/L	3.356	6.712		5	1.7466	0	0.0001697	0.001	5	99%	75	125	0%	
Molybdenum	A	mg/L	0.5056	1.0112		1	0.00649	0	8.548E-05	0.001	5	100%	75	125	0%	
Nickel	A	mg/L	0.5014	1.0028		1	0.02604	0	9.454E-05	0.005	5	98%	75	125	0%	
Selenium	A	mg/L	0.4091	0.8182		1	0.000702	0	0.0005098	0.001	5	82%	75	125	0%	
Silver	A	mg/L	0.2602	0.5204		0.5	0	0	0.0001425	0.001	0.25	104%	75	125	0%	
Strontium	A	mg/L	0.7777	1.5554		1	0.4422	0	2.936E-05	0.01	5	111%	75	125	0%	
Thallium	A	mg/L	0.4992	0.9984		1	0.000478	0	0.0000529	0.0005	5	100%	75	125	0%	
Tin	A	mg/L	0.5581	1.1162		1	0.005134	0	0.0004036	0.05	5	111%	75	125	0%	
Titanium	A	mg/L	0.8063	1.6126		1	0.5254	0	0.0004704	0.005	5	109%	75	125	0%	
Uranium	A	mg/L	0.576	1.152		1	0.007644	0	3.644E-05	0.0003	5	114%	75	125	0%	
Vanadium	A	mg/L	0.57	1.14		1	0.12692	0	0.0014006	0.01	5	101%	75	125	0%	
Zinc	A	mg/L	0.5011	1.0022		1	0.12394	0	0.0008292	0.01	5	88%	75	125	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700200	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 5:53:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.001053	0.001053		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.001168	0.001168		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000516	0.000516		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.00045	0.00045		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000983	0.000983		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000884	0.000884		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000887	0.000887		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000939	0.000939		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000958	0.000958		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.001184	0.001184		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000003	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.00122	0.00122		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000944	0.000944		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000975	0.000975		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700200	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 5:53:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	mg/L	0.000531	0.000531		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.001223	0.001223		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000385	0.000385		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Tin	A	mg/L	0.001101	0.001101		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.001569	0.001569		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000919	0.000919		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.001005	0.001005		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000999	0.000999		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700201	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 5:56:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000393	0.000393		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000454	0.000454		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.00027	0.00027		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000202	0.000202		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000396	0.000396		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000323	0.000323		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000315	0.000315		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000351	0.000351		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.01644	0.01644		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000394	0.000394		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000456	0.000456		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000007	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000492	0.000492		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000394	0.000394		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000134	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000214	0.000214		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000511	0.000511		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	0.000023	0.000023		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	J
Thorium	A	mg/L	0.000441	0.000441		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000441	0.000441		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000374	0.000374		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000642	0.000642		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700201	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 5:56:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	mg/L	0.000372	0.000372		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000377	0.000377		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000256	0.000256		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700202	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 5:59:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000163	0.000163		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000197	0.000197		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000137	0.000137		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000066	0.000066		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000182	0.000182		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000078	0.000078		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000123	0.000123		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000139	0.000139		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.006429	0.006429		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000162	0.000162		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000216	0.000216		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000006	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000159	0.000159		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000151	0.000151		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000069	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000103	0.000103		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000229	0.000229		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	-0.000157	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000174	0.000174		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.000174	0.000174		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000208	0.000208		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000338	0.000338		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000174	0.000174		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000102	0.000102		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000096	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700203	MB-118509	200.7.8-W-DW	MBLK		2/14/2018 6:01:0	1	118509	2/14/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.01324	0.01324		0	0	0	0.0002849	0.03	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000098	0.000098		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000016	0		0	0	0	6.629E-05	0.001	18	0%	0	0	0%	
Barium	A	mg/L	0.000873	0.000873		0	0	0	6.437E-05	0.05	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000089	0.000089		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.009439	0.009439		0	0	0	0.00141	0.05	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000039	0.000039		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Chromium	A	mg/L	0.000329	0.000329		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000071	0		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	
Copper	A	mg/L	0.000066	0		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.00001	0		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	
Manganese	A	mg/L	0.000453	0.000453		0	0	0	3.649E-05	0.001	18	0%	0	0	0%	
Mercury	A	mg/L	0.000002	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000049	0.000049		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000061	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000326	0		0	0	0	0.0001532	0.001	18	0%	0	0	0%	
Silver	A	mg/L	0.000373	0.000373		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	
Strontium	A	mg/L	0.000175	0.000175		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000316	0		0	0	0	1.434E-05	0.0005	18	0%	0	0	0%	
Thorium	A	mg/L	0.000137	0.000137		0	0	0	5.767E-05	0.005	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000137	0.000137		0	0	0	5.767E-05	0.005	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000142	0.000142		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	
Titanium	A	mg/L	0.000101	0		0	0	0	0.0001736	0.005	18	0%	0	0	0%	
Uranium	A	mg/L	0.000054	0.000054		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000089	0.000089		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	
Zinc	A	mg/L	0.000951	0.000951		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	
Uranium, Activity	C	pCi/L	0.03618	0.03618		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700204	B18020772-001	200.7.8-W-DW	SAMP		2/14/2018 6:04:0	1	118509	2/14/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000926	0.000926		0	0	0	3.047E-05	0.001	18	0%	0	0	0%	J
Beryllium	A	mg/L	0.000103	0.000103		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000145	0.000145		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700204	B18020772-001	200.7.8-W-DW	SAMP		2/14/2018 6:04:0	1	118509	2/14/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	A	mg/L	0.001349	0.001349		0	0	0	5.576E-05	0.005	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000484	0.000484		0	0	0	3.904E-05	0.005	18	0%	0	0	0%	J
Copper	A	mg/L	0.185	0.185		0	0	0	7.681E-05	0.005	4.5	0%	0	0	0%	
Lead	A	mg/L	0.005606	0.005606		0	0	0	2.956E-05	0.001	18	0%	0	0	0%	
Mercury	A	mg/L	0.000016	0.000016		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.01429	0.01429		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.05559	0.05559		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	0.000376	0.000376		0	0	0	0.0001532	0.001	18	0%	0	0	0%	J
Silver	A	mg/L	0.000195	0.000195		0	0	0	2.959E-05	0.001	0.1	0%	0	0	0%	J
Strontium	A	mg/L	0.431	0.431		0	0	0	1.229E-05	0.01	18	0%	0	0	0%	
Thorium	A	mg/L	0.001955	0.001955		0	0	0	5.767E-05	0.005	4.5	0%	0	0	0%	J
Thorium 232	A	mg/L	0.001955	0.001955		0	0	0	5.767E-05	0.005	4.5	0%	0	0	0%	J
Tin	A	mg/L	0.000279	0.000279		0	0	0	5.199E-05	0.05	9	0%	0	0	0%	J
Titanium	A	mg/L	0.001879	0.001879		0	0	0	0.0001736	0.005	18	0%	0	0	0%	J
Uranium	A	mg/L	0.003462	0.003462		0	0	0	1.332E-05	0.0003	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000614	0.000614		0	0	0	7.351E-05	0.01	18	0%	0	0	0%	J
Zinc	A	mg/L	0.1658	0.1658		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	
Uranium, Activity	C	pCi/L	2.31954	2.31954		0	0	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700205	LCS-118509	200.7.8-W-DW	LCS		2/14/2018 6:07:0	1	118509	2/14/2018 8:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	2.963	2.963		2.5	0.01324	0	0.0002849	0.03	4.5	118%	85	115	0%	S
Antimony	A	mg/L	0.5214	0.5214		0.5	0.000098	0	3.047E-05	0.001	18	104%	85	115	0%	
Arsenic	A	mg/L	0.5184	0.5184		0.5	0	0	6.629E-05	0.001	18	104%	85	115	0%	
Barium	A	mg/L	0.5272	0.5272		0.5	0.000873	0	6.437E-05	0.05	18	105%	85	115	0%	
Beryllium	A	mg/L	0.2458	0.2458		0.25	0.000089	0	8.97E-06	0.001	4.5	98%	85	115	0%	
Boron	A	mg/L	0.5473	0.5473		0.5	0.009439	0	0.00141	0.05	4.5	108%	85	115	0%	
Cadmium	A	mg/L	0.2543	0.2543		0.25	0.000039	0	1.468E-05	0.001	18	102%	85	115	0%	
Chromium	A	mg/L	0.4677	0.4677		0.5	0.000329	0	5.576E-05	0.005	18	93%	85	115	0%	
Cobalt	A	mg/L	0.4781	0.4781		0.5	0	0	3.904E-05	0.005	18	96%	85	115	0%	
Copper	A	mg/L	0.4933	0.4933		0.5	0	0	7.681E-05	0.005	4.5	99%	85	115	0%	
Lead	A	mg/L	0.5107	0.5107		0.5	0	0	2.956E-05	0.001	18	102%	85	115	0%	
Manganese	A	mg/L	2.491	2.491		2.5	0.000453	0	3.649E-05	0.001	18	100%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700205	LCS-118509	200.7.8-W-DW	LCS		2/14/2018 6:07:0	1	118509	2/14/2018 8:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Mercury	A	mg/L	0.000008	0		0	0	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.4883	0.4883		0.5	0.000049	0	2.302E-05	0.005	9	98%	85	115	0%	
Nickel	A	mg/L	0.4843	0.4843		0.5	0	0	7.128E-05	0.01	4.5	97%	85	115	0%	
Selenium	A	mg/L	0.507	0.507		0.5	0	0	0.0001532	0.001	18	101%	85	115	0%	
Silver	A	mg/L	0.05231	0.05231		0.05	0.000373	0	2.959E-05	0.001	0.1	104%	85	115	0%	
Strontium	A	mg/L	0.5136	0.5136		0.5	0.000175	0	1.229E-05	0.01	18	103%	85	115	0%	
Thallium	A	mg/L	0.4899	0.4899		0.5	0	0	1.434E-05	0.0005	18	98%	85	115	0%	
Thorium	A	mg/L	0.5395	0.5395		0.5	0.000137	0	5.767E-05	0.005	4.5	108%	85	115	0%	
Thorium 232	A	mg/L	0.5395	0.5395		0.5	0.000137	0	5.767E-05	0.005	4.5	108%	85	115	0%	
Tin	A	mg/L	0.5483	0.5483		0.5	0.000142	0	5.199E-05	0.05	9	110%	85	115	0%	
Titanium	A	mg/L	0.4652	0.4652		0.5	0	0	0.0001736	0.005	18	93%	85	115	0%	
Uranium	A	mg/L	0.5238	0.5238		0.5	0.000054	0	1.332E-05	0.0003	4.5	105%	85	115	0%	
Vanadium	A	mg/L	0.4782	0.4782		0.5	0.000089	0	7.351E-05	0.01	18	96%	85	115	0%	
Zinc	A	mg/L	0.4996	0.4996		0.5	0.000951	0	0.0002495	0.01	4.5	100%	85	115	0%	
Uranium, Activity	C	pCi/L	350.946	350.946		0	0.03618	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700206	B18020772-001	200.7.8-W-DW	MS3		2/14/2018 6:09:0	1	118509	2/14/2018 8:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	3.205	3.205		2.5	0.1504	0	0.0002849	0.03	4.5	122%	70	130	0%	
Antimony	A	mg/L	0.5446	0.5446		0.5	0.000926	0	3.047E-05	0.001	18	109%	70	130	0%	
Arsenic	A	mg/L	0.5297	0.5297		0.5	0.002255	0	6.629E-05	0.001	18	105%	70	130	0%	
Barium	A	mg/L	0.5361	0.5361		0.5	0.01068	0	6.437E-05	0.05	18	105%	70	130	0%	
Beryllium	A	mg/L	0.2332	0.2332		0.25	0.000103	0	8.97E-06	0.001	4.5	93%	70	130	0%	
Boron	A	mg/L	0.5604	0.5604		0.5	0.03376	0	0.00141	0.05	4.5	105%	70	130	0%	
Cadmium	A	mg/L	0.2472	0.2472		0.25	0.000145	0	1.468E-05	0.001	18	99%	70	130	0%	
Chromium	A	mg/L	0.5002	0.5002		0.5	0.001349	0	5.576E-05	0.005	18	100%	70	130	0%	
Cobalt	A	mg/L	0.5102	0.5102		0.5	0.000484	0	3.904E-05	0.005	18	102%	70	130	0%	
Copper	A	mg/L	0.6821	0.6821		0.5	0.185	0	7.681E-05	0.005	4.5	99%	70	130	0%	
Lead	A	mg/L	0.5196	0.5196		0.5	0.005606	0	2.956E-05	0.001	18	103%	70	130	0%	
Manganese	A	mg/L	2.578	2.578		2.5	0.0168	0	3.649E-05	0.001	18	102%	70	130	0%	
Mercury	A	mg/L	0.000028	0.000028		0	0.000016	0	1.289E-05	0.0001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.541	0.541		0.5	0.01429	0	2.302E-05	0.005	9	105%	70	130	0%	
Nickel	A	mg/L	0.5539	0.5539		0.5	0.05559	0	7.128E-05	0.01	4.5	100%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700206	B18020772-001	200.7.8-W-DW	MS3		2/14/2018 6:09:0	1	118509	2/14/2018 8:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	A	mg/L	0.4925	0.4925		0.5	0.000376	0	0.0001532	0.001	18	98%	70	130	0%	
Silver	A	mg/L	0.05126	0.05126		0.05	0.000195	0	2.959E-05	0.001	0.1	102%	70	130	0%	
Strontium	A	mg/L	0.9709	0.9709		0.5	0.431	0	1.229E-05	0.01	18	108%	70	130	0%	
Thallium	A	mg/L	0.4954	0.4954		0.5	0	0	1.434E-05	0.0005	18	99%	70	130	0%	
Thorium	A	mg/L	0.5636	0.5636		0.5	0.001955	0	5.767E-05	0.005	4.5	112%	70	130	0%	
Thorium 232	A	mg/L	0.5636	0.5636		0.5	0.001955	0	5.767E-05	0.005	4.5	112%	70	130	0%	
Tin	A	mg/L	0.5737	0.5737		0.5	0.000279	0	5.199E-05	0.05	9	115%	70	130	0%	
Titanium	A	mg/L	0.5043	0.5043		0.5	0.001879	0	0.0001736	0.005	18	100%	70	130	0%	
Uranium	A	mg/L	0.5508	0.5508		0.5	0.003462	0	1.332E-05	0.0003	4.5	109%	70	130	0%	
Vanadium	A	mg/L	0.5135	0.5135		0.5	0.000614	0	7.351E-05	0.01	18	103%	70	130	0%	
Zinc	A	mg/L	0.6484	0.6484		0.5	0.1658	0	0.0002495	0.01	4.5	97%	70	130	0%	
Uranium, Activity	C	pCi/L	369.036	369.036		0	2.31954	0	0.0089244	0.201	1000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700207	B18020772-001	200.7.8-W-DW	MSD3		2/14/2018 6:12:0	1	118509	2/14/2018 8:	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	3.355	3.355		2.5	0.1504	3.205	0.0002849	0.03	4.5	128%	70	130	5%	
Antimony	A	mg/L	0.5373	0.5373		0.5	0.000926	0.5446	3.047E-05	0.001	18	107%	70	130	1%	
Arsenic	A	mg/L	0.5167	0.5167		0.5	0.002255	0.5297	6.629E-05	0.001	18	103%	70	130	2%	
Barium	A	mg/L	0.5356	0.5356		0.5	0.01068	0.5361	6.437E-05	0.05	18	105%	70	130	0%	
Beryllium	A	mg/L	0.2369	0.2369		0.25	0.000103	0.2332	8.97E-06	0.001	4.5	95%	70	130	2%	
Boron	A	mg/L	0.5721	0.5721		0.5	0.03376	0.5604	0.00141	0.05	4.5	108%	70	130	2%	
Cadmium	A	mg/L	0.2474	0.2474		0.25	0.000145	0.2472	1.468E-05	0.001	18	99%	70	130	0%	
Chromium	A	mg/L	0.4956	0.4956		0.5	0.001349	0.5002	5.576E-05	0.005	18	99%	70	130	1%	
Cobalt	A	mg/L	0.5051	0.5051		0.5	0.000484	0.5102	3.904E-05	0.005	18	101%	70	130	1%	
Copper	A	mg/L	0.661	0.661		0.5	0.185	0.6821	7.681E-05	0.005	4.5	95%	70	130	3%	
Lead	A	mg/L	0.5276	0.5276		0.5	0.005606	0.5196	2.956E-05	0.001	18	104%	70	130	2%	
Manganese	A	mg/L	2.558	2.558		2.5	0.0168	2.578	3.649E-05	0.001	18	102%	70	130	1%	
Mercury	A	mg/L	0.00003	0.00003		0	0.000016	0.000028	1.289E-05	0.0001	0.36	0%	0	0		
Molybdenum	A	mg/L	0.5456	0.5456		0.5	0.01429	0.541	2.302E-05	0.005	9	106%	70	130	1%	
Nickel	A	mg/L	0.5473	0.5473		0.5	0.05559	0.5539	7.128E-05	0.01	4.5	98%	70	130	1%	
Selenium	A	mg/L	0.4839	0.4839		0.5	0.000376	0.4925	0.0001532	0.001	18	97%	70	130	2%	
Silver	A	mg/L	0.05141	0.05141		0.05	0.000195	0.05126	2.959E-05	0.001	0.1	102%	70	130	0%	
Strontium	A	mg/L	0.9359	0.9359		0.5	0.431	0.9709	1.229E-05	0.01	18	101%	70	130	4%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700207	B18020772-001	200.7.8-W-DW	MSD3		2/14/2018 6:12:0	1	118509	2/14/2018 8:	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.5022	0.5022		0.5	0	0.4954	1.434E-05	0.0005	18	100%	70	130	1%	
Thorium	A	mg/L	0.5713	0.5713		0.5	0.001955	0.5636	5.767E-05	0.005	4.5	114%	70	130	1%	
Thorium 232	A	mg/L	0.5713	0.5713		0.5	0.001955	0.5636	5.767E-05	0.005	4.5	114%	70	130	1%	
Tin	A	mg/L	0.5646	0.5646		0.5	0.000279	0.5737	5.199E-05	0.05	9	113%	70	130	2%	
Titanium	A	mg/L	0.5005	0.5005		0.5	0.001879	0.5043	0.0001736	0.005	18	100%	70	130	1%	
Uranium	A	mg/L	0.5585	0.5585		0.5	0.003462	0.5508	1.332E-05	0.0003	4.5	111%	70	130	1%	
Vanadium	A	mg/L	0.5156	0.5156		0.5	0.000614	0.5135	7.351E-05	0.01	18	103%	70	130	0%	
Zinc	A	mg/L	0.6333	0.6333		0.5	0.1658	0.6484	0.0002495	0.01	4.5	94%	70	130	2%	
Uranium, Activity	C	pCi/L	374.195	374.195		0	2.31954	369.036	0.0089244	0.201	1000	0%	0	0	1%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700208	CCV	ICPMS-200.8-W CCV			2/14/2018 6:14:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.06702	0.06702		0.05	0	0	0.0002849	0.1	4.5	134%	90	110	0%	S
Antimony	A	mg/L	0.05133	0.05133		0.05	0	0	3.047E-05	0.05	18	103%	90	110	0%	
Arsenic	A	mg/L	0.04989	0.04989		0.05	0	0	6.629E-05	0.005	18	100%	90	110	0%	
Barium	A	mg/L	0.05061	0.05061		0.05	0	0	6.437E-05	0.1	18	101%	90	110	0%	
Beryllium	A	mg/L	0.04795	0.04795		0.05	0	0	8.97E-06	0.001	4.5	96%	90	110	0%	
Boron	A	mg/L	0.06275	0.06275		0.05	0	0	0.00141	0.1	4.5	125%	90	110	0%	S
Cadmium	A	mg/L	0.05117	0.05117		0.05	0	0	1.468E-05	0.001	18	102%	90	110	0%	
Cerium	A	mg/L	0.0506	0.0506		0.05	0	0	2.257E-05	0.001	4.5	101%	90	110	0%	
Chromium	A	mg/L	0.05048	0.05048		0.05	0	0	5.576E-05	0.01	18	101%	90	110	0%	
Cobalt	A	mg/L	0.05067	0.05067		0.05	0	0	3.904E-05	0.01	18	101%	90	110	0%	
Copper	A	mg/L	0.05163	0.05163		0.05	0	0	7.681E-05	0.01	4.5	103%	90	110	0%	
Iron	A	mg/L	1.347	1.347		1.3	0	0	0.000175	0.02	4.5	104%	90	110	0%	
Lanthanum	A	mg/L	0.05058	0.05058		0.05	0	0	0.0000111	0.001	4.5	101%	90	110	0%	
Lead	A	mg/L	0.05188	0.05188		0.05	0	0	2.956E-05	0.01	18	104%	90	110	0%	
Manganese	A	mg/L	0.05542	0.05542		0.05	0	0	3.649E-05	0.01	18	111%	90	110	0%	S
Mercury	A	mg/L	0.001066	0.001066		0.001	0	0	1.289E-05	0.001	0.36	107%	90	110	0%	
Molybdenum	A	mg/L	0.0516	0.0516		0.05	0	0	2.302E-05	0.005	9	103%	90	110	0%	
Nickel	A	mg/L	0.05046	0.05046		0.05	0	0	7.128E-05	0.01	4.5	101%	90	110	0%	
Selenium	A	mg/L	0.05214	0.05214		0.05	0	0	0.0001532	0.005	18	104%	90	110	0%	
Silver	A	mg/L	0.01991	0.01991		0.02	0	0	2.959E-05	0.005	1.8	100%	90	110	0%	
Strontium	A	mg/L	0.05371	0.05371		0.05	0	0	1.229E-05	0.1	18	107%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700208	CCV	ICPMS-200.8-W CCV			2/14/2018 6:14:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Thallium	A	mg/L	0.04986	0.04986		0.05	0	0	1.434E-05	0.1	18	100%	90	110	0%	
Thorium	A	mg/L	0.05058	0.05058		0.05	0	0	5.767E-05	0.001	4.5	101%	90	110	0%	
Thorium 232	A	mg/L	0.05058	0.05058		0.05	0	0	5.767E-05	0.01	4.5	101%	90	110	0%	
Tin	A	mg/L	0.05266	0.05266		0.05	0	0	5.199E-05	0.1	9	105%	90	110	0%	
Titanium	A	mg/L	0.0498	0.0498		0.05	0	0	0.0001736	0.01	18	100%	90	110	0%	
Uranium	A	mg/L	0.0517	0.0517		0.05	0	0	1.332E-05	0.001	4.5	103%	90	110	0%	
Vanadium	A	mg/L	0.05039	0.05039		0.05	0	0	7.351E-05	0.1	18	101%	90	110	0%	
Zinc	A	mg/L	0.05149	0.05149		0.05	0	0	0.0002495	0.01	4.5	103%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700209	Rinse	ICPMS-200.8-W SAMP			2/14/2018 6:17:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000663	0.000663		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000493	0.000493		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	-0.001024	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000283	0.000283		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000187	0.000187		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.00036	0.00036		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000454	0.000454		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000392	0.000392		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000486	0.000486		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.006938	0.006938		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000374	0.000374		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000443	0.000443		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000024	0.000024		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.001048	0.001048		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.00046	0.00046		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000188	0.000188		0	0	0	0.0001532	0.005	18	0%	0	0	0%	J
Silver	A	mg/L	0.000174	0.000174		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000807	0.000807		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	-0.000013	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Tin	A	mg/L	0.001552	0.001552		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000591	0.000591		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	0.000428	0.000428		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700209	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 6:17:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Vanadium	A	mg/L	0.00037	0.00037		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	0.000485	0.000485		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700210	CCB	ICPMS-200.8-W	CCB		2/14/2018 6:19:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.000777	-0.000777		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	0.000342	0.000342		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	0.000282	0.000282		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.001289	-0.001289		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000134	0.000134		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.002769	0.002769		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	0.000112	0.000112		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.00018	0.00018		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000218	0.000218		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	0.000198	0.000198		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000308	0.000308		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.007383	0.007383		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	0.000188	0.000188		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000197	0.000197		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	0.001036	0.001036		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000008	0.000008		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000461	0.000461		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	0.000254	0.000254		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000048	-0.000048		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000021	0.000021		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.00045	0.00045		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000148	-0.000148		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000394	0.000394		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000394	0.000394		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000775	0.000775		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.0004	0.0004		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000196	0.000196		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000183	0.000183		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700210	CCB	ICPMS-200.8-W	CCB		2/14/2018 6:19:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/L	0.000353	0.000353		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700211	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 6:22:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000172	0.000172		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000077	0.000077		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	-0.001406	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000128	0.000128		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000068	0.000068		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	0.000072	0.000072		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	J
Chromium	A	mg/L	0.000096	0.000096		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000078	0.000078		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	J
Copper	A	mg/L	0.000098	0.000098		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	J
Iron	A	mg/L	0.004672	0.004672		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000075	0.000075		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	J
Lead	A	mg/L	0.000058	0.000058		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	J
Mercury	A	mg/L	0.000006	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000206	0.000206		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.00017	0.00017		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	-0.00041	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000005	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000256	0.000256		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	-0.000264	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Tin	A	mg/L	0.000462	0.000462		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000136	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000073	0.000073		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	J
Vanadium	A	mg/L	0.000052	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000098	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700212	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 6:25:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000081	0.000081		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000025	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.001516	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000032	0.000032		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	0.000001	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	0.000009	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000052	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000005	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000034	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.005207	0.005207		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	0.000004	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.00002	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000008	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000059	0.000059		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000028	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000344	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000023	0		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	0.000107	0.000107		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	-0.000317	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Tin	A	mg/L	0.000267	0.000267		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000131	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	0.000002	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000049	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000015	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700213	MB-118504	200.7.8-A-N730	MBLK		2/14/2018 6:27:0	5	118504	2/14/2018 6:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	ug/filter	0.001979	0		0	0	0	4.3545	4.3545	4.5	0%	0	0	0%	
Antimony	A	ug/filter	0.000174	0		0	0	0	0.071	1	18	0%	0	0	0%	
Arsenic	A	ug/filter	-0.000115	0		0	0	0	0.07655	1	18	0%	0	0	0%	
Barium	A	ug/filter	-0.001351	0		0	0	0	0.2475	1	18	0%	0	0	0%	
Beryllium	A	ug/filter	0.000024	0		0	0	0	0.00676	1	4.5	0%	0	0	0%	
Boron	A	ug/filter	0.1302	13.02		0	0	0	12.405	12.405	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700213	MB-118504	200.7.8-A-N730	MBLK		2/14/2018 6:27:0	5	118504	2/14/2018 6:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium	A	ug/filter	0.000096	0.0096		0	0	0	0.005025	1	18	0%	0	0	0%	
Cerium	A	ug/filter	-0.000056	0		0	0	0	0.016815	1	4.5	0%	0	0	0%	
Chromium	A	ug/filter	0.002354	0		0	0	0	1.215	1.215	18	0%	0	0	0%	
Cobalt	A	ug/filter	-0.000038	0		0	0	0	0.31415	1	18	0%	0	0	0%	
Copper	A	ug/filter	0.000308	0		0	0	0	0.2953	1	4.5	0%	0	0	0%	
Lead	A	ug/filter	-0.000164	0		0	0	0	0.10225	1	18	0%	0	0	0%	
Manganese	A	ug/filter	0.000004	0		0	0	0	0.21355	1	18	0%	0	0	0%	
Mercury	A	ug/filter	0.000073	0		0	0	0	0.021325	1	0.36	0%	0	0	0%	
Molybdenum	A	ug/filter	0.000197	0		0	0	0	0.029435	1	9	0%	0	0	0%	
Nickel	A	ug/filter	0.000237	0		0	0	0	0.24515	1	4.5	0%	0	0	0%	
Selenium	A	ug/filter	-0.1824	0		0	0	0	108.2	108.2	18	0%	0	0	0%	
Silver	A	ug/filter	0.000058	0		0	0	0	0.04925	1	1.8	0%	0	0	0%	
Strontium	A	ug/filter	0.000252	0		0	0	0	0.09905	1	18	0%	0	0	0%	
Thallium	A	ug/filter	0.000081	0		0	0	0	0.0787	1	18	0%	0	0	0%	
Thorium	A	ug/filter	0.002595	0.2595		0	0	0	0.1429	1	4.5	0%	0	0	0%	
Thorium 232	A	ug/filter	0.002595	0.2595		0	0	0	0.1429	1	4.5	0%	0	0	0%	
Tin	A	ug/filter	0.001263	0.1263		0	0	0	0.05955	1	9	0%	0	0	0%	
Uranium	A	ug/filter	-0.000047	0		0	0	0	0.01106	1	4.5	0%	0	0	0%	
Vanadium	A	ug/filter	0.000059	0		0	0	0	4.8795	4.8795	18	0%	0	0	0%	
Zinc	A	ug/filter	0.002192	0		0	0	0	0.653	1	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700214	B18020915-001	200.7.8-A-N730	SAMP		2/14/2018 6:30:0	5	118504	2/14/2018 6:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Arsenic	A	ug/filter	-0.000143	0		0	0	0	0.07655	1	18	0%	0	0	0%	
Barium	A	ug/filter	-0.001313	0		0	0	0	0.2475	1	18	0%	0	0	0%	
Beryllium	A	ug/filter	0.000005	0		0	0	0	0.00676	1	4.5	0%	0	0	0%	
Cadmium	A	ug/filter	0.000141	0.0141		0	0	0	0.005025	1	18	0%	0	0	0%	J
Cobalt	A	ug/filter	-0.000084	0		0	0	0	0.31415	1	18	0%	0	0	0%	
Copper	A	ug/filter	0.002219	0		0	0	0	0.2953	1	4.5	0%	0	0	0%	
Lead	A	ug/filter	-0.000167	0		0	0	0	0.10225	1	18	0%	0	0	0%	
Mercury	A	ug/filter	0.000034	0		0	0	0	0.021325	1	0.36	0%	0	0	0%	
Molybdenum	A	ug/filter	0.000118	0		0	0	0	0.029435	1	9	0%	0	0	0%	
Nickel	A	ug/filter	0.00048	0		0	0	0	0.24515	1	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700214	B18020915-001	200.7.8-A-N730	SAMP		2/14/2018 6:30:0	5	118504	2/14/2018 6:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Silver	A	ug/filter	0.00607	0.607		0	0	0	0.04925	1	1.8	0%	0	0	0%	J
Strontium	A	ug/filter	0.00025	0		0	0	0	0.09905	1	18	0%	0	0	0%	
Thallium	A	ug/filter	-0.000236	0		0	0	0	0.0787	1	18	0%	0	0	0%	
Zinc	A	ug/filter	0.003107	0		0	0	0	0.653	1	4.5	0%	0	0	0%	
Vanadium	B	ug/filter	-0.002707	0		0	0	0	4.8795	4.8795	18	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700215	LCS-118504	200.7.8-A-N730	LCS		2/14/2018 6:33:0	5	118504	2/14/2018 6:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	ug/filter	1.347	134.7		100	0	0	4.3545	4.3545	4.5	135%	85	115	0%	S
Antimony	A	ug/filter	0.1609	16.09		20	0	0	0.071	1	18	80%	85	115	0%	S
Arsenic	A	ug/filter	0.2039	20.39		20	0	0	0.07655	1	18	102%	85	115	0%	
Barium	A	ug/filter	0.2175	21.75		20	0	0	0.2475	1	18	109%	85	115	0%	
Beryllium	A	ug/filter	0.1035	10.35		10	0	0	0.00676	1	4.5	104%	85	115	0%	
Boron	A	ug/filter	0.5462	54.62		20	13.02	0	12.405	12.405	4.5	208%	85	115	0%	S
Cadmium	A	ug/filter	0.1045	10.45		10	0.0096	0	0.005025	1	18	104%	85	115	0%	
Cerium	A	ug/filter	-0.000089	0		20	0	0	0.016815	1	4.5	0%	85	115	0%	S
Chromium	A	ug/filter	0.1995	19.95		20	0	0	1.215	1.215	18	100%	85	115	0%	
Cobalt	A	ug/filter	0.209	20.9		20	0	0	0.31415	1	18	104%	85	115	0%	
Copper	A	ug/filter	0.209	20.9		20	0	0	0.2953	1	4.5	104%	85	115	0%	
Lead	A	ug/filter	0.2118	21.18		20	0	0	0.10225	1	18	106%	85	115	0%	
Manganese	A	ug/filter	1.042	104.2		100	0	0	0.21355	1	18	104%	85	115	0%	
Mercury	A	ug/filter	0.000035	0		0	0	0	0.021325	1	0.36	0%	85	115	0%	
Molybdenum	A	ug/filter	0.1916	19.16		20	0	0	0.029435	1	9	96%	85	115	0%	
Nickel	A	ug/filter	0.207	20.7		20	0	0	0.24515	1	4.5	104%	85	115	0%	
Selenium	A	ug/filter	0.008318	0		20	0	0	108.2	108.2	18	0%	85	115	0%	S
Silver	A	ug/filter	0.1064	10.64		10	0	0	0.04925	1	1.8	106%	85	115	0%	
Strontium	A	ug/filter	0.2267	22.67		20	0	0	0.09905	1	18	113%	85	115	0%	
Thallium	A	ug/filter	0.1989	19.89		20	0	0	0.0787	1	18	99%	85	115	0%	
Thorium	A	ug/filter	0.000403	0		20	0.2595	0	0.1429	1	4.5	-1%	85	115	0%	S
Thorium 232	A	ug/filter	0.000403	0		20	0.2595	0	0.1429	1	4.5	-1%	85	115	0%	S
Tin	A	ug/filter	0.08025	8.025		20	0.1263	0	0.05955	1	9	39%	85	115	0%	S
Uranium	A	ug/filter	-0.000099	0		20	0	0	0.01106	1	4.5	0%	85	115	0%	S
Vanadium	A	ug/filter	0.2019	20.19		20	0	0	4.8795	4.8795	18	101%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700215	LCS-118504	200.7.8-A-N730	LCS		2/14/2018 6:33:0	5	118504	2/14/2018 6:	1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	ug/filter	0.2127	21.27		20	0	0	0.653	1	4.5	106%	85	115	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700216	LCSD-118504	200.7.8-A-N730	LCSD		2/14/2018 6:35:0	5	118504	2/14/2018 6:	1E+07	1E+07	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	ug/filter	1.32	132		100	0	134.7	4.3545	4.3545	4.5	132%	85	115	2%	S
Antimony	A	ug/filter	0.1576	15.76		20	0	16.09	0.071	1	18	79%	85	115	2%	S
Arsenic	A	ug/filter	0.203	20.3		20	0	20.39	0.07655	1	18	102%	85	115	0%	
Barium	A	ug/filter	0.2203	22.03		20	0	21.75	0.2475	1	18	110%	85	115	1%	
Beryllium	A	ug/filter	0.1019	10.19		10	0	10.35	0.00676	1	4.5	102%	85	115	2%	
Boron	A	ug/filter	0.2825	28.25		20	13.02	54.62	12.405	12.405	4.5	76%	85	115	64%	SR
Cadmium	A	ug/filter	0.105	10.5		10	0.0096	10.45	0.005025	1	18	105%	85	115	0%	
Cerium	A	ug/filter	-0.000101	0		20	0	0	0.016815	1	4.5	0%	85	115		S
Chromium	A	ug/filter	0.1277	12.77		20	0	19.95	1.215	1.215	18	64%	85	115	44%	SR
Cobalt	A	ug/filter	0.2068	20.68		20	0	20.9	0.31415	1	18	103%	85	115	1%	
Copper	A	ug/filter	0.2072	20.72		20	0	20.9	0.2953	1	4.5	104%	85	115	1%	
Lead	A	ug/filter	0.2071	20.71		20	0	21.18	0.10225	1	18	104%	85	115	2%	
Manganese	A	ug/filter	1.031	103.1		100	0	104.2	0.21355	1	18	103%	85	115	1%	
Mercury	A	ug/filter	0.000014	0		0	0	0	0.021325	1	0.36	0%	85	115		
Molybdenum	A	ug/filter	0.1936	19.36		20	0	19.16	0.029435	1	9	97%	85	115	1%	
Nickel	A	ug/filter	0.206	20.6		20	0	20.7	0.24515	1	4.5	103%	85	115	0%	
Selenium	A	ug/filter	0.1162	0		20	0	0	108.2	108.2	18	0%	85	115		S
Silver	A	ug/filter	0.108	10.8		10	0	10.64	0.04925	1	1.8	108%	85	115	1%	
Strontium	A	ug/filter	0.2224	22.24		20	0	22.67	0.09905	1	18	111%	85	115	2%	
Thallium	A	ug/filter	0.1987	19.87		20	0	19.89	0.0787	1	18	99%	85	115	0%	
Thorium	A	ug/filter	0.000288	0		20	0.2595	0	0.1429	1	4.5	-1%	85	115		S
Thorium 232	A	ug/filter	0.000288	0		20	0.2595	0	0.1429	1	4.5	-1%	85	115		S
Tin	A	ug/filter	0.1656	16.56		20	0.1263	8.025	0.05955	1	9	82%	85	115	69%	SR
Uranium	A	ug/filter	-0.000122	0		20	0	0	0.01106	1	4.5	0%	85	115		S
Vanadium	A	ug/filter	0.2022	20.22		20	0	20.19	4.8795	4.8795	18	101%	85	115	0%	
Zinc	A	ug/filter	0.2161	21.61		20	0	21.27	0.653	1	4.5	108%	85	115	2%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700217	B18020915-001	200.7.8-A-N730	MS		2/14/2018 6:38:0	5.1	118504		1E+07	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	ug/filter	0.06574	6.70548		5	0	0	4.44159	4.44159	4.5	134%	70	130	0%	S
Antimony	A	ug/filter	0.051	5.202		5	0	0	0.07242	1	18	104%	70	130	0%	
Arsenic	A	ug/filter	0.04701	4.79502		5	0	0	0.078081	1	18	96%	70	130	0%	
Barium	A	ug/filter	0.05003	5.10306		5	0	0	0.25245	1	18	102%	70	130	0%	
Beryllium	A	ug/filter	0.04772	4.86744		5	0	0	0.0068952	1	4.5	97%	70	130	0%	
Boron	A	ug/filter	0.1877	19.1454		5	13.73	0	12.6531	12.6531	4.5	108%	70	130	0%	
Cadmium	A	ug/filter	0.04791	4.88682		5	0.0141	0	0.0051255	1	18	97%	70	130	0%	
Cerium	A	ug/filter	0.05087	5.18874		5	0	0	0.0171513	1	4.5	104%	70	130	0%	
Chromium	A	ug/filter	0.04745	4.8399		5	0	0	1.2393	1.2393	18	97%	70	130	0%	
Cobalt	A	ug/filter	0.0471	4.8042		5	0	0	0.320433	1	18	96%	70	130	0%	
Copper	A	ug/filter	0.04833	4.92966		5	0	0	0.301206	1	4.5	99%	70	130	0%	
Lead	A	ug/filter	0.05058	5.15916		5	0	0	0.104295	1	18	103%	70	130	0%	
Manganese	A	ug/filter	0.04793	4.88886		5	0	0	0.217821	1	18	98%	70	130	0%	
Mercury	A	ug/filter	0.0011	0.1122		0.5	0	0	0.0217515	1	0.36	22%	70	130	0%	S
Molybdenum	A	ug/filter	0.04926	5.02452		5	0	0	0.0300237	1	9	100%	70	130	0%	
Nickel	A	ug/filter	0.0464	4.7328		5	0	0	0.250053	1	4.5	95%	70	130	0%	
Selenium	A	ug/filter	-0.1361	0		5	0	0	110.364	110.364	18	0%	70	130	0%	S
Silver	A	ug/filter	0.02651	2.70402		2	0.607	0	0.050235	1	1.8	105%	70	130	0%	
Strontium	A	ug/filter	0.05109	5.21118		5	0	0	0.101031	1	18	104%	70	130	0%	
Thallium	A	ug/filter	0.05011	5.11122		5	0	0	0.080274	1	18	102%	70	130	0%	
Thorium	A	ug/filter	0.05199	5.30298		5	0	0	0.145758	1	4.5	106%	70	130	0%	
Thorium 232	A	ug/filter	0.05199	5.30298		5	0	0	0.145758	1	4.5	106%	70	130	0%	
Tin	A	ug/filter	0.05224	5.32848		5	0	0	0.060741	1	9	107%	70	130	0%	
Uranium	A	ug/filter	0.0518	5.2836		5	0	0	0.0112812	1	4.5	106%	70	130	0%	
Vanadium	A	ug/filter	0.04547	0		5	0	0	4.97709	4.97709	18	0%	70	130	0%	S
Zinc	A	ug/filter	0.0527	5.3754		5	0	0	0.66606	1	4.5	108%	70	130	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700218	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 6:41:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000063	0.000063		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	0.000114	0.000114		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	J
Barium	A	mg/L	-0.001521	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.00011	0.00011		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700218	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 6:41:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Cadmium	A	mg/L	0.00003	0.00003		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	J
Cerium	A	mg/L	-0.000122	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	0.000067	0.000067		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	J
Cobalt	A	mg/L	0.000006	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	0.000019	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.009106	0.009106		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.000121	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	0.000014	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000007	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000413	0.000413		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000087	0.000087		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	J
Selenium	A	mg/L	0.000005	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000303	0.000303		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	0.000077	0.000077		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	J
Thallium	A	mg/L	-0.000172	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Tin	A	mg/L	0.000362	0.000362		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000206	0.000206		0	0	0	0.0001736	0.01	18	0%	0	0	0%	J
Uranium	A	mg/L	-0.000112	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000024	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	0.000036	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700219	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 6:43:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	-0.000059	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000003	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.001637	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000061	0.000061		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Cadmium	A	mg/L	-0.000009	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.00015	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.00004	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000071	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.0001	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.007561	0.007561		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700219	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 6:43:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Lanthanum	A	mg/L	-0.000142	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000129	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000004	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000106	0.000106		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	-0.000057	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000267	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000104	0.000104		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	-0.000018	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000367	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Tin	A	mg/L	0.000046	0		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	0.000037	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000149	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000032	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000098	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700220	MB-118455	ICPMS-6020-S-	MBLK		2/14/2018 6:46:0	2	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	-0.000915	0		0	0	0	0.6864	5	5	0%	0	0	0%	
Antimony	A	mg/kg	0.000439	0.0439		0	0	0	0.011164	1	5	0%	0	0	0%	
Arsenic	A	mg/kg	-0.000506	0		0	0	0	0.03342	1	5	0%	0	0	0%	
Barium	A	mg/kg	-0.0016	0		0	0	0	0.013238	1	5	0%	0	0	0%	
Beryllium	A	mg/kg	0.000017	0		0	0	0	0.003436	1	5	0%	0	0	0%	
Boron	A	mg/kg	0.001804	0.1804		0	0	0	0.0848	1	5	0%	0	0	0%	
Cadmium	A	mg/kg	-0.000111	0		0	0	0	0.004746	1	5	0%	0	0	0%	
Chromium	A	mg/kg	0.002395	0.2395		0	0	0	0.11824	1	5	0%	0	0	0%	
Cobalt	A	mg/kg	-0.000177	0		0	0	0	0.003824	1	5	0%	0	0	0%	
Copper	A	mg/kg	0.000277	0		0	0	0	0.06682	1	5	0%	0	0	0%	
Lead	A	mg/kg	0.00018	0		0	0	0	0.04464	1	5	0%	0	0	0%	
Manganese	A	mg/kg	-0.000305	0		0	0	0	0.0479	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg	0.000161	0.0161		0	0	0	0.009372	1	5	0%	0	0	0%	
Nickel	A	mg/kg	0.000108	0		0	0	0	0.017344	1	5	0%	0	0	0%	
Selenium	A	mg/kg	-0.000104	0		0	0	0	0.03788	1	5	0%	0	0	0%	
Silver	A	mg/kg	0.000881	0.0881		0	0	0	0.010724	1	0.25	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700220	MB-118455	ICPMS-6020-S-	MBLK		2/14/2018 6:46:0	2	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium	A	mg/kg	0.000018	0		0	0	0	0.005114	1	5	0%	0	0	0%	
Thallium	A	mg/kg	0.001541	0.1541		0	0	0	0.004758	1	5	0%	0	0	0%	
Thorium	A	mg/kg	0.004615	0.4615		0	0	0	0.03388	1	5	0%	0	0	0%	
Tin	A	mg/kg	0.018	1.8		0	0	0	0.08568	1	5	0%	0	0	0%	
Titanium	A	mg/kg	0.000553	0.0553		0	0	0	0.0391	1	5	0%	0	0	0%	
Uranium	A	mg/kg	-0.000141	0		0	0	0	0.001281	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	-0.000756	0		0	0	0	0.1674	1	5	0%	0	0	0%	
Zinc	A	mg/kg	0.001057	0		0	0	0	0.2444	1	5	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	-0.0000253	0		0	0	0	0.001671	0.05	0	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L	-0.00008	0		0	0	0	0.0006619	0.05	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	-5.55E-06	0		0	0	0	0.0002373	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.00011975	0.011975		0	0	0	0.005912	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	0.000009	0		0	0	0	0.002232	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	-0.0000052	0		0	0	0	0.001894	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.00004405	0.004405		0	0	0	0.0005362	0.05	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700221	CCV	ICPMS-200.8-W	CCV		2/14/2018 6:49:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.06039	0.06039		0.05	0	0	0.0002849	0.1	4.5	121%	90	110	0%	S
Antimony	A	mg/L	0.05062	0.05062		0.05	0	0	3.047E-05	0.05	18	101%	90	110	0%	
Arsenic	A	mg/L	0.04846	0.04846		0.05	0	0	6.629E-05	0.005	18	97%	90	110	0%	
Barium	A	mg/L	0.05074	0.05074		0.05	0	0	6.437E-05	0.1	18	101%	90	110	0%	
Beryllium	A	mg/L	0.0476	0.0476		0.05	0	0	8.97E-06	0.001	4.5	95%	90	110	0%	
Boron	A	mg/L	0.05262	0.05262		0.05	0	0	0.00141	0.1	4.5	105%	90	110	0%	
Cadmium	A	mg/L	0.05048	0.05048		0.05	0	0	1.468E-05	0.001	18	101%	90	110	0%	
Cerium	A	mg/L	0.0509	0.0509		0.05	0	0	2.257E-05	0.001	4.5	102%	90	110	0%	
Chromium	A	mg/L	0.04672	0.04672		0.05	0	0	5.576E-05	0.01	18	93%	90	110	0%	
Cobalt	A	mg/L	0.04835	0.04835		0.05	0	0	3.904E-05	0.01	18	97%	90	110	0%	
Copper	A	mg/L	0.04933	0.04933		0.05	0	0	7.681E-05	0.01	4.5	99%	90	110	0%	
Iron	A	mg/L	1.272	1.272		1.3	0	0	0.000175	0.02	4.5	98%	90	110	0%	
Lanthanum	A	mg/L	0.05013	0.05013		0.05	0	0	0.0000111	0.001	4.5	100%	90	110	0%	
Lead	A	mg/L	0.05096	0.05096		0.05	0	0	2.956E-05	0.01	18	102%	90	110	0%	
Manganese	A	mg/L	0.04906	0.04906		0.05	0	0	3.649E-05	0.01	18	98%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700221	CCV	ICPMS-200.8-W CCV			2/14/2018 6:49:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Mercury	A	mg/L	0.001092	0.001092		0.001	0	0	1.289E-05	0.001	0.36	109%	90	110	0%	
Molybdenum	A	mg/L	0.04686	0.04686		0.05	0	0	2.302E-05	0.005	9	94%	90	110	0%	
Nickel	A	mg/L	0.04796	0.04796		0.05	0	0	7.128E-05	0.01	4.5	96%	90	110	0%	
Selenium	A	mg/L	0.05008	0.05008		0.05	0	0	0.0001532	0.005	18	100%	90	110	0%	
Silver	A	mg/L	0.01827	0.01827		0.02	0	0	2.959E-05	0.005	1.8	91%	90	110	0%	
Strontium	A	mg/L	0.05255	0.05255		0.05	0	0	1.229E-05	0.1	18	105%	90	110	0%	
Thallium	A	mg/L	0.05044	0.05044		0.05	0	0	1.434E-05	0.1	18	101%	90	110	0%	
Thorium	A	mg/L	0.04258	0.04258		0.05	0	0	5.767E-05	0.001	4.5	85%	90	110	0%	S
Thorium 232	A	mg/L	0.04258	0.04258		0.05	0	0	5.767E-05	0.01	4.5	85%	90	110	0%	S
Tin	A	mg/L	0.05006	0.05006		0.05	0	0	5.199E-05	0.1	9	100%	90	110	0%	
Titanium	A	mg/L	0.04633	0.04633		0.05	0	0	0.0001736	0.01	18	93%	90	110	0%	
Uranium	A	mg/L	0.05122	0.05122		0.05	0	0	1.332E-05	0.001	4.5	102%	90	110	0%	
Vanadium	A	mg/L	0.04686	0.04686		0.05	0	0	7.351E-05	0.1	18	94%	90	110	0%	
Zinc	A	mg/L	0.05032	0.05032		0.05	0	0	0.0002495	0.01	4.5	101%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700222	Rinse	ICPMS-200.8-W SAMP			2/14/2018 6:51:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Antimony	A	mg/L	0.000062	0.000062		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	J
Arsenic	A	mg/L	-0.000093	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.001691	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000056	0.000056		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	0.000479	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000013	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000126	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000023	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000147	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.00015	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.005944	0.005944		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	J
Lanthanum	A	mg/L	-0.000128	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.00007	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000606	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000011	0		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000305	0.000305		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700222	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 6:51:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	A	mg/L	-0.000088	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.00025	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000081	0.000081		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	-0.000084	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000238	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Tin	A	mg/L	0.000685	0.000685		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	0.000063	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000106	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000092	0		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000153	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700223	CCB	ICPMS-200.8-W	CCB		2/14/2018 6:54:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.004065	-0.004065		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000065	-0.000065		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000135	-0.000135		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.00176	-0.00176		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	-0.000013	-0.000013		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	0.000049	0.000049		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000055	-0.000055		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000148	-0.000148		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000142	-0.000142		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000144	-0.000144		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000117	-0.000117		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	0.00499	0.00499		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	-0.000151	-0.000151		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000148	-0.000148		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.000761	-0.000761		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000012	0.000012		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	0.000002	0.000002		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000104	-0.000104		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000307	-0.000307		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000021	-0.000021		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700223	CCB	ICPMS-200.8-W	CCB		2/14/2018 6:54:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Strontium	A	mg/L	-0.000111	-0.000111		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000346	-0.000346		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	0.000026	0.000026		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	0.000026	0.000026		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000166	0.000166		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000026	-0.000026		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000144	-0.000144		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	-0.000094	-0.000094		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000059	-0.000059		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700224	MB-118046	ICPMS-6020-S-	MBLK		2/14/2018 6:57:0	2	118046	1/31/2018 7:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/kg	0.000982	0		0	0	0	0.6864	5	5	0%	0	0	0%	
Antimony	A	mg/kg	0.0004	0.04		0	0	0	0.011164	1	5	0%	0	0	0%	
Arsenic	A	mg/kg	-0.000521	0		0	0	0	0.03342	1	5	0%	0	0	0%	
Barium	A	mg/kg	-0.001671	0		0	0	0	0.013238	1	5	0%	0	0	0%	
Beryllium	A	mg/kg	-0.000017	0		0	0	0	0.003436	1	5	0%	0	0	0%	
Boron	A	mg/kg	0.000263	0		0	0	0	0.0848	1	5	0%	0	0	0%	
Cadmium	A	mg/kg	-0.000117	0		0	0	0	0.004746	1	5	0%	0	0	0%	
Chromium	A	mg/kg	0.001951	0.1951		0	0	0	0.11824	1	5	0%	0	0	0%	
Cobalt	A	mg/kg	-0.000233	0		0	0	0	0.003824	1	5	0%	0	0	0%	
Copper	A	mg/kg	0.000218	0		0	0	0	0.06682	1	5	0%	0	0	0%	
Lead	A	mg/kg	-0.000086	0		0	0	0	0.04464	1	5	0%	0	0	0%	
Manganese	A	mg/kg	-0.000706	0		0	0	0	0.0479	1	5	0%	0	0	0%	
Molybdenum	A	mg/kg	0.000066	0		0	0	0	0.009372	1	5	0%	0	0	0%	
Nickel	A	mg/kg	0.000017	0		0	0	0	0.017344	1	5	0%	0	0	0%	
Selenium	A	mg/kg	-0.00018	0		0	0	0	0.03788	1	5	0%	0	0	0%	
Silver	A	mg/kg	0.000554	0.0554		0	0	0	0.010724	1	0.25	0%	0	0	0%	
Strontium	A	mg/kg	-0.000077	0		0	0	0	0.005114	1	5	0%	0	0	0%	
Thallium	A	mg/kg	0.000712	0.0712		0	0	0	0.004758	1	5	0%	0	0	0%	
Thorium	A	mg/kg	0.005435	0.5435		0	0	0	0.03388	1	5	0%	0	0	0%	
Tin	A	mg/kg	0.01573	1.573		0	0	0	0.08568	1	5	0%	0	0	0%	
Titanium	A	mg/kg	0.000803	0.0803		0	0	0	0.0391	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700224	MB-118046	ICPMS-6020-S-	MBLK		2/14/2018 6:57:0	2	118046	1/31/2018 7:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Uranium	A	mg/kg	-0.000144	0		0	0	0	0.001281	1	5	0%	0	0	0%	
Vanadium	A	mg/kg	-0.000692	0		0	0	0	0.1674	1	5	0%	0	0	0%	
Zinc	A	mg/kg	0.001676	0		0	0	0	0.2444	1	5	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	C	mg/L	-2.605E-05	0		0	0	0	0.001671	0.05	0	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L	-8.355E-05	0		0	0	0	0.0006619	0.05	0	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	C	mg/L	-5.85E-06	0		0	0	0	0.0002373	0.05	0	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	C	mg/L	0.00009755	0.009755		0	0	0	0.005912	0.05	0	0%	0	0	0%	
Lead, TCLP equivalent (calc)	C	mg/L	-0.0000043	0		0	0	0	0.002232	0.05	0	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	C	mg/L	-0.000009	0		0	0	0	0.001894	0.05	0	0%	0	0	0%	
Silver, TCLP equivalent (calc)	C	mg/L	0.0000277	0.00277		0	0	0	0.0005362	0.05	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700225	B18011365-002	6010.20-S	SAMP		2/14/2018 6:59:0	5	118046	1/31/2018 7:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/kg	0.001225	0		0	0	0	0.3028116	0.5	5	0%	0	0	0%	
Antimony	B	mg/kg	0.000019	0		0	0	0	0.0138322	0.5	5	0%	0	0	0%	
Arsenic	B	mg/kg	0.000295	0		0	0	0	0.0414074	0.5	5	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	B	mg/L	0.00001475	0		0	0	0	0.0020704	0.025	0	0%	0	0	0%	
Barium	B	mg/kg	0.0124	1.53636		0	0	0	0.0164019	0.5	5	0%	0	0	0%	
Barium as BaO	B	mg/kg	0.013888	1.7207232		0	0	0	0.0183701	0.56	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L		0.07681308		0	0	0	0.0008200	0.0249984	0	0%	0	0	0%	D
Beryllium	B	mg/kg	0.000003	0		0	0	0	0.0042572	0.5	5	0%	0	0	0%	
Boron	B	mg/kg	0.008502	1.0533978		0	0	0	0.1050672	0.5	5	0%	0	0	0%	
Cadmium	B	mg/kg	-0.000635	0		0	0	0	0.0085367	0.5	5	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	B	mg/L	-3.175E-05	0		0	0	0	0.0004268	0.025	0	0%	0	0	0%	
Chromium	B	mg/kg	0.000579	0		0	0	0	0.1464994	0.5	5	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	B	mg/L	0.00002895	0		0	0	0	0.007325	0.025	0	0%	0	0	0%	
Cobalt	B	mg/kg	-0.000088	0		0	0	0	0.0047379	0.5	5	0%	0	0	0%	
Copper	B	mg/kg	0.000086	0		0	0	0	0.08279	0.5	5	0%	0	0	0%	
Lead	B	mg/kg	0.0003	0		0	0	0	0.055309	0.5	5	0%	0	0	0%	
Lead, TCLP equivalent (calc)	B	mg/L	0.000015	0		0	0	0	0.0027654	0.025	0	0%	0	0	0%	
Manganese	B	mg/kg	0.001059	0.1312101		0	0	0	0.0593481	0.5	5	0%	0	0	0%	J
Manganese as MnO	B	mg/kg	0.00134493	0.16663683		0	0	0	0.0753721	0.635	100000	0%	0	0	0%	J
Molybdenum	B	mg/kg	0.004328	0.5362392		0	0	0	0.0116119	0.5	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700225	B18011365-002	6010.20-S	SAMP		2/14/2018 6:59:0	5	118046	1/31/2018 7:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	B	mg/kg	0.001212	0.1501668		0	0	0	0.0214892	0.5	5	0%	0	0	0%	J
Selenium	B	mg/kg	-0.001269	0		0	0	0	0.0469333	0.5	5	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	B	mg/L	-6.345E-05	0		0	0	0	0.0023467	0.025	0	0%	0	0	0%	
Silver	B	mg/kg	-0.000004	0		0	0	0	0.0132870	0.5	1	0%	0	0	0%	
Silver, TCLP equivalent (calc)	B	mg/L	-0.0000002	0		0	0	0	0.0006644	0.025	0	0%	0	0	0%	
Strontium	B	mg/kg	0.001644	0.2036916		0	0	0	0.0063362	5	5	0%	0	0	0%	J
Strontium as SrO	B	mg/kg	0.00193992	0.24035609		0	0	0	0.0074768	5.9	100000	0%	0	0	0%	J
Thallium	B	mg/kg	0.000855	0.1059345		0	0	0	0.0058952	5	5	0%	0	0	0%	J
Titanium	B	mg/kg	0.00403	0.499317		0	0	0	0.0484449	5	5	0%	0	0	0%	J
Titanium as TiO2	B	mg/kg	0.0067301	0.83385939		0	0	0	0.080903	8.35	100000	0%	0	0	0%	J
Uranium	B	mg/kg	0.000176	0.0218064		0	0	0	0.0015872	5	5	0%	0	0	0%	J
Uranium, Activity	B	pCi/g	0.00011915	0.01476293		0	0	0	0.0010745	3.385	3	0%	0	0	0%	J
Vanadium	B	mg/kg	0.000608	0		0	0	0	0.2074086	0.5	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700226	B18020272-013	ICPMS-6020-S-	SAMP		2/14/2018 7:02:0	5	118455	2/13/2018 8:	0	0	2.120729

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/kg-dr	2.309	577.961999		0	0	0	0.0331358	10	5	0%	0	0	0%	
Boron	A	mg/kg-dr	0.3558	89.0597139		0	0	0	0.2122615	48	5	0%	0	0	0%	
Manganese	A	mg/kg-dr	3.899	975.952289		0	0	0	0.1198977	10	5	0%	0	0	0%	
Antimony	B	mg/kg-dr	0.08658	21.6716977		0	0	0	0.0279444	8	5	0%	0	0	0%	
Arsenic	B	mg/kg-dr	0.5228	130.86121		0	0	0	0.0836531	4	5	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	B	mg/L-dry	0.02614	6.54306049		0	0	0	0.0041827	0.2	0	0%	0	0	0%	*
Barium, TCLP equivalent (calc)	B	mg/L-dry	0.11545	28.8981		0	0	0	0.0016568	0.5	0	0%	0	0	0%	
Beryllium	B	mg/kg-dr	0.835	209.007479		0	0	0	0.0086006	4	5	0%	0	0	0%	
Cadmium	B	mg/kg-dr	0.4138	103.577599		0	0	0	0.0118796	4	5	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	B	mg/L-dry	0.02069	5.17887993		0	0	0	0.000594	0.2	0	0%	0	0	0%	*
Chromium	B	mg/kg-dr	0.4597	115.066752		0	0	0	0.2959646	4	5	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	B	mg/L-dry	0.022985	5.75333762		0	0	0	0.0147982	0.2	0	0%	0	0	0%	*
Cobalt	B	mg/kg-dr	0.5415	135.541976		0	0	0	0.0095718	4	5	0%	0	0	0%	
Copper	B	mg/kg-dr	0.3441	86.1311061		0	0	0	0.1672560	4	5	0%	0	0	0%	
Lead	B	mg/kg-dr	1.174	293.862013		0	0	0	0.1117377	4	5	0%	0	0	0%	
Lead, TCLP equivalent (calc)	B	mg/L-dry	0.0587	14.6931006		0	0	0	0.0055869	0.2	0	0%	0	0	0%	*
Molybdenum	B	mg/kg-dr	0.4046	101.274762		0	0	0	0.0234589	3	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700226	B18020272-013	ICPMS-6020-S-	SAMP		2/14/2018 7:02:0	5	118455	2/13/2018 8:	0	0	2.120729

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Nickel	B	mg/kg-dr	0.4387	109.810277		0	0	0	0.0434135	4	5	0%	0	0	0%	
Selenium	B	mg/kg-dr	0.9889	247.529936		0	0	0	0.0948168	4	5	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	B	mg/L-dry	0.049445	12.3764968		0	0	0	0.0047408	0.2	0	0%	0	0	0%	*
Strontium	B	mg/kg-dr	0.6378	159.646671		0	0	0	0.0128008	4	5	0%	0	0	0%	
Thallium	B	mg/kg-dr	0.7617	190.659877		0	0	0	0.0119097	4	5	0%	0	0	0%	
Tin	B	mg/kg-dr	0.6267	156.868248		0	0	0	0.2144642	7.5	5	0%	0	0	0%	
Titanium	B	mg/kg-dr	0.3095	77.4704369		0	0	0	0.0978706	1	5	0%	0	0	0%	
Uranium	B	mg/kg-dr	0.005221	1.30685994		0	0	0	0.0032065	1	5	0%	0	0	0%	
Vanadium	B	mg/kg-dr	0.574	143.676998		0	0	0	0.4190162	4	5	0%	0	0	0%	
Zinc	B	mg/kg-dr	2.235	559.439181		0	0	0	0.6117536	10	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700227	B18020743-001	6010.20-S	SAMP		2/14/2018 7:05:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/kg	0.00395	0.9517525		0	0	0	0.031897	1	5	0%	0	0	0%	J
Boron	A	mg/kg	0.005261	1.26763795		0	0	0	0.2043256	1	5	0%	0	0	0%	
Titanium	A	mg/kg	0.02683	6.4646885		0	0	0	0.0942115	1	5	0%	0	0	0%	
Zinc	A	mg/kg	0.01053	2.5372035		0	0	0	0.5888818	1	5	0%	0	0	0%	
Antimony	B	mg/kg	0.000154	0.0371063		0	0	0	0.0268997	1	5	0%	0	0	0%	J
Arsenic	B	mg/kg	0.001297	0.31251215		0	0	0	0.0805255	1	5	0%	0	0	0%	J
Arsenic, TCLP equivalent (calc)	B	mg/L	0.00006485	0.01562561		0	0	0	0.0040263	0.05	0	0%	0	0	0%	J
Beryllium	B	mg/kg	0.000566	0.1363777		0	0	0	0.0082790	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg	0.000299	0.07204405		0	0	0	0.0166015	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L	0.00001495	0.00360220		0	0	0	0.0008301	0.05	0	0%	0	0	0%	J
Chromium	B	mg/kg	0.00338	0.814411		0	0	0	0.2848993	1	5	0%	0	0	0%	J
Chromium, TCLP equivalent (calc)	B	mg/L	0.000169	0.04072055		0	0	0	0.014245	0.05	0	0%	0	0	0%	J
Cobalt	B	mg/kg	0.002534	0.6105673		0	0	0	0.0092139	1	5	0%	0	0	0%	J
Copper	B	mg/kg	0.000593	0		0	0	0	0.1610028	1	5	0%	0	0	0%	
Lead	B	mg/kg	0.001424	0.3431128		0	0	0	0.1075601	1	5	0%	0	0	0%	J
Lead, TCLP equivalent (calc)	B	mg/L	0.0000712	0.01715564		0	0	0	0.0053780	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg	0.004748	1.1440306		0	0	0	0.1154151	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg	0.00602996	1.45291886		0	0	0	0.1465771	1.27	100000	0%	0	0	0%	
Molybdenum	B	mg/kg	0.06341	15.2786395		0	0	0	0.0225818	1	5	0%	0	0	0%	
Nickel	B	mg/kg	0.7407	178.471665		0	0	0	0.0417904	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700227	B18020743-001	6010.20-S	SAMP		2/14/2018 7:05:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Selenium	B	mg/kg	-0.000632	0		0	0	0	0.0912719	1	5	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	B	mg/L	-0.0000316	0		0	0	0	0.0045636	0.05	0	0%	0	0	0%	
Silver	B	mg/kg	0.000552	0.1330044		0	0	0	0.0258395	1	1	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	B	mg/L	0.0000276	0.00665022		0	0	0	0.001292	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg	0.002398	0.5777981		0	0	0	0.0123222	1	5	0%	0	0	0%	J
Strontium as SrO	B	mg/kg	0.00282964	0.68180176		0	0	0	0.0145402	1.18	100000	0%	0	0	0%	J
Thallium	B	mg/kg	0.001391	0.33516145		0	0	0	0.0114644	1	5	0%	0	0	0%	J
Titanium as TiO2	B	mg/kg	0.0448061	10.7960298		0	0	0	0.1573331	1.67	100000	0%	0	0	0%	
Uranium	B	mg/kg	-0.000138	0		0	0	0	0.0030866	1	5	0%	0	0	0%	
Uranium, Activity	B	pCi/g	-9.343E-05	0		0	0	0	0.0020896	0.677	3	0%	0	0	0%	
Vanadium	B	mg/kg	1.891	455.63645		0	0	0	0.4033503	1	5	0%	0	0	0%	
Barium as BaO	C	mg/kg	0.004424	1.0659628		0	0	0	0.0357246	1.12	100000	0%	0	0	0%	J
Barium, TCLP equivalent (calc)	C	mg/L		0.04758458		0	0	0	0.0015947	0.0499968	0	0%	0	0	0%	DJ

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700228	B18020743-002	6010.20-S	SAMP		2/14/2018 7:07:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/kg	0.02723	6.7843545		0	0	0	0.0329825	1	5	0%	0	0	0%	
Beryllium	A	mg/kg	0.000378	0.0941787		0	0	0	0.0085608	1	5	0%	0	0	0%	J
Boron	A	mg/kg	0.002939	0.73225185		0	0	0	0.2112792	1	5	0%	0	0	0%	J
Zinc	A	mg/kg	0.006073	1.51308795		0	0	0	0.6089226	1	5	0%	0	0	0%	
Antimony	B	mg/kg	0.000039	0		0	0	0	0.0278151	1	5	0%	0	0	0%	
Arsenic	B	mg/kg	0.000783	0.19508445		0	0	0	0.0832659	1	5	0%	0	0	0%	J
Arsenic, TCLP equivalent (calc)	B	mg/L	0.00003915	0.00975422		0	0	0	0.0041633	0.05	0	0%	0	0	0%	J
Cadmium	B	mg/kg	0.000193	0.04808595		0	0	0	0.0171664	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L	0.00000965	0.0024043		0	0	0	0.0008583	0.05	0	0%	0	0	0%	J
Chromium	B	mg/kg	0.004646	1.1575509		0	0	0	0.294595	1	5	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	B	mg/L	0.0002323	0.05787755		0	0	0	0.0147297	0.05	0	0%	0	0	0%	
Cobalt	B	mg/kg	0.002211	0.55087065		0	0	0	0.0095275	1	5	0%	0	0	0%	J
Copper	B	mg/kg	0.00055	0		0	0	0	0.1664820	1	5	0%	0	0	0%	
Lead	B	mg/kg	0.000557	0.13877655		0	0	0	0.1112206	1	5	0%	0	0	0%	J
Lead, TCLP equivalent (calc)	B	mg/L	0.00002785	0.00693883		0	0	0	0.0055610	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg	0.006871	1.71190965		0	0	0	0.1193429	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg	0.00872617	2.17412526		0	0	0	0.1515654	1.27	100000	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700228	B18020743-002	6010.20-S	SAMP		2/14/2018 7:07:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Molybdenum	B	mg/kg	0.06484	16.154886		0	0	0	0.0233503	1	5	0%	0	0	0%	
Nickel	B	mg/kg	0.4537	113.039355		0	0	0	0.0432126	1	5	0%	0	0	0%	
Selenium	B	mg/kg	-0.000746	0		0	0	0	0.0943780	1	5	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	B	mg/L	-0.0000373	0		0	0	0	0.0047189	0.05	0	0%	0	0	0%	
Silver	B	mg/kg	0.000214	0.0533181		0	0	0	0.0267188	1	1	0%	0	0	0%	J
Silver, TCLP equivalent (calc)	B	mg/L	0.0000107	0.00266591		0	0	0	0.0013359	0.05	0	0%	0	0	0%	J
Strontium	B	mg/kg	0.001627	0.40536705		0	0	0	0.0127415	1	5	0%	0	0	0%	J
Strontium as SrO	B	mg/kg	0.00191986	0.47833312		0	0	0	0.0150350	1.18	100000	0%	0	0	0%	J
Thallium	B	mg/kg	0.00039	0.0971685		0	0	0	0.0118546	1	5	0%	0	0	0%	J
Titanium	B	mg/kg	0.02518	6.273597		0	0	0	0.0974177	1	5	0%	0	0	0%	
Titanium as TiO2	B	mg/kg	0.0420506	10.476907		0	0	0	0.1626875	1.67	100000	0%	0	0	0%	
Uranium	B	mg/kg	-0.000071	0		0	0	0	0.0031916	1	5	0%	0	0	0%	
Uranium, Activity	B	pCi/g	-4.807E-05	0		0	0	0	0.0021607	0.677	3	0%	0	0	0%	
Vanadium	B	mg/kg	1.072	267.0888		0	0	0	0.4170771	1	5	0%	0	0	0%	
Barium as BaO	C	mg/kg	0.0304976	7.59847704		0	0	0	0.0369404	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	C	mg/L		0.33919602		0	0	0	0.0016490	0.0499968	0	0%	0	0	0%	D

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700229	B18020746-001	6010.20-S	SAMP		2/14/2018 7:10:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/kg	0.01406	3.496722		0	0	0	0.6078228	1	5	0%	0	0	0%	
Antimony	B	mg/kg	0.000022	0		0	0	0	0.0277649	1	5	0%	0	0	0%	
Arsenic	B	mg/kg	0.000109	0		0	0	0	0.0831155	1	5	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	B	mg/L	0.00000545	0		0	0	0	0.0041558	0.05	0	0%	0	0	0%	
Barium	B	mg/kg	0.006921	1.7212527		0	0	0	0.0329229	1	5	0%	0	0	0%	
Barium as BaO	B	mg/kg	0.00775152	1.92780302		0	0	0	0.0368737	1.12	100000	0%	0	0	0%	
Barium, TCLP equivalent (calc)	B	mg/L		0.08605713		0	0	0	0.0016460	0.0499968	0	0%	0	0	0%	D
Beryllium	B	mg/kg	0.00015	0.037305		0	0	0	0.0085453	1	5	0%	0	0	0%	J
Boron	B	mg/kg	0.000927	0.2305449		0	0	0	0.2108976	1	5	0%	0	0	0%	J
Cadmium	B	mg/kg	0.000087	0.0216369		0	0	0	0.0171354	1	5	0%	0	0	0%	J
Cadmium, TCLP equivalent (calc)	B	mg/L	0.00000435	0.00108185		0	0	0	0.0008568	0.05	0	0%	0	0	0%	J
Chromium	B	mg/kg	0.00499	1.241013		0	0	0	0.2940629	1	5	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	B	mg/L	0.0002495	0.06205065		0	0	0	0.0147031	0.05	0	0%	0	0	0%	
Cobalt	B	mg/kg	0.000691	0.1718517		0	0	0	0.0095103	1	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700229	B18020746-001	6010.20-S	SAMP		2/14/2018 7:10:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Copper	B	mg/kg	0.008031	1.9973097		0	0	0	0.1661813	1	5	0%	0	0	0%	
Lead	B	mg/kg	0.000643	0.1599141		0	0	0	0.1110197	1	5	0%	0	0	0%	J
Lead, TCLP equivalent (calc)	B	mg/L	0.00003215	0.00799571		0	0	0	0.005551	0.05	0	0%	0	0	0%	J
Manganese	B	mg/kg	0.04175	10.383225		0	0	0	0.1191273	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg	0.0530225	13.1866958		0	0	0	0.1512917	1.27	100000	0%	0	0	0%	
Molybdenum	B	mg/kg	0.01387	3.449469		0	0	0	0.0233082	1	5	0%	0	0	0%	
Nickel	B	mg/kg	0.1138	28.30206		0	0	0	0.0431345	1	5	0%	0	0	0%	
Selenium	B	mg/kg	-0.000881	0		0	0	0	0.0942076	1	5	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	B	mg/L	-4.405E-05	0		0	0	0	0.0047104	0.05	0	0%	0	0	0%	
Silver	B	mg/kg	0.000103	0		0	0	0	0.0266706	1	1	0%	0	0	0%	
Silver, TCLP equivalent (calc)	B	mg/L	0.00000515	0		0	0	0	0.0013335	0.05	0	0%	0	0	0%	
Strontium	B	mg/kg	0.00194	0.482478		0	0	0	0.0127185	1	5	0%	0	0	0%	J
Strontium as SrO	B	mg/kg	0.0022892	0.56932404		0	0	0	0.0150079	1.18	100000	0%	0	0	0%	J
Thallium	B	mg/kg	0.00015	0.037305		0	0	0	0.0118331	1	5	0%	0	0	0%	J
Titanium	B	mg/kg	0.006518	1.6210266		0	0	0	0.0972417	1	5	0%	0	0	0%	
Titanium as TiO2	B	mg/kg	0.01088506	2.70711442		0	0	0	0.1623936	1.67	100000	0%	0	0	0%	
Uranium	B	mg/kg	-0.000158	0		0	0	0	0.0031858	1	5	0%	0	0	0%	
Uranium, Activity	B	pCi/g	-0.000107	0		0	0	0	0.0021568	0.677	3	0%	0	0	0%	
Vanadium	B	mg/kg	0.3123	77.66901		0	0	0	0.4163238	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700230	B18020746-002	6010.20-S	SAMP		2/14/2018 7:13:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/kg	0.006984	1.6925724		0	0	0	0.5923034	1	5	0%	0	0	0%	
Antimony	B	mg/kg	-0.000032	0		0	0	0	0.027056	1	5	0%	0	0	0%	
Arsenic	B	mg/kg	-0.000046	0		0	0	0	0.0809934	1	5	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	B	mg/L	-0.0000023	0		0	0	0	0.0040497	0.05	0	0%	0	0	0%	
Barium	B	mg/kg	0.001706	0.4134491		0	0	0	0.0320823	1	5	0%	0	0	0%	J
Barium as BaO	B	mg/kg	0.00191072	0.46306299		0	0	0	0.0359322	1.12	100000	0%	0	0	0%	J
Barium, TCLP equivalent (calc)	B	mg/L		0.02067113		0	0	0	0.0016040	0.0499968	0	0%	0	0	0%	DJ
Beryllium	B	mg/kg	0.000169	0.04095715		0	0	0	0.0083271	1	5	0%	0	0	0%	J
Boron	B	mg/kg	-0.000034	0		0	0	0	0.2055128	1	5	0%	0	0	0%	
Cadmium	B	mg/kg	0.000057	0		0	0	0	0.0166979	1	5	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	B	mg/L	0.00000285	0		0	0	0	0.0008349	0.05	0	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700230	B18020746-002	6010.20-S	SAMP		2/14/2018 7:13:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Chromium	B	mg/kg	0.001571	0.38073185		0	0	0	0.2865546	1	5	0%	0	0	0%	J
Chromium, TCLP equivalent (calc)	B	mg/L	0.00007855	0.01903659		0	0	0	0.0143277	0.05	0	0%	0	0	0%	J
Cobalt	B	mg/kg	0.000154	0.0373219		0	0	0	0.0092675	1	5	0%	0	0	0%	J
Copper	B	mg/kg	0.002	0.4847		0	0	0	0.1619383	1	5	0%	0	0	0%	J
Lead	B	mg/kg	0.000184	0		0	0	0	0.1081850	1	5	0%	0	0	0%	
Lead, TCLP equivalent (calc)	B	mg/L	0.0000092	0		0	0	0	0.0054093	0.05	0	0%	0	0	0%	
Manganese	B	mg/kg	0.005307	1.28615145		0	0	0	0.1160857	1	5	0%	0	0	0%	
Manganese as MnO	B	mg/kg	0.00673989	1.63341234		0	0	0	0.1474288	1.27	100000	0%	0	0	0%	
Molybdenum	B	mg/kg	0.007624	1.8476764		0	0	0	0.0227130	1	5	0%	0	0	0%	
Nickel	B	mg/kg	0.07429	18.0041815		0	0	0	0.0420332	1	5	0%	0	0	0%	
Selenium	B	mg/kg	-0.0006	0		0	0	0	0.0918022	1	5	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	B	mg/L	-0.00003	0		0	0	0	0.0045901	0.05	0	0%	0	0	0%	
Silver	B	mg/kg	0.000056	0		0	0	0	0.0259896	1	1	0%	0	0	0%	
Silver, TCLP equivalent (calc)	B	mg/L	0.0000028	0		0	0	0	0.0012995	0.05	0	0%	0	0	0%	
Strontium	B	mg/kg	0.001336	0.3237796		0	0	0	0.0123938	1	5	0%	0	0	0%	J
Strontium as SrO	B	mg/kg	0.00157648	0.38205993		0	0	0	0.0146247	1.18	100000	0%	0	0	0%	J
Thallium	B	mg/kg	0.000053	0.01284455		0	0	0	0.0115310	1	5	0%	0	0	0%	J
Titanium	B	mg/kg	0.002581	0.62550535		0	0	0	0.0947589	1	5	0%	0	0	0%	J
Titanium as TiO2	B	mg/kg	0.00431027	1.04459393		0	0	0	0.1582473	1.67	100000	0%	0	0	0%	J
Uranium	B	mg/kg	-0.000161	0		0	0	0	0.0031045	1	5	0%	0	0	0%	
Uranium, Activity	B	pCi/g	-0.000109	0		0	0	0	0.0021017	0.677	3	0%	0	0	0%	
Vanadium	B	mg/kg	0.1955	47.379425		0	0	0	0.4056939	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700231	B18020746-003	6010.20-S	SAMP		2/14/2018 7:15:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/kg	0.00667	1.656161		0	0	0	0.6068452	1	5	0%	0	0	0%	
Antimony	B	mg/kg	-0.000072	0		0	0	0	0.0277202	1	5	0%	0	0	0%	
Arsenic	B	mg/kg	-0.000214	0		0	0	0	0.0829819	1	5	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	B	mg/L	-0.0000107	0		0	0	0	0.0041491	0.05	0	0%	0	0	0%	
Barium	B	mg/kg	0.001044	0.2592252		0	0	0	0.03287	1	5	0%	0	0	0%	J
Barium as BaO	B	mg/kg	0.00116928	0.29033222		0	0	0	0.0368143	1.12	100000	0%	0	0	0%	J
Barium, TCLP equivalent (calc)	B	mg/L		0.01296043		0	0	0	0.0016434	0.0499968	0	0%	0	0	0%	DJ
Beryllium	B	mg/kg	0.000137	0.0340171		0	0	0	0.0085316	1	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700231	B18020746-003	6010.20-S	SAMP		2/14/2018 7:15:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Boron	B	mg/kg	-0.000238	0		0	0	0	0.2105584	1	5	0%	0	0	0%	
Cadmium	B	mg/kg	0.000026	0		0	0	0	0.0171079	1	5	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	B	mg/L	0.0000013	0		0	0	0	0.0008554	0.05	0	0%	0	0	0%	
Chromium	B	mg/kg	0.000904	0		0	0	0	0.2935899	1	5	0%	0	0	0%	
Chromium, TCLP equivalent (calc)	B	mg/L	0.0000452	0		0	0	0	0.0146795	0.05	0	0%	0	0	0%	
Cobalt	B	mg/kg	0.000088	0.0218504		0	0	0	0.009495	1	5	0%	0	0	0%	J
Copper	B	mg/kg	0.000414	0		0	0	0	0.1659141	1	5	0%	0	0	0%	
Lead	B	mg/kg	0.000071	0		0	0	0	0.1108411	1	5	0%	0	0	0%	
Lead, TCLP equivalent (calc)	B	mg/L	0.00000355	0		0	0	0	0.0055421	0.05	0	0%	0	0	0%	
Manganese	B	mg/kg	0.000489	0.1214187		0	0	0	0.1189357	1	5	0%	0	0	0%	J
Manganese as MnO	B	mg/kg	0.00062103	0.15420175		0	0	0	0.1510483	1.27	100000	0%	0	0	0%	J
Molybdenum	B	mg/kg	0.00711	1.765413		0	0	0	0.0232707	1	5	0%	0	0	0%	
Nickel	B	mg/kg	0.07036	17.470388		0	0	0	0.0430652	1	5	0%	0	0	0%	
Selenium	B	mg/kg	-0.000612	0		0	0	0	0.0940560	1	5	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	B	mg/L	-0.0000306	0		0	0	0	0.0047028	0.05	0	0%	0	0	0%	
Silver	B	mg/kg	-0.000002	0		0	0	0	0.0266277	1	1	0%	0	0	0%	
Silver, TCLP equivalent (calc)	B	mg/L	-0.0000001	0		0	0	0	0.0013314	0.05	0	0%	0	0	0%	
Strontium	B	mg/kg	0.000967	0.2401061		0	0	0	0.0126981	1	5	0%	0	0	0%	J
Strontium as SrO	B	mg/kg	0.00114106	0.2833252		0	0	0	0.0149837	1.18	100000	0%	0	0	0%	J
Thallium	B	mg/kg	-0.000009	0		0	0	0	0.0118141	1	5	0%	0	0	0%	
Titanium	B	mg/kg	0.002623	0.6512909		0	0	0	0.0970853	1	5	0%	0	0	0%	J
Titanium as TiO2	B	mg/kg	0.00438041	1.08765580		0	0	0	0.1621325	1.67	100000	0%	0	0	0%	J
Uranium	B	mg/kg	-0.000164	0		0	0	0	0.0031807	1	5	0%	0	0	0%	
Uranium, Activity	B	pCi/g	-0.0001110	0		0	0	0	0.0021533	0.677	3	0%	0	0	0%	
Vanadium	B	mg/kg	0.1844	45.78652		0	0	0	0.4156542	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700232	B18020746-004	6010.20-S	SAMP		2/14/2018 7:18:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Zinc	A	mg/kg	0.007291	1.80926165		0	0	0	0.6064786	1	5	0%	0	0	0%	
Antimony	B	mg/kg	-0.000078	0		0	0	0	0.0277035	1	5	0%	0	0	0%	
Arsenic	B	mg/kg	-0.000116	0		0	0	0	0.0829317	1	5	0%	0	0	0%	
Arsenic, TCLP equivalent (calc)	B	mg/L	-0.0000058	0		0	0	0	0.0041466	0.05	0	0%	0	0	0%	
Barium	B	mg/kg	0.000859	0.21316085		0	0	0	0.0328501	1	5	0%	0	0	0%	J

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700232	B18020746-004	6010.20-S	SAMP		2/14/2018 7:18:0	5	118455	2/13/2018 8:	0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium as BaO	B	mg/kg	0.00096208	0.23874015		0	0	0	0.0367921	1.12	100000	0%	0	0	0%	J
Barium, TCLP equivalent (calc)	B	mg/L		0.01065736		0	0	0	0.0016424	0.0499968	0	0%	0	0	0%	DJ
Beryllium	B	mg/kg	0.000052	0.0129038		0	0	0	0.0085264	1	5	0%	0	0	0%	J
Boron	B	mg/kg	-0.000356	0		0	0	0	0.2104312	1	5	0%	0	0	0%	
Cadmium	B	mg/kg	0.000058	0		0	0	0	0.0170975	1	5	0%	0	0	0%	
Cadmium, TCLP equivalent (calc)	B	mg/L	0.0000029	0		0	0	0	0.0008549	0.05	0	0%	0	0	0%	
Chromium	B	mg/kg	0.001284	0.3186246		0	0	0	0.2934126	1	5	0%	0	0	0%	J
Chromium, TCLP equivalent (calc)	B	mg/L	0.0000642	0.01593123		0	0	0	0.0146706	0.05	0	0%	0	0	0%	J
Cobalt	B	mg/kg	0.000038	0		0	0	0	0.0094893	1	5	0%	0	0	0%	
Copper	B	mg/kg	0.003527	0.87522505		0	0	0	0.1658138	1	5	0%	0	0	0%	J
Lead	B	mg/kg	0.000129	0		0	0	0	0.1107742	1	5	0%	0	0	0%	
Lead, TCLP equivalent (calc)	B	mg/L	0.00000645	0		0	0	0	0.0055387	0.05	0	0%	0	0	0%	
Manganese	B	mg/kg	0.000691	0.17147165		0	0	0	0.1188639	1	5	0%	0	0	0%	J
Manganese as MnO	B	mg/kg	0.00087757	0.217769		0	0	0	0.1509571	1.27	100000	0%	0	0	0%	J
Molybdenum	B	mg/kg	0.007121	1.76707615		0	0	0	0.0232566	1	5	0%	0	0	0%	
Nickel	B	mg/kg	0.06442	15.985823		0	0	0	0.0430391	1	5	0%	0	0	0%	
Selenium	B	mg/kg	-0.000821	0		0	0	0	0.0939992	1	5	0%	0	0	0%	
Selenium, TCLP equivalent (calc)	B	mg/L	-4.105E-05	0		0	0	0	0.0047	0.05	0	0%	0	0	0%	
Silver	B	mg/kg	-0.000007	0		0	0	0	0.0266116	1	1	0%	0	0	0%	
Silver, TCLP equivalent (calc)	B	mg/L	-3.5E-07	0		0	0	0	0.0013306	0.05	0	0%	0	0	0%	
Strontium	B	mg/kg	0.000937	0.23251655		0	0	0	0.0126904	1	5	0%	0	0	0%	J
Strontium as SrO	B	mg/kg	0.00110566	0.27436953		0	0	0	0.0149747	1.18	100000	0%	0	0	0%	J
Thallium	B	mg/kg	-0.000222	0		0	0	0	0.011807	1	5	0%	0	0	0%	
Titanium	B	mg/kg	0.002372	0.5886118		0	0	0	0.0970267	1	5	0%	0	0	0%	J
Titanium as TiO2	B	mg/kg	0.00396124	0.98298171		0	0	0	0.1620345	1.67	100000	0%	0	0	0%	J
Uranium	B	mg/kg	-0.00016	0		0	0	0	0.0031788	1	5	0%	0	0	0%	
Uranium, Activity	B	pCi/g	-0.0001083	0		0	0	0	0.0021520	0.677	3	0%	0	0	0%	
Vanadium	B	mg/kg	0.1751	43.451065		0	0	0	0.4154031	1	5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700233	CCV	ICPMS-200.8-W CCV			2/14/2018 7:21:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700233	CCV	ICPMS-200.8-W	CCV		2/14/2018 7:21:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	0.04986	0.04986		0.05	0	0	0.0002849	0.1	4.5	100%	90	110	0%	
Antimony	A	mg/L	0.05163	0.05163		0.05	0	0	3.047E-05	0.05	18	103%	90	110	0%	
Arsenic	A	mg/L	0.04971	0.04971		0.05	0	0	6.629E-05	0.005	18	99%	90	110	0%	
Barium	A	mg/L	0.05338	0.05338		0.05	0	0	6.437E-05	0.1	18	107%	90	110	0%	
Beryllium	A	mg/L	0.04858	0.04858		0.05	0	0	8.97E-06	0.001	4.5	97%	90	110	0%	
Boron	A	mg/L	0.04747	0.04747		0.05	0	0	0.00141	0.1	4.5	95%	90	110	0%	
Cadmium	A	mg/L	0.05079	0.05079		0.05	0	0	1.468E-05	0.001	18	102%	90	110	0%	
Cerium	A	mg/L	0.05274	0.05274		0.05	0	0	2.257E-05	0.001	4.5	105%	90	110	0%	
Chromium	A	mg/L	0.04564	0.04564		0.05	0	0	5.576E-05	0.01	18	91%	90	110	0%	
Cobalt	A	mg/L	0.0465	0.0465		0.05	0	0	3.904E-05	0.01	18	93%	90	110	0%	
Copper	A	mg/L	0.04904	0.04904		0.05	0	0	7.681E-05	0.01	4.5	98%	90	110	0%	
Iron	A	mg/L	1.207	1.207		1.3	0	0	0.000175	0.02	4.5	93%	90	110	0%	
Lanthanum	A	mg/L	0.05286	0.05286		0.05	0	0	0.0000111	0.001	4.5	106%	90	110	0%	
Lead	A	mg/L	0.05018	0.05018		0.05	0	0	2.956E-05	0.01	18	100%	90	110	0%	
Manganese	A	mg/L	0.04612	0.04612		0.05	0	0	3.649E-05	0.01	18	92%	90	110	0%	
Mercury	A	mg/L	0.001087	0.001087		0.001	0	0	1.289E-05	0.001	0.36	109%	90	110	0%	
Molybdenum	A	mg/L	0.04651	0.04651		0.05	0	0	2.302E-05	0.005	9	93%	90	110	0%	
Nickel	A	mg/L	0.04764	0.04764		0.05	0	0	7.128E-05	0.01	4.5	95%	90	110	0%	
Selenium	A	mg/L	0.05063	0.05063		0.05	0	0	0.0001532	0.005	18	101%	90	110	0%	
Silver	A	mg/L	0.01865	0.01865		0.02	0	0	2.959E-05	0.005	1.8	93%	90	110	0%	
Strontium	A	mg/L	0.05043	0.05043		0.05	0	0	1.229E-05	0.1	18	101%	90	110	0%	
Thallium	A	mg/L	0.04962	0.04962		0.05	0	0	1.434E-05	0.1	18	99%	90	110	0%	
Thorium	A	mg/L	0.04221	0.04221		0.05	0	0	5.767E-05	0.001	4.5	84%	90	110	0%	S
Thorium 232	A	mg/L	0.04221	0.04221		0.05	0	0	5.767E-05	0.01	4.5	84%	90	110	0%	S
Tin	A	mg/L	0.04984	0.04984		0.05	0	0	5.199E-05	0.1	9	100%	90	110	0%	
Titanium	A	mg/L	0.0454	0.0454		0.05	0	0	0.0001736	0.01	18	91%	90	110	0%	
Uranium	A	mg/L	0.05105	0.05105		0.05	0	0	1.332E-05	0.001	4.5	102%	90	110	0%	
Vanadium	A	mg/L	0.04684	0.04684		0.05	0	0	7.351E-05	0.1	18	94%	90	110	0%	
Zinc	A	mg/L	0.04967	0.04967		0.05	0	0	0.0002495	0.01	4.5	99%	90	110	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700234	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 7:23:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700234	Rinse	ICPMS-200.8-W	SAMP		2/14/2018 7:23:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.001787	0		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000008	0		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000086	0		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	
Barium	A	mg/L	-0.001661	0		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000038	0.000038		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	J
Boron	A	mg/L	-0.000447	0		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000028	0		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000138	0		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000151	0		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000184	0		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000144	0		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	-0.001035	0		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	-0.000134	0		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000018	0		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.00063	0		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000092	0.000092		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	J
Molybdenum	A	mg/L	0.000212	0.000212		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	J
Nickel	A	mg/L	0.000068	0		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000187	0		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	0.000064	0.000064		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	J
Strontium	A	mg/L	-0.000101	0		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000132	0		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Tin	A	mg/L	0.000692	0.000692		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	J
Titanium	A	mg/L	-0.000117	0		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000092	0		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000266	0.000266		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	J
Zinc	A	mg/L	-0.0002	0		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700235	CCB	ICPMS-200.8-W	CCB		2/14/2018 7:26:0	1	R294811		0	0	

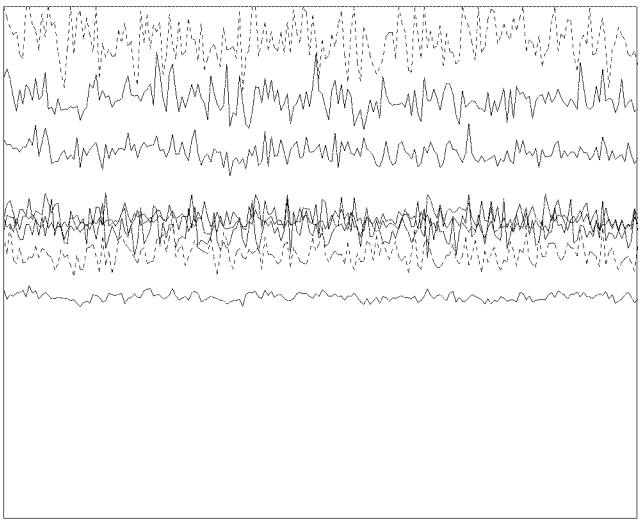
Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Aluminum	A	mg/L	-0.003017	-0.003017		0	0	0	0.0002849	0.1	4.5	0%	0	0	0%	
Antimony	A	mg/L	-0.000097	-0.000097		0	0	0	3.047E-05	0.05	18	0%	0	0	0%	
Arsenic	A	mg/L	-0.000192	-0.000192		0	0	0	6.629E-05	0.005	18	0%	0	0	0%	

Seq No	Lab ID	Test Code	Sample Typ	File ID	Analysis Date	DF	Batch ID	Prep Date	SPKref	RPDref	pmoist
11700235	CCB	ICPMS-200.8-W	CCB		2/14/2018 7:26:0	1	R294811		0	0	

Analyte	T	Units	RAW	Final	Text	Spike	SPKref	RPDref	MDL	PQL	UQL	%REC	LOW	HIGH	%RPD	Q
Barium	A	mg/L	-0.00166	-0.00166		0	0	0	6.437E-05	0.1	18	0%	0	0	0%	
Beryllium	A	mg/L	0.000025	0.000025		0	0	0	8.97E-06	0.001	4.5	0%	0	0	0%	
Boron	A	mg/L	-0.00074	-0.00074		0	0	0	0.00141	0.1	4.5	0%	0	0	0%	
Cadmium	A	mg/L	-0.000047	-0.000047		0	0	0	1.468E-05	0.001	18	0%	0	0	0%	
Cerium	A	mg/L	-0.000154	-0.000154		0	0	0	2.257E-05	0.001	4.5	0%	0	0	0%	
Chromium	A	mg/L	-0.000138	-0.000138		0	0	0	5.576E-05	0.01	18	0%	0	0	0%	
Cobalt	A	mg/L	-0.000191	-0.000191		0	0	0	3.904E-05	0.01	18	0%	0	0	0%	
Copper	A	mg/L	-0.000126	-0.000126		0	0	0	7.681E-05	0.01	4.5	0%	0	0	0%	
Iron	A	mg/L	-0.002715	-0.002715		0	0	0	0.000175	0.02	4.5	0%	0	0	0%	
Lanthanum	A	mg/L	-0.000147	-0.000147		0	0	0	0.0000111	0.001	4.5	0%	0	0	0%	
Lead	A	mg/L	-0.000092	-0.000092		0	0	0	2.956E-05	0.01	18	0%	0	0	0%	
Manganese	A	mg/L	-0.00076	-0.00076		0	0	0	3.649E-05	0.01	18	0%	0	0	0%	
Mercury	A	mg/L	0.000075	0.000075		0	0	0	1.289E-05	0.001	0.36	0%	0	0	0%	
Molybdenum	A	mg/L	-0.000034	-0.000034		0	0	0	2.302E-05	0.005	9	0%	0	0	0%	
Nickel	A	mg/L	-0.000034	-0.000034		0	0	0	7.128E-05	0.01	4.5	0%	0	0	0%	
Selenium	A	mg/L	-0.000472	-0.000472		0	0	0	0.0001532	0.005	18	0%	0	0	0%	
Silver	A	mg/L	-0.000034	-0.000034		0	0	0	2.959E-05	0.005	1.8	0%	0	0	0%	
Strontium	A	mg/L	-0.000131	-0.000131		0	0	0	1.229E-05	0.1	18	0%	0	0	0%	
Thallium	A	mg/L	-0.000177	-0.000177		0	0	0	1.434E-05	0.1	18	0%	0	0	0%	
Thorium	A	mg/L	-0.000004	-0.000004		0	0	0	5.767E-05	0.001	4.5	0%	0	0	0%	
Thorium 232	A	mg/L	-0.000004	-0.000004		0	0	0	5.767E-05	0.01	4.5	0%	0	0	0%	
Tin	A	mg/L	0.000096	0.000096		0	0	0	5.199E-05	0.1	9	0%	0	0	0%	
Titanium	A	mg/L	-0.000015	-0.000015		0	0	0	0.0001736	0.01	18	0%	0	0	0%	
Uranium	A	mg/L	-0.000121	-0.000121		0	0	0	1.332E-05	0.001	4.5	0%	0	0	0%	
Vanadium	A	mg/L	0.000115	0.000115		0	0	0	7.351E-05	0.1	18	0%	0	0	0%	
Zinc	A	mg/L	-0.000012	-0.000012		0	0	0	0.0002495	0.01	4.5	0%	0	0	0%	

Sensitivity

Tune File : ATUNE.U



Integration Time: 0.1000 sec
Sampling Period: 1.1300 sec
n: 200

m/z	Range	Count	Mean	RSD%
7	5,000	2936.0	2956.6	3.10
89	10,000	8005.0	8201.1	3.32
205	20,000	11262.0	11302.7	4.49
156/140	2	1.006%	1.114%	11.08
70/140	2	0.844%	0.972%	10.28
9	10,000	5762.0	5775.4	2.09
24	500,000	214403.0	216597.0	1.71
59	10,000	7039.0	7157.8	2.51
115	10,000	5308.0	5177.5	4.06
208	5,000	4435.0	4682.1	4.62

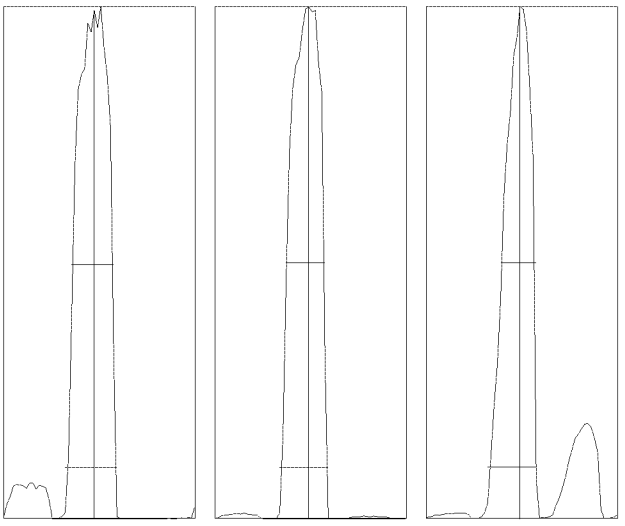
Tuning Parameters

===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	-175 V	AMU Gain	:	128
RF Matching	:	1.8 V	Extract 2	:	-80 V	AMU Offset	:	124
Smpl Depth	:	9 mm	Einzel 1,3	:	-50 V	Axis Gain	:	0.9996
Torch-H	:	-1.3 mm	Einzel 2	:	-10 V	Axis Offset	:	-0.16
Torch-V	:	-0.1 mm	Omega Bias	:	-190 V	QP Bias	:	0
Carrier Gas	:	1 L/min	Omega (+)	:	6 V			
Makeup Gas	:	0 L/min	Omega (-)	:	-23 V	===Detector Parameters==		
Optional Gas	:	--- %	QP Focus	:	9 V	Discriminator	:	9.1
Nebulizer Pump	:	0.1 rps	Plate Bias	:	-5 V	Analog HV	:	1720
Sample Pump	:	--- rps				Pulse HV	:	1370
S/C Temp	:	2 degC						

Generated : Feb 14, 2018 10:18:24
Printed : Feb 14, 2018 10:18:29

Resolution/Axis

Tune File : ATUNE.U



m/z:	7	89	205
Height:	2,924	8,043	11,178
Axis:	6.95	89.00	205.00
W-50%:	0.65	0.60	0.55
W-10%:	0.800	0.7500	0.7500

Integration Time: 0.1000 sec
Acquisition Time: 22.7600 sec

Y axis : Linear

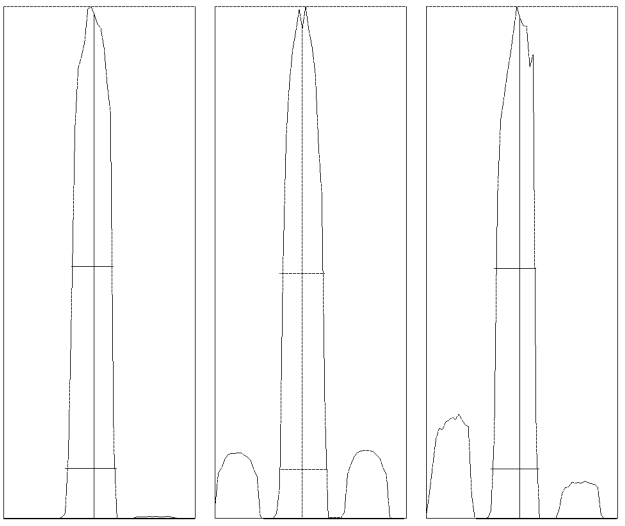
Tuning Parameters

===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	-175 V	AMU Gain	:	128
RF Matching	:	1.8 V	Extract 2	:	-80 V	AMU Offset	:	124
Smpl Depth	:	9 mm	Einzel 1,3	:	-50 V	Axis Gain	:	0.9996
Torch-H	:	-1.3 mm	Einzel 2	:	-10 V	Axis Offset	:	-0.16
Torch-V	:	-0.1 mm	Omega Bias	:	-190 V	QP Bias	:	0
Carrier Gas	:	1 L/min	Omega (+)	:	6 V			
Makeup Gas	:	0 L/min	Omega (-)	:	-23 V	===Detector Parameters==		
Optional Gas	:	--- %	QP Focus	:	9 V	Discriminator	:	9.1
Nebulizer Pump	:	0.1 rps	Plate Bias	:	-5 V	Analog HV	:	1720
Sample Pump	:	--- rps				Pulse HV	:	1370
S/C Temp	:	2 degC						

Generated : Feb 14, 2018 10:19:50
Printed : Feb 14, 2018 10:19:55

Resolution/Axis

Tune File : ATUNE.U



m/z:	9	24	59
Height:	5,913	220,876	7,126
Axis:	8.95	23.90	59.00
W-50%:	0.65	0.70	0.65
W-10%:	0.800	0.7500	0.7500

Integration Time: 0.1000 sec
Acquisition Time: 22.2600 sec

Y axis : Linear

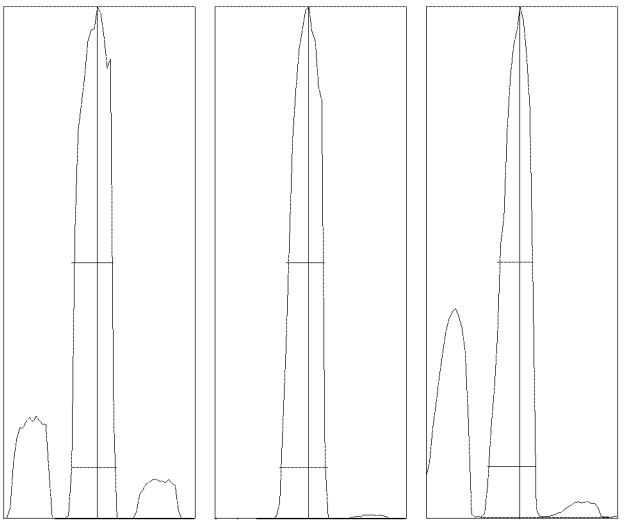
Tuning Parameters

===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	-175 V	AMU Gain	:	128
RF Matching	:	1.8 V	Extract 2	:	-80 V	AMU Offset	:	124
Smpl Depth	:	9 mm	Einzel 1,3	:	-50 V	Axis Gain	:	0.9996
Torch-H	:	-1.3 mm	Einzel 2	:	-10 V	Axis Offset	:	-0.16
Torch-V	:	-0.1 mm	Omega Bias	:	-190 V	QP Bias	:	0
Carrier Gas	:	1 L/min	Omega (+)	:	6 V			
Makeup Gas	:	0 L/min	Omega (-)	:	-23 V	===Detector Parameters==		
Optional Gas	:	--- %	QP Focus	:	9 V	Discriminator	:	9.1
Nebulizer Pump	:	0.1 rps	Plate Bias	:	-5 V	Analog HV	:	1720
Sample Pump	:	--- rps				Pulse HV	:	1370
S/C Temp	:	2 degC						

Generated : Feb 14, 2018 10:21:02
Printed : Feb 14, 2018 10:21:07

Resolution/Axis

Tune File : ATUNE.U



m/z:	59	115	208
Height:	7,094	5,154	4,599
Axis:	59.00	115.00	208.00
W-50%:	0.65	0.60	0.55
W-10%:	0.700	0.7500	0.7500

Integration Time: 0.1000 sec
Acquisition Time: 22.5600 sec

Y axis : Linear

Tuning Parameters

===Plasma Condition===			===Ion Lenses===			===Q-Pole Parameters===		
RF Power	:	1550 W	Extract 1	:	-175 V	AMU Gain	:	128
RF Matching	:	1.8 V	Extract 2	:	-80 V	AMU Offset	:	124
Smpl Depth	:	9 mm	Einzel 1,3	:	-50 V	Axis Gain	:	0.9996
Torch-H	:	-1.3 mm	Einzel 2	:	-10 V	Axis Offset	:	-0.16
Torch-V	:	-0.1 mm	Omega Bias	:	-190 V	QP Bias	:	0
Carrier Gas	:	1 L/min	Omega (+)	:	6 V			
Makeup Gas	:	0 L/min	Omega (-)	:	-23 V	===Detector Parameters==		
Optional Gas	:	--- %	QP Focus	:	9 V	Discriminator	:	9.1
Nebulizer Pump	:	0.1 rps	Plate Bias	:	-5 V	Analog HV	:	1720
Sample Pump	:	--- rps				Pulse HV	:	1370
S/C Temp	:	2 degC						

Generated : Feb 14, 2018 10:22:02
Printed : Feb 14, 2018 10:22:07

P/A Factor Tuning Report

Acquired:Feb 14 2018 10:29 am

Mass[amu]	Element	P/A Factor
9	Be	0.084453
27	Al	Sensitivity too high
47	Ti	0.100444
51	V	Sensitivity too high
52	Cr	Sensitivity too high
53	Cr	0.105768
55	Mn	Sensitivity too high
59	Co	Sensitivity too high
60	Ni	0.113185
62	Ni	0.113144
63	Cu	Sensitivity too high
65	Cu	0.116492
66	Zn	0.115602
75	As	0.113900
77	Se	Sensitivity too low
82	Se	Sensitivity too low
88	Sr	Sensitivity too high
95	Mo	Sensitivity too high
97	Mo	0.114108
98	Mo	Sensitivity too high
107	Ag	Sensitivity too high
109	Ag	Sensitivity too high
111	Cd	0.121899
114	Cd	Sensitivity too high
118	Sn	Sensitivity too high
121	Sb	Sensitivity too high
123	Sb	Sensitivity too high
135	Ba	0.120306
137	Ba	Sensitivity too high
203	Tl	Sensitivity too high
205	Tl	Sensitivity too high
206	Pb	Sensitivity too high
207	Pb	Sensitivity too high
208	Pb	Sensitivity too high
232	Th	Sensitivity too high
238	U	Sensitivity too high

===Detector Parameters===
Discriminator: 9.1 mV
Analog HV: 1720 V
Pulse HV: 1370 V

P/A Factor Tuning Report

Acquired:Feb 14 2018 10:31 am

Mass[amu]	Element	P/A Factor
9	Be	0.082789
27	Al	0.101137
47	Ti	0.100444
51	V	Sensitivity too high
52	Cr	Sensitivity too high
53	Cr	0.105365
55	Mn	Sensitivity too high
59	Co	Sensitivity too high
60	Ni	0.112848
62	Ni	0.113144
63	Cu	0.116727
65	Cu	0.116020
66	Zn	0.115135
75	As	0.112947
77	Se	Sensitivity too low
82	Se	Sensitivity too low
88	Sr	Sensitivity too high
95	Mo	0.112972
97	Mo	0.113158
98	Mo	0.114223
107	Ag	0.121443
109	Ag	0.121666
111	Cd	0.121426
114	Cd	0.122190
118	Sn	0.120988
121	Sb	0.121625
123	Sb	0.121305
135	Ba	0.120219
137	Ba	0.120747
203	Tl	0.129440
205	Tl	Sensitivity too high
206	Pb	0.129176
207	Pb	0.129586
208	Pb	0.129303
232	Th	Sensitivity too high
238	U	Sensitivity too high

===Detector Parameters===
  Discriminator: 9.1 mV
      Analog HV: 1720 V
       Pulse HV: 1370 V

P/A Factor Tuning Report

Acquired:Feb 14 2018 10:32 am

Mass[amu]	Element	P/A Factor
9	Be	0.082700
27	Al	0.100685
47	Ti	0.100444
51	V	0.103638
52	Cr	0.106072
53	Cr	0.105365
55	Mn	0.109029
59	Co	0.112297
60	Ni	0.113000
62	Ni	0.113144
63	Cu	0.116019
65	Cu	0.115736
66	Zn	0.114965
75	As	0.112846
77	Se	Sensitivity too low
82	Se	Sensitivity too low
88	Sr	0.115291
95	Mo	0.112999
97	Mo	0.113429
98	Mo	0.114228
107	Ag	0.121649
109	Ag	0.122112
111	Cd	0.121461
114	Cd	0.122307
118	Sn	0.121425
121	Sb	0.121632
123	Sb	0.121321
135	Ba	0.120219
137	Ba	0.120932
203	Tl	0.131220
205	Tl	0.132427
206	Pb	0.130721
207	Pb	0.130763
208	Pb	0.131777
232	Th	0.131873
238	U	0.132045

===Detector Parameters===
Discriminator: 9.1 mV
Analog HV: 1720 V
Pulse HV: 1370 V

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\002SMPL.D\002SMPL.D#
Date Acquired: Feb 14 2018 12:12 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 13 2018 08:37 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	1.336	1.336	ug/l	33.53	4500.00	334.44		P
11 B	13.730	13.730	ug/l	4.30	4500.00	2015.56		P
27 Al	-0.624	-0.624	ug/l	63.41	4500.00	1333.33		P
47 Ti	1.999	1.999	ug/l	57.58	4500.00	170.00		P
51 V	0.858	0.858	ug/l	35.11	4500.00	1668.95		P
52 Cr	0.528	0.528	ug/l	95.08	4500.00	3433.33		P
53 Cr	0.914	0.914	ug/l	83.09	4500.00	260.00		P
55 Mn	-2.065	-2.065	ug/l	19.37	4500.00	2173.33		P
57 Fe	4.279	4.279	ug/l	107.03	4500.00	5576.67		P
59 Co	1.138	1.138	ug/l	15.52	4500.00	1780.00		P
60 Ni	1.274	1.274	ug/l	55.24	4500.00	340.00		P
62 Ni	0.797	0.797	ug/l	138.39	4500.00	186.67		P
63 Cu	1.539	1.539	ug/l	18.51	4500.00	1040.00		P
65 Cu	1.189	1.189	ug/l	46.03	4500.00	433.33		P
66 Zn	1.216	1.216	ug/l	51.83	4500.00	349.74		P
75 As	1.039	1.039	ug/l	33.64	4500.00	371.13		P
77 Se	0.756	0.756	ug/l	85.03	4500.00	60.00		P
79 Br	71.730	71.730	ug/l	---	#VALUE!	123.33		P
82 Se	-0.397	-0.397	ug/l	284.74	4500.00	22.60		P
88 Sr	1.087	1.087	ug/l	36.05	4500.00	2273.33		P
95 Mo	1.439	1.439	ug/l	41.46	4500.00	620.00		P
97 Mo	1.548	1.548	ug/l	24.73	4500.00	443.33		P
98 Mo	1.896	1.896	ug/l	21.45	4500.00	1251.31		P
107 Ag	0.477	0.477	ug/l	29.68	1800.00	600.00		P
109 Ag	0.561	0.561	ug/l	23.61	1800.00	654.44		P
111 Cd	0.902	0.902	ug/l	31.90	4500.00	957.68		P
114 Cd	1.449	1.449	ug/l	41.67	4500.00	802.26		P
118 Sn	0.414	0.414	ug/l	36.97	4500.00	956.67		P
121 Sb	0.952	0.952	ug/l	41.39	4500.00	1336.33		P
123 Sb	0.928	0.928	ug/l	38.18	4500.00	1021.67		P
135 Ba	1.163	1.163	ug/l	44.14	4500.00	320.00		P
137 Ba	1.178	1.178	ug/l	36.89	4500.00	576.67		P
139 La	-0.242	-0.242	ug/l	2.96	4500.00	23.33		P
140 Ce	-0.189	-0.189	ug/l	4.16	4500.00	56.67		P
199 Hg	-0.207	-0.207	ug/l	45.56	450.00	82.33		P
200 Hg	-0.164	-0.164	ug/l	26.89	450.00	100.67		P
202 Hg	-0.154	-0.154	ug/l	14.13	450.00	107.33		P
203 Tl	-1.560	-1.560	ug/l	12.02	4500.00	2106.67		P
205 Tl	-1.581	-1.581	ug/l	20.99	4500.00	4516.67		P
206 Pb	-1.086	-1.086	ug/l	36.09	4500.00	1706.67		P
207 Pb	-0.887	-0.887	ug/l	41.16	4500.00	1670.00		P
208 Pb	-0.982	-0.982	ug/l	40.56	4500.00	7206.67		P
232 Th	0.971	0.971	ug/l	31.75	4500.00	9725.55		P
238 U	1.151	1.151	ug/l	35.70	4500.00	9216.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	614190.00	2.12	---	#VALUE!	60.000002	-	125
72 Ge	861726.63	1.37	---	#VALUE!	60.000002	-	125
89 Y	1332993.00	1.49	---	#VALUE!	60.000002	-	125
115 In	1655292.40	2.32	---	#VALUE!	60.000002	-	125
209 Bi	5414711.00	0.81	---	#VALUE!	60.000002	-	125

ISTD Ref File : ---

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01044

Cal Blk QC Report ICPMS202-B

Data File:	C:\ICPCHEM\1\DATA\18B14m00.B\003CALB
Date Acquired:	Feb 14 2018 12:15 pm
Operator:	JPV
Sample Name:	Cal Blank
Misc Info:	ICPMS-200.8-W-D
Vial Number:	2
Current Method:	C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File:	C:\ICPCHEM\1\DATA\16A04J00.B\208CLds
Last Cal Update:	Feb 14 2018 12:17 pm
Sample Type:	CalBlk
Total Dil Factor:	1.00

QC&ISTD Elements

Element		CPS Mean		SD	RSD(%)
6	Li		P		
9	Be	171.11	P	18.36	10.73
11	B	2161.11	P	143.30	6.63
27	Al	2783.33	P	3453.00	124.06
45	Sc	609356.69	P	6379.00	1.05
47	Ti	106.67	P	28.87	27.07
51	V	836.10	P	54.85	6.56
52	Cr	2696.67	P	25.17	0.93
53	Cr	203.33	P	25.17	12.38
55	Mn	1170.00	P	79.37	6.78
57	Fe	5703.33	P	104.10	1.83
59	Co	910.00	P	87.18	9.58
60	Ni	210.00	P	81.85	38.98
62	Ni	166.67	P	20.82	12.49
63	Cu	593.33	P	95.04	16.02
65	Cu	253.33	P	45.09	17.80
66	Zn	356.55	P	20.80	5.83
72	Ge	849473.31	P	19310.00	2.27
75	As	235.01	P	1.92	0.82
77	Se	53.33	P	3.21	6.03
79	Br	196.67	P	40.41	20.55
82	Se	23.27	P	4.79	20.60
83	Kr	86.33	P	13.58	15.73
88	Sr	746.67	P	90.74	12.15
89	Y	1346571.00	A	38660.00	2.87
95	Mo	290.00	P	95.39	32.89
97	Mo	210.00	P	30.00	14.29
98	Mo	553.11	P	97.20	17.57
107	Ag	474.44	P	52.10	10.98
109	Ag	477.78	P	25.46	5.33
111	Cd	691.92	P	27.01	3.90
114	Cd	220.60	P	78.85	35.74
115	In	1630928.00	A	62660.00	3.84
118	Sn	586.67	P	68.07	11.60
121	Sb	637.67	P	68.04	10.67
123	Sb	505.00	P	70.38	13.94
135	Ba	116.67	P	5.77	4.95
137	Ba	213.33	P	37.86	17.75
139	La	23.33	P	15.28	65.49
140	Ce	46.67	P	25.17	53.94
199	Hg	81.00	P	11.36	14.03
200	Hg	87.33	P	12.50	14.31
202	Hg	116.33	P	10.97	9.43
203	Tl	760.00	P	50.00	6.58
205	Tl	1830.00	P	141.10	7.71
206	Pb	756.67	P	143.60	18.98
207	Pb	686.67	P	116.80	17.01
208	Pb	2746.67	P	318.90	11.61
209	Bi	5261894.00	A	237500.00	4.51
232	Th	5297.78	P	288.50	5.45
238	U	4103.33	P	184.70	4.50

ED_004985_00011411-01045

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\004CALS.D\004CALS.D#
Date Acquired: Feb 14 2018 12:18 pm
Operator: JPV
Sample Name: 0.5 ppb std
Misc Info: ICPMS-200.8-W-D
Vial Number: 4304
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:17 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	608.89	P	24.11	3.96
11 B	2315.55	P	151.50	6.54
27 Al	2510.00	P	238.10	9.49
45 Sc	607433.31	P	3510.00	0.58
47 Ti	253.33	P	41.63	16.43
51 V	3127.65	P	318.10	10.17
52 Cr	4583.33	P	170.40	3.72
53 Cr	343.33	P	50.33	14.66
55 Mn	3596.67	P	104.10	2.89
57 Fe	7200.00	P	105.40	1.46
59 Co	2953.33	P	193.00	6.54
60 Ni	746.67	P	96.09	12.87
62 Ni	246.67	P	45.09	18.28
63 Cu	1910.00	P	140.00	7.33
65 Cu	956.67	P	85.05	8.89
66 Zn	1173.00	P	132.80	11.32
72 Ge	844740.00	P	10830.00	1.28
75 As	615.68	P	25.38	4.12
77 Se	78.00	P	11.53	14.78
79 Br	146.67	P	66.58	45.40
82 Se	46.73	P	8.48	18.14
88 Sr	4293.33	P	245.40	5.72
89 Y	1351505.00	A	16260.00	1.20
95 Mo	930.00	P	26.46	2.85
97 Mo	633.33	P	68.07	10.75
98 Mo	1466.03	P	169.20	11.54
107 Ag	1082.22	P	13.88	1.28
109 Ag	1036.67	P	70.00	6.75
111 Cd	1289.11	P	38.77	3.01
114 Cd	1539.37	P	25.51	1.66
115 In	1624861.00	A	12510.00	0.77
118 Sn	1846.67	P	279.70	15.15
121 Sb	2652.00	P	47.03	1.77
123 Sb	2032.33	P	54.63	2.69
135 Ba	600.00	P	17.32	2.89
137 Ba	1056.67	P	45.09	4.27
139 La	8926.67	P	255.80	2.87
140 Ce	8780.00	P	115.30	1.31
199 Hg	81.67	P	7.02	8.60
200 Hg	108.33	P	21.55	19.89
202 Hg	130.33	P	19.01	14.59
203 Tl	3893.33	P	132.00	3.39
205 Tl	9333.33	P	330.80	3.54
206 Pb	3286.67	P	223.00	6.79
207 Pb	3133.33	P	158.90	5.07
208 Pb	13353.33	P	610.40	4.57
209 Bi	5280632.00	A	34820.00	0.66
232 Th	9820.00	P	1702.00	17.33
238 U	17320.00	P	1127.00	6.51

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	607433.31	0.58	609356.69	99.7	60 - 125	
72 Ge	844740.00	1.28	849473.38	99.4	60 - 125	
89 Y	1351504.50	1.20	1346571.10	100.4	60 - 125	
115 In	1624861.10	0.77	1630928.10	99.6	60 - 125	
209 Bi	5280632.50	0.66	5261894.50	100.4	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01046

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\005CALS.D\005CALS.D#
Date Acquired: Feb 14 2018 12:20 pm
Operator: JPV
Sample Name: 10 ppb std
Misc Info: ICPMS-200.8-W-D
Vial Number: 4305
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:20 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	8240.00	P	237.90	2.89
11 B	6558.89	P	140.60	2.14
27 Al	20620.00	P	675.80	3.28
45 Sc	594253.31	P	9468.00	1.59
47 Ti	2793.33	P	296.90	10.63
51 V	40111.57	P	2184.00	5.44
52 Cr	37376.67	P	1442.00	3.86
53 Cr	4113.33	P	45.09	1.10
55 Mn	47006.66	P	1543.00	3.28
57 Fe	32316.67	P	645.30	2.00
59 Co	43216.66	P	1227.00	2.84
60 Ni	9630.00	P	60.83	0.63
62 Ni	1526.67	P	95.04	6.23
63 Cu	24743.33	P	675.20	2.73
65 Cu	11896.67	P	207.40	1.74
66 Zn	8497.16	P	441.90	5.20
72 Ge	820416.63	P	12280.00	1.50
75 As	8293.60	P	385.30	4.65
77 Se	579.67	P	26.01	4.49
79 Br	133.33	P	40.41	30.31
82 Se	752.20	P	55.02	7.31
88 Sr	70873.33	P	3607.00	5.09
89 Y	1294083.00	A	14630.00	1.13
95 Mo	13426.67	P	439.20	3.27
97 Mo	8360.00	P	419.40	5.02
98 Mo	21297.49	P	1163.00	5.46
107 Ag	15811.11	P	171.70	1.09
109 Ag	15430.00	P	414.80	2.69
111 Cd	11770.26	P	673.50	5.72
114 Cd	24834.24	P	381.70	1.54
115 In	1583899.00	A	38480.00	2.43
118 Sn	25696.67	P	1176.00	4.58
121 Sb	40894.67	P	835.00	2.04
123 Sb	31643.00	P	828.40	2.62
135 Ba	9823.33	P	156.90	1.60
137 Ba	17050.00	P	441.70	2.59
139 La	164686.70	P	6085.00	3.69
140 Ce	159450.00	P	5241.00	3.29
199 Hg	241.33	P	23.59	9.77
200 Hg	292.67	P	22.03	7.53
202 Hg	380.33	P	47.88	12.59
203 Tl	63996.66	P	1917.00	3.00
205 Tl	153250.00	P	1961.00	1.28
206 Pb	51150.00	P	722.70	1.41
207 Pb	47033.33	P	1163.00	2.47
208 Pb	213303.30	P	5819.00	2.73
209 Bi	5141662.00	A	39180.00	0.76
232 Th	139743.30	P	18810.00	13.46
238 U	269896.69	P	8556.00	3.17

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	594253.31	1.59	609356.69	97.5	60 - 125	
72 Ge	820416.63	1.50	849473.38	96.6	60 - 125	
89 Y	1294082.80	1.13	1346571.10	96.1	60 - 125	
115 In	1583899.00	2.43	1630928.10	97.1	60 - 125	
209 Bi	5141662.50	0.76	5261894.50	97.7	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01047

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\006CALS.D\006CALS.D#
Date Acquired: Feb 14 2018 12:23 pm
Operator: JPV
Sample Name: 50 ppb std
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:22 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	39443.33	P	553.60	1.40
11 B	25682.22	P	206.70	0.80
27 Al	96400.00	P	1525.00	1.58
45 Sc	588073.31	P	13430.00	2.28
47 Ti	13453.33	P	508.60	3.78
51 V	194875.50	P	1817.00	0.93
52 Cr	173266.70	P	1760.00	1.02
53 Cr	19850.00	P	555.60	2.80
55 Mn	226743.30	P	1514.00	0.67
57 Fe	135350.00	P	790.20	0.58
59 Co	204786.70	P	1732.00	0.85
60 Ni	46650.00	P	667.30	1.43
62 Ni	6843.33	P	102.60	1.50
63 Cu	113896.70	P	1549.00	1.36
65 Cu	56506.66	P	1833.00	3.24
66 Zn	37743.87	P	115.20	0.31
72 Ge	817306.63	P	14850.00	1.82
75 As	40393.23	P	58.19	0.14
77 Se	2658.67	P	42.34	1.59
79 Br	296.67	P	30.55	10.30
82 Se	3513.80	P	23.73	0.68
88 Sr	343113.31	P	7155.00	2.09
89 Y	1290302.00	A	23110.00	1.79
95 Mo	67560.00	P	1114.00	1.65
97 Mo	42706.66	P	485.00	1.14
98 Mo	111171.30	P	2834.00	2.55
107 Ag	83724.44	P	1990.00	2.38
109 Ag	80512.22	P	1988.00	2.47
111 Cd	53045.85	P	444.40	0.84
114 Cd	121695.50	P	810.10	0.67
115 In	1543649.00	A	11570.00	0.75
118 Sn	130556.70	P	3782.00	2.90
121 Sb	193659.00	P	1377.00	0.71
123 Sb	151766.70	P	2040.00	1.34
135 Ba	47560.00	P	970.40	2.04
137 Ba	83613.33	P	378.70	0.45
139 La	797493.31	P	8296.00	1.04
140 Ce	773943.31	P	2001.00	0.26
199 Hg	1244.67	P	59.74	4.80
200 Hg	1754.33	P	52.20	2.98
202 Hg	2232.33	P	44.12	1.98
203 Tl	302300.00	P	1718.00	0.57
205 Tl	733773.31	P	3460.00	0.47
206 Pb	243360.00	P	1326.00	0.54
207 Pb	221420.00	P	2941.00	1.33
208 Pb	1002720.00	P	9066.00	0.90
209 Bi	4912909.00	A	11780.00	0.24
232 Th	1093038.00	P	30780.00	2.82
238 U	1274385.00	A	30680.00	2.41

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	588073.31	2.28	609356.69	96.5	60 - 125	
72 Ge	817306.63	1.82	849473.38	96.2	60 - 125	
89 Y	1290302.40	1.79	1346571.10	95.8	60 - 125	
115 In	1543649.30	0.75	1630928.10	94.6	60 - 125	
209 Bi	4912909.50	0.24	5261894.50	93.4	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01048

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\007CALS.D\007CALS.D#
Date Acquired: Feb 14 2018 12:26 pm
Operator: JPV
Sample Name: 100 ppb std
Misc Info: ICPMS-200.8-W-D
Vial Number: 4306
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:25 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	75744.44	P	2241.00	2.96
11 B	47917.77	P	1010.00	2.11
27 Al	186330.00	P	3205.00	1.72
45 Sc	576190.00	P	8907.00	1.55
47 Ti	26910.00	P	1093.00	4.06
51 V	380952.19	P	8696.00	2.28
52 Cr	332976.69	P	13920.00	4.18
53 Cr	38860.00	P	1154.00	2.97
55 Mn	436776.69	P	8585.00	1.97
57 Fe	256616.70	P	6480.00	2.53
59 Co	398333.31	P	8351.00	2.10
60 Ni	89343.33	P	676.00	0.76
62 Ni	13616.67	P	694.00	5.10
63 Cu	220040.00	P	3906.00	1.78
65 Cu	105160.00	P	1633.00	1.55
66 Zn	71154.39	P	1661.00	2.33
72 Ge	789316.63	P	17990.00	2.28
75 As	79152.65	P	1684.00	2.13
77 Se	5142.67	P	164.10	3.19
79 Br	496.67	P	73.71	14.84
82 Se	6786.80	P	163.60	2.41
88 Sr	675766.63	P	14000.00	2.07
89 Y	1274857.00	A	14300.00	1.12
95 Mo	133156.70	P	4229.00	3.18
97 Mo	83553.33	P	3094.00	3.70
98 Mo	219343.20	P	3570.00	1.63
107 Ag	159882.20	P	2539.00	1.59
109 Ag	153826.70	P	2469.00	1.61
111 Cd	101955.40	P	2730.00	2.68
114 Cd	235283.30	P	6331.00	2.69
115 In	1486342.00	A	21840.00	1.47
118 Sn	256450.00	P	8796.00	3.43
121 Sb	380831.31	P	8368.00	2.20
123 Sb	297762.00	P	4168.00	1.40
135 Ba	92026.67	P	2584.00	2.81
137 Ba	162550.00	P	2621.00	1.61
139 La	1540459.00	A	51490.00	3.34
140 Ce	1491165.00	A	55180.00	3.70
199 Hg	2172.00	P	98.02	4.51
200 Hg	2988.67	P	93.09	3.11
202 Hg	3755.67	P	46.88	1.25
203 Tl	583903.31	P	10060.00	1.72
205 Tl	1393548.00	A	35790.00	2.57
206 Pb	464003.31	P	9407.00	2.03
207 Pb	429420.00	P	5916.00	1.38
208 Pb	1928683.00	P	34200.00	1.77
209 Bi	4744008.00	A	89680.00	1.89
232 Th	2333798.00	A	59150.00	2.53
238 U	2525266.00	A	31860.00	1.26

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	576190.00	1.55	609356.69	94.6	60 - 125	
72 Ge	789316.63	2.28	849473.38	92.9	60 - 125	
89 Y	1274856.60	1.12	1346571.10	94.7	60 - 125	
115 In	1486341.90	1.47	1630928.10	91.1	60 - 125	
209 Bi	4744007.50	1.89	5261894.50	90.2	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01049

Cal Std QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\008CALS.D\008CALS.D#
Date Acquired: Feb 14 2018 12:28 pm
Operator: JPV
Sample Name: 100 ppb Br std
Misc Info: ICPMS-200.8-W-D
Vial Number: 4307
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:28 pm
Sample Type: CalStd
Total Dil Factor: 1.00

QC&ISTD Elements

Element	CPS Mean		SD	RSD(%)
6 Li		P		
9 Be	152.22	P	40.32	26.49
11 B	1464.44	P	28.74	1.96
27 Al	2603.33	P	100.20	3.85
45 Sc	583766.69	P	5982.00	1.02
47 Ti	123.33	P	25.17	20.41
51 V	988.41	P	151.30	15.31
52 Cr	2803.33	P	229.00	8.17
53 Cr	166.67	P	37.86	22.72
55 Mn	873.33	P	104.10	11.92
57 Fe	6170.00	P	276.20	4.48
59 Co	916.67	P	63.51	6.93
60 Ni	360.00	P	70.00	19.44
62 Ni	136.67	P	41.63	30.46
63 Cu	1790.00	P	111.30	6.22
65 Cu	1003.33	P	68.07	6.78
66 Zn	1723.20	P	320.40	18.59
72 Ge	799606.63	P	17370.00	2.17
75 As	297.45	P	87.34	29.36
77 Se	64.67	P	9.87	15.26
79 Br	11763.33	P	391.70	3.33
82 Se	37.87	P	16.29	43.02
88 Sr	1050.00	P	95.39	9.08
89 Y	1264981.00	A	15390.00	1.22
95 Mo	1323.33	P	115.90	8.76
97 Mo	753.33	P	73.71	9.78
98 Mo	2153.60	P	25.50	1.18
107 Ag	2322.22	P	171.30	7.38
109 Ag	2243.33	P	213.80	9.53
111 Cd	677.79	P	37.96	5.60
114 Cd	226.10	P	4.54	2.01
115 In	1529382.00	A	47180.00	3.08
118 Sn	3930.00	P	641.60	16.33
121 Sb	1225.33	P	32.65	2.66
123 Sb	946.00	P	76.61	8.10
135 Ba	133.33	P	40.41	30.31
137 Ba	230.00	P	30.00	13.04
139 La	1233.33	P	213.90	17.34
140 Ce	1130.00	P	52.92	4.68
199 Hg	103.33	P	2.31	2.23
200 Hg	123.00	P	9.64	7.84
202 Hg	144.67	P	7.51	5.19
203 Tl	1573.33	P	220.30	14.00
205 Tl	3513.33	P	405.00	11.53
206 Pb	750.00	P	132.30	17.64
207 Pb	740.00	P	96.44	13.03
208 Pb	3123.33	P	342.00	10.95
209 Bi	4886939.00	A	103800.00	2.12
232 Th	18934.44	P	1516.00	8.01
238 U	4763.33	P	363.00	7.62

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	583766.69	1.02	609356.69	95.8	60 - 125	
72 Ge	799606.63	2.17	849473.38	94.1	60 - 125	
89 Y	1264981.10	1.22	1346571.10	93.9	60 - 125	
115 In	1529382.50	3.08	1630928.10	93.8	60 - 125	
209 Bi	4886939.00	2.12	5261894.50	92.9	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

--- :Element Failures --- :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

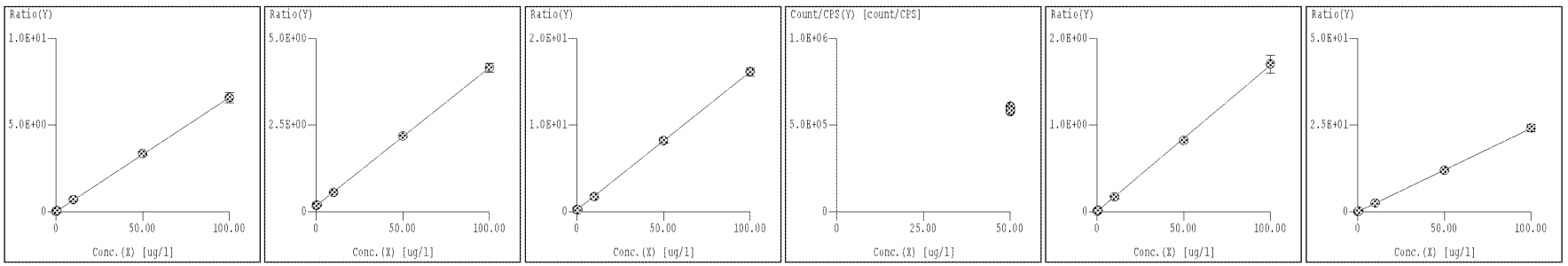
Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01050

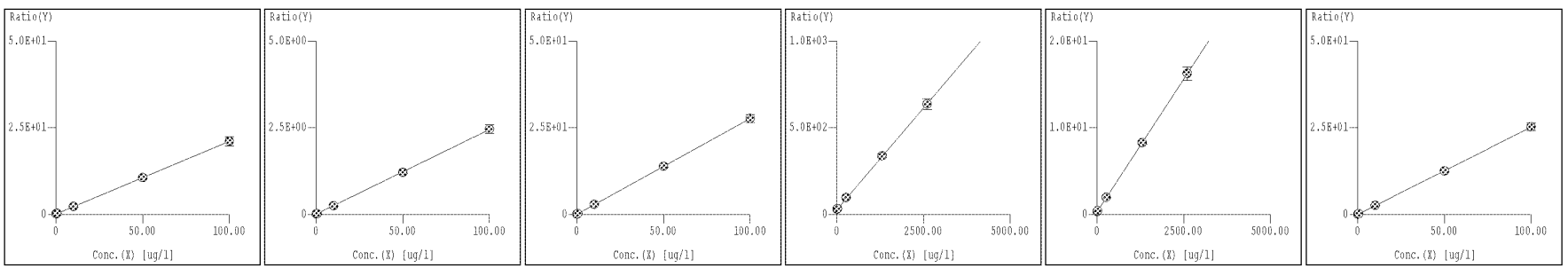
Calibration - C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C

=== Graph Summary ===
Page: 1/5

	(1) 9 Be	(1) 11 B	(1) 27 Al	(1) 45 Sc	(1) 47 Ti	(1) 51 V
< r >	1.0000	1.0000	1.0000	0.0000	0.9998	1.0000
< DL >	7.341E-02 ug/l	7.491E-01 ug/l	5.270 ug/l	--- ug/l	2.949E-01 ug/l	5.264E-02 ug/l
< BEC >	2.132E-01 ug/l	4.447 ug/l	1.423 ug/l	--- ug/l	3.720E-01 ug/l	2.050E-01 ug/l



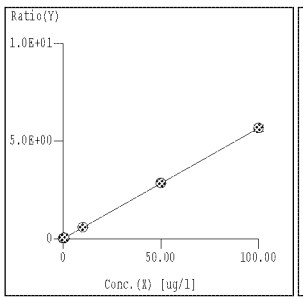
	(1) 52 Cr	(1) 53 Cr	(1) 55 Mn	(1) 56 Fe	(1) 57 Fe	(1) 59 Co
< r >	1.0000	1.0000	1.0000	0.9999	1.0000	1.0000
< DL >	6.270E-02 ug/l	2.167E-01 ug/l	3.654E-02 ug/l	5.366 ug/l	4.694 ug/l	6.835E-02 ug/l
< BEC >	7.582E-01 ug/l	4.912E-01 ug/l	2.492E-01 ug/l	128.6 ug/l	54.82 ug/l	2.131E-01 ug/l

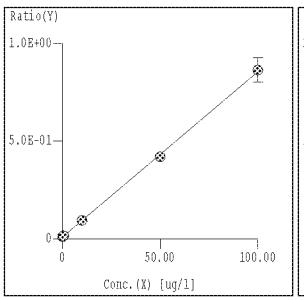


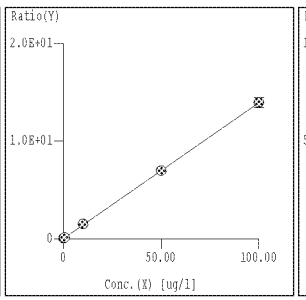
Calibration - C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C

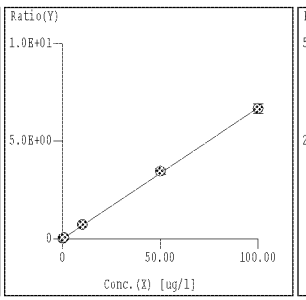
=== Graph Summary ===
Page: 2/5

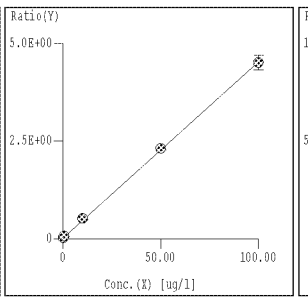
	(1) 60 Ni	(1) 62 Ni	(1) 63 Cu	(1) 65 Cu	(1) 66 Zn	(1) 67 Zn
< r >	1.0000	0.9998	1.0000	0.9998	0.9999	0.0000
< DL >	2.717E-01 ug/l	4.341E-01 ug/l	1.381E-01 ug/l	1.136E-01 ug/l	1.143E-01 ug/l	--- ug/l
< BEC >	2.197E-01 ug/l	1.159 ug/l	2.518E-01 ug/l	2.224E-01 ug/l	4.659E-01 ug/l	--- ug/l

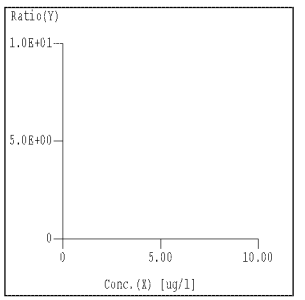




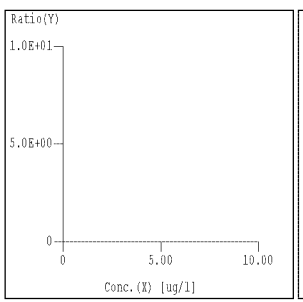


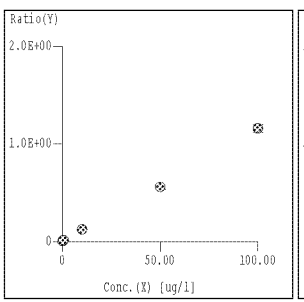


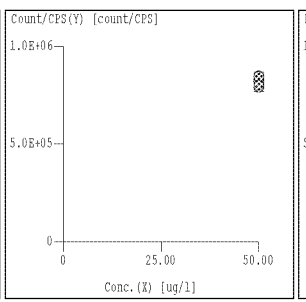


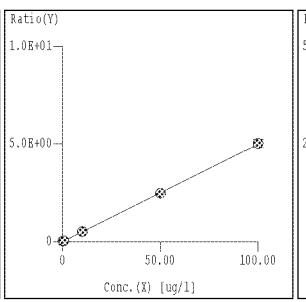


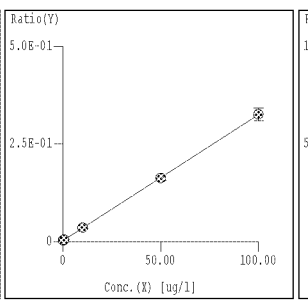
	(1) 68 Zn	(1) 69	(1) 72 Ge	(1) 75 As	(1) 77 Se	(1) 79 Br
< r >	0.0000	0.9998	0.0000	1.0000	1.0000	1.0000
< DL >	--- ug/l	--- ug/l	--- ug/l	1.531E-02 ug/l	1.276E-01 ug/l	9.912E-01 ug/l
< BEC >	--- ug/l	--- ug/l	--- ug/l	2.775E-01 ug/l	9.742E-01 ug/l	1.600 ug/l

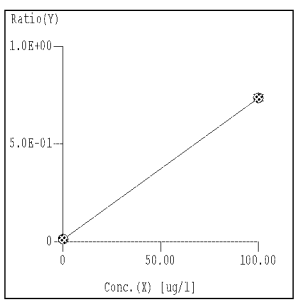








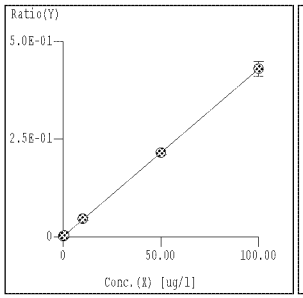


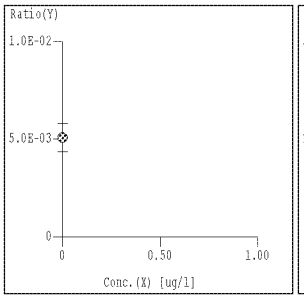


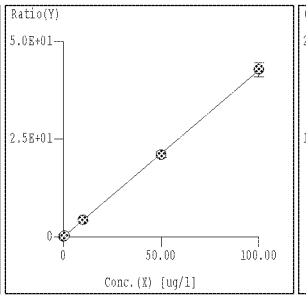
ED_004985_00011411-01052

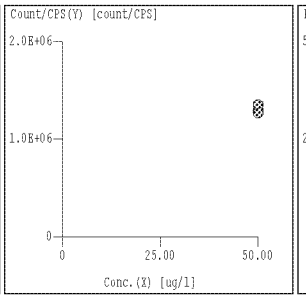
=== Graph Summary ===
Page: 3/5

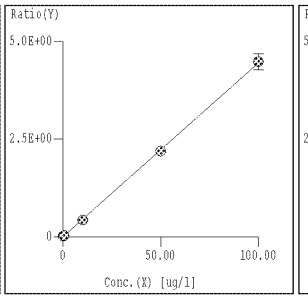
	(1) 82 Se	(1) 83 Kr	(1) 88 Sr	(1) 89 Y	(1) 95 Mo	(1) 97 Mo
< r >	1.0000	0.0000	0.9999	0.0000	0.9999	0.9999
< DL >	1.920E-01 ug/l	--- ug/l	4.024E-02 ug/l	--- ug/l	2.225E-01 ug/l	1.208E-01 ug/l
< BEC >	3.193E-01 ug/l	--- ug/l	1.032E-01 ug/l	--- ug/l	2.018E-01 ug/l	2.313E-01 ug/l

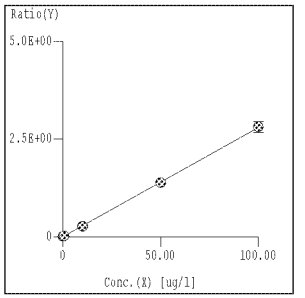




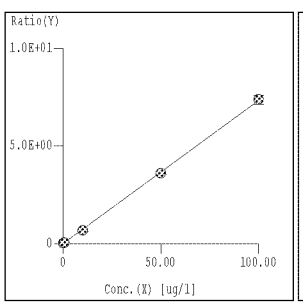


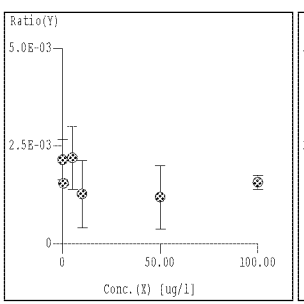


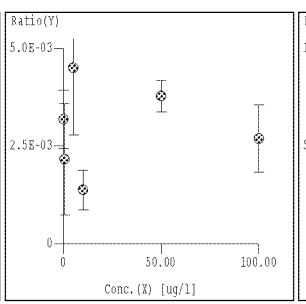


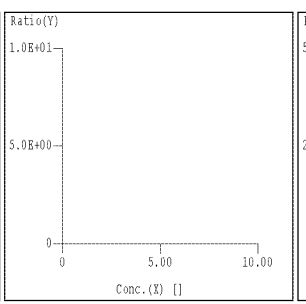


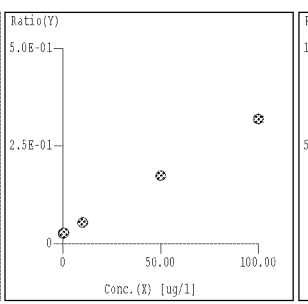
	(1) 98 Mo	(1) 99 Ru	(1) 102	(1) 103 Rh	(1) 106 (Cd)	(1) 107 Ag
< r >	0.9999	-0.3781	0.0313	0.0000	1.0000	0.9999
< DL >	1.004E-01 ug/l	--- ug/l	--- ug/l	---	--- ug/l	3.187E-02 ug/l
< BEC >	2.309E-01 ug/l	--- ug/l	--- ug/l	---	--- ug/l	1.084E-01 ug/l

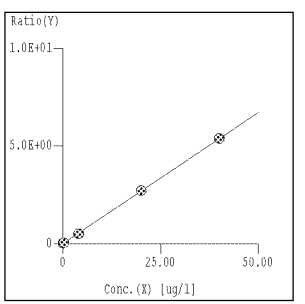






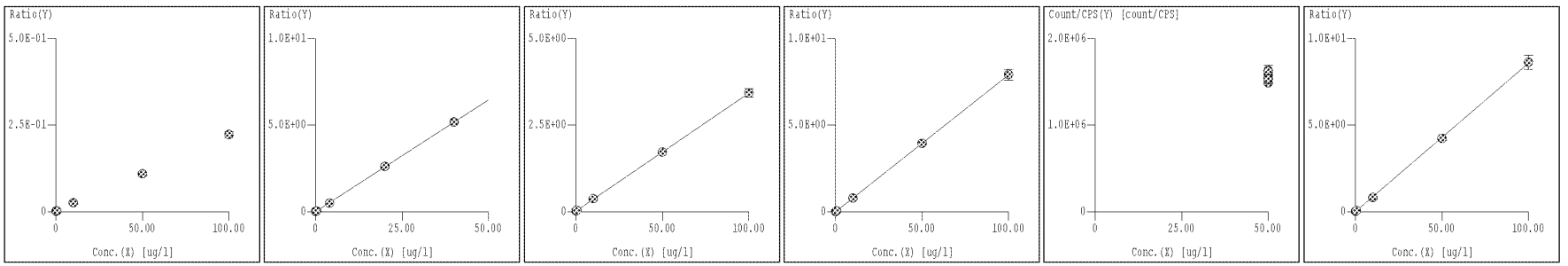




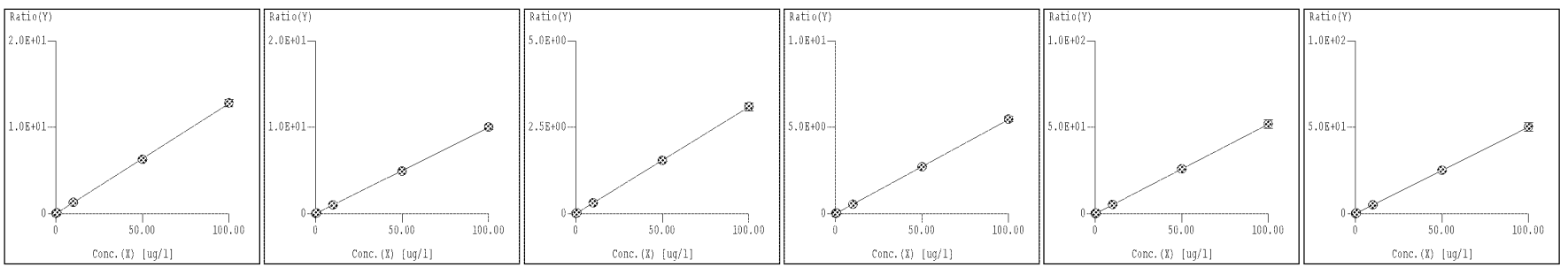


=== Graph Summary ===
Page: 4/5

	(1) 108 (Cd)	(1) 109 Ag	(1) 111 Cd	(1) 114 Cd	(1) 115 In	(1) 118 Sn
< r >	0.9998	1.0000	1.0000	1.0000	0.0000	0.9999
< DL >	--- ug/l	2.670E-02 ug/l	1.469E-01 ug/l	1.032E-01 ug/l	--- ug/l	4.996E-02 ug/l
< BEC >	--- ug/l	1.137E-01 ug/l	6.238E-01 ug/l	8.647E-02 ug/l	--- ug/l	2.095E-01 ug/l



	(1) 121 Sb	(1) 123 Sb	(1) 135 Ba	(1) 137 Ba	(1) 139 La	(1) 140 Ce
< r >	0.9999	1.0000	1.0000	1.0000	1.0000	1.0000
< DL >	6.727E-02 ug/l	8.267E-02 ug/l	2.430E-02 ug/l	7.046E-02 ug/l	2.687E-03 ug/l	4.886E-03 ug/l
< BEC >	1.541E-01 ug/l	1.561E-01 ug/l	1.159E-01 ug/l	1.203E-01 ug/l	1.385E-03 ug/l	2.878E-03 ug/l



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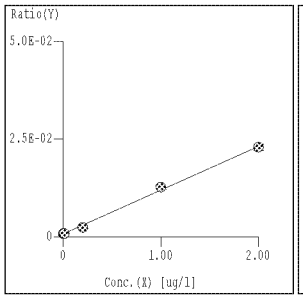
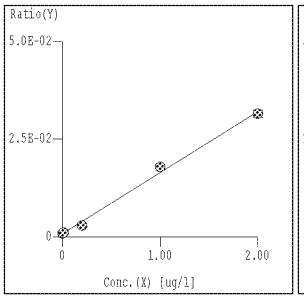
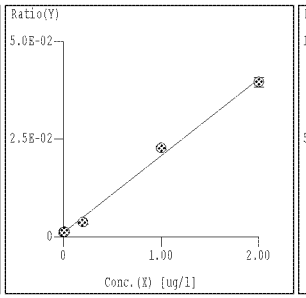
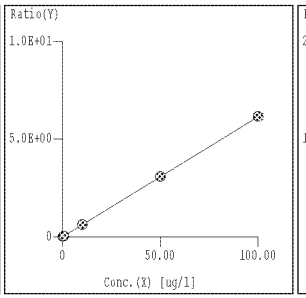
=== Graph Summary ===
Page: 5/5

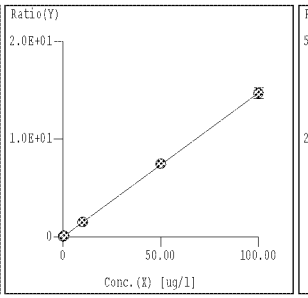
	(1) 199 Hg	(1) 200 Hg	(1) 202 Hg	(1) 203 Tl	(1) 205 Tl	(1) 206 Pb
< r >	0.9987	0.9976	0.9973	1.0000	1.0000	1.0000
< DL >	1.937E-02 ug/l	1.942E-02 ug/l	2.238E-02 ug/l	3.502E-02 ug/l	4.259E-02 ug/l	1.019E-01 ug/l
< BEC >	6.852E-02 ug/l	5.301E-02 ug/l	5.641E-02 ug/l	1.178E-01 ug/l	1.185E-01 ug/l	1.478E-01 ug/l

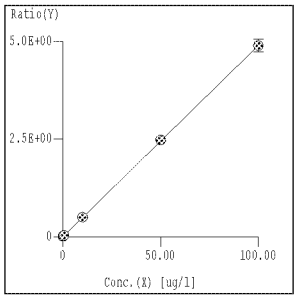




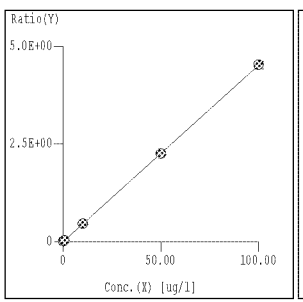


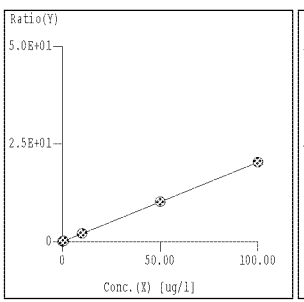


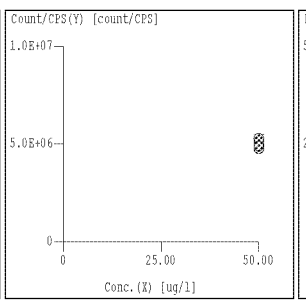


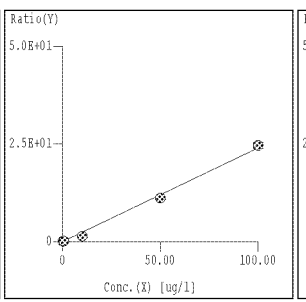


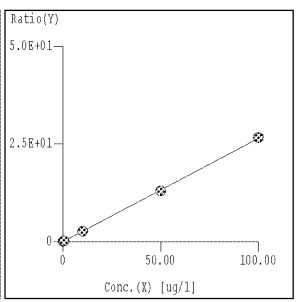
	(1) 207 Pb	(1) 208 Pb	(1) 209 Bi	(1) 232 Th	(1) 238 U
< r >	1.0000	1.0000	0.0000	0.9983	0.9999
< DL >	9.215E-02 ug/l	6.101E-02 ug/l	--- ug/l	6.156E-02 ug/l	3.867E-02 ug/l
< BEC >	1.454E-01 ug/l	1.290E-01 ug/l	--- ug/l	2.105E-01 ug/l	1.479E-01 ug/l











ED_004985_00011411-01055

ICV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\009ICV.D\009ICV.D#
Date Acquired: Feb 14 2018 12:31 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: **QCS**
Misc Info: ICPMS-200.8-W-D
Vial Number: 4101
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: ICV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range(%)	Flag
9 Be	25.550	ug/l	2.65	25.00	90 - 110	
11 B	50.450	ug/l	1.79	50.00	90 - 110	
27 Al	255.400	ug/l	0.77	250.00	90 - 110	
47 Ti	51.430	ug/l	3.49	50.00	90 - 110	
51 V	49.470	ug/l	2.24	50.00	90 - 110	
52 Cr	50.940	ug/l	2.02	50.00	90 - 110	
53 Cr	51.770	ug/l	4.77	50.00	90 - 110	
55 Mn	259.400	ug/l	1.98	250.00	90 - 110	
57 Fe	259.300	ug/l	3.80	250.00	90 - 110	
59 Co	51.520	ug/l	2.26	50.00	90 - 110	
60 Ni	52.360	ug/l	2.64	50.00	90 - 110	
62 Ni	52.060	ug/l	1.79	50.00	90 - 110	
63 Cu	51.700	ug/l	2.56	50.00	90 - 110	
65 Cu	52.620	ug/l	2.54	50.00	90 - 110	
66 Zn	52.610	ug/l	0.91	50.00	90 - 110	
75 As	49.980	ug/l	2.40	50.00	90 - 110	
77 Se	52.120	ug/l	2.29	50.00	90 - 110	
79 Br	3.163	ug/l	29.33	---	##### - #####	
82 Se	52.490	ug/l	3.05	50.00	90 - 110	
88 Sr	49.790	ug/l	2.34	50.00	90 - 110	
95 Mo	47.460	ug/l	1.74	50.00	90 - 110	
97 Mo	48.130	ug/l	2.85	50.00	90 - 110	
98 Mo	47.830	ug/l	2.76	50.00	90 - 110	
107 Ag	25.570	ug/l	2.92	25.00	90 - 110	
109 Ag	25.950	ug/l	0.78	25.00	90 - 110	
111 Cd	25.060	ug/l	2.57	25.00	90 - 110	
114 Cd	25.140	ug/l	2.22	25.00	90 - 110	
118 Sn	50.190	ug/l	3.08	50.00	90 - 110	
121 Sb	49.440	ug/l	1.87	50.00	90 - 110	
123 Sb	49.750	ug/l	2.12	50.00	90 - 110	
135 Ba	48.350	ug/l	3.05	50.00	90 - 110	
137 Ba	48.150	ug/l	1.08	50.00	90 - 110	
139 La	49.980	ug/l	1.94	50.00	90 - 110	
140 Ce	49.980	ug/l	2.32	50.00	90 - 110	
199 Hg	2.051	ug/l	3.58	2.00	90 - 110	
200 Hg	2.004	ug/l	2.50	2.00	90 - 110	
202 Hg	2.086	ug/l	0.89	2.00	90 - 110	
203 Tl	49.620	ug/l	1.44	50.00	90 - 110	
205 Tl	50.540	ug/l	1.26	50.00	90 - 110	
206 Pb	50.340	ug/l	2.32	50.00	90 - 110	
207 Pb	50.640	ug/l	2.11	50.00	90 - 110	
208 Pb	50.440	ug/l	1.88	50.00	90 - 110	
232 Th	21.770	ug/l	0.78	20.00	90 - 110	
238 U	19.550	ug/l	1.67	20.00	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	617423.31	1.37	609356.69	101.3	60 - 125	
72 Ge	838370.00	1.97	849473.38	98.7	60 - 125	
89 Y	1344315.50	3.37	1346571.10	99.8	60 - 125	
115 In	1611048.00	2.71	1630928.10	98.8	60 - 125	
209 Bi	5072169.00	2.78	5261894.50	96.4	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\010CCV.D\010CCV.D#
Date Acquired: Feb 14 2018 12:34 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	49.650	ug/l	4.66	50.00	85 - 115	90 - 110	
11 B	48.360	ug/l	2.44	50.00	85 - 115	90 - 110	
27 Al	48.860	ug/l	3.02	50.00	85 - 115	90 - 110	
47 Ti	50.880	ug/l	2.90	50.00	85 - 115	90 - 110	
51 V	49.710	ug/l	2.41	50.00	85 - 115	90 - 110	
52 Cr	49.250	ug/l	2.84	50.00	85 - 115	90 - 110	
53 Cr	49.180	ug/l	6.64	50.00	85 - 115	90 - 110	
55 Mn	50.140	ug/l	2.15	50.00	85 - 115	90 - 110	
57 Fe	1300.000	ug/l	2.91	1300.00	85 - 115	90 - 110	
59 Co	50.370	ug/l	3.15	50.00	85 - 115	90 - 110	
60 Ni	49.490	ug/l	1.42	50.00	85 - 115	90 - 110	
62 Ni	49.470	ug/l	5.09	50.00	85 - 115	90 - 110	
63 Cu	50.360	ug/l	1.95	50.00	85 - 115	90 - 110	
65 Cu	50.890	ug/l	4.44	50.00	85 - 115	90 - 110	
66 Zn	49.650	ug/l	2.55	50.00	85 - 115	90 - 110	
75 As	49.570	ug/l	3.29	50.00	85 - 115	90 - 110	
77 Se	50.300	ug/l	3.24	50.00	85 - 115	90 - 110	
79 Br	1.953	ug/l	32.75		--- #### - ####	#### - ####	
82 Se	49.940	ug/l	2.83	50.00	85 - 115	90 - 110	
88 Sr	49.580	ug/l	2.23	50.00	85 - 115	90 - 110	
95 Mo	49.190	ug/l	3.05	50.00	85 - 115	90 - 110	
97 Mo	50.500	ug/l	4.29	50.00	85 - 115	90 - 110	
98 Mo	49.930	ug/l	5.07	50.00	85 - 115	90 - 110	
107 Ag	19.970	ug/l	3.27	20.00	85 - 115	90 - 110	
109 Ag	20.080	ug/l	2.69	20.00	85 - 115	90 - 110	
111 Cd	48.990	ug/l	4.36	50.00	85 - 115	90 - 110	
114 Cd	48.880	ug/l	5.22	50.00	85 - 115	90 - 110	
118 Sn	49.960	ug/l	5.97	50.00	85 - 115	90 - 110	
121 Sb	48.580	ug/l	5.08	50.00	85 - 115	90 - 110	
123 Sb	48.630	ug/l	4.51	50.00	85 - 115	90 - 110	
135 Ba	48.450	ug/l	5.13	50.00	85 - 115	90 - 110	
137 Ba	47.290	ug/l	4.30	50.00	85 - 115	90 - 110	
139 La	49.040	ug/l	4.65	50.00	85 - 115	90 - 110	
140 Ce	49.540	ug/l	5.60	50.00	85 - 115	90 - 110	
199 Hg	1.068	ug/l	6.70	1.00	85 - 115	90 - 110	
200 Hg	1.052	ug/l	5.25	1.00	85 - 115	90 - 110	
202 Hg	1.075	ug/l	2.30	1.00	85 - 115	90 - 110	
203 Tl	49.330	ug/l	3.91	50.00	85 - 115	90 - 110	
205 Tl	49.870	ug/l	2.39	50.00	85 - 115	90 - 110	
206 Pb	50.070	ug/l	3.13	50.00	85 - 115	90 - 110	
207 Pb	49.440	ug/l	2.14	50.00	85 - 115	90 - 110	
208 Pb	49.520	ug/l	2.40	50.00	85 - 115	90 - 110	
232 Th	47.370	ug/l	2.08	50.00	85 - 115	90 - 110	
238 U	49.140	ug/l	3.12	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	606463.31	2.15	609356.69	99.5	60 - 125	
72 Ge	835243.38	1.21	849473.38	98.3	60 - 125	
89 Y	1338598.80	0.96	1346571.10	99.4	60 - 125	
115 In	1591179.60	3.10	1630928.10	97.6	60 - 125	
209 Bi	4992486.50	1.80	5261894.50	94.9	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

QC Range 1
0 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
0 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01057

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\011SMPL.D\011SMPL.D#
Date Acquired: Feb 14 2018 12:36 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.070	-0.070	ug/l	12.08	4500.00	113.33		P
11 B	-2.349	-2.349	ug/l	8.70	4500.00	1002.22		P
27 Al	-0.983	-0.983	ug/l	7.73	4500.00	843.33		P
47 Ti	-0.049	-0.049	ug/l	284.07	4500.00	90.00		P
51 V	0.036	0.036	ug/l	208.21	4500.00	953.57		P
52 Cr	0.071	0.071	ug/l	87.12	4500.00	2853.33		P
53 Cr	-0.090	-0.090	ug/l	180.02	4500.00	160.00		P
55 Mn	-0.012	-0.012	ug/l	188.50	4500.00	1076.67		P
57 Fe	3.873	3.873	ug/l	99.61	4500.00	5906.67		P
59 Co	-0.024	-0.024	ug/l	6.14	4500.00	780.00		P
60 Ni	-0.044	-0.044	ug/l	63.21	4500.00	163.33		P
62 Ni	-0.253	-0.253	ug/l	164.14	4500.00	126.67		P
63 Cu	-0.066	-0.066	ug/l	69.13	4500.00	423.33		P
65 Cu	-0.023	-0.023	ug/l	177.35	4500.00	220.00		P
66 Zn	-0.318	-0.318	ug/l	12.59	4500.00	109.90		P
75 As	-0.007	-0.007	ug/l	506.73	4500.00	221.54		P
77 Se	0.238	0.238	ug/l	97.15	4500.00	64.00		P
79 Br	0.448	0.448	ug/l	---	#VALUE!	243.33		P
82 Se	0.047	0.047	ug/l	536.33	4500.00	25.60		P
88 Sr	-0.006	-0.006	ug/l	221.82	4500.00	676.67		P
95 Mo	0.508	0.508	ug/l	17.56	4500.00	990.00		P
97 Mo	0.476	0.476	ug/l	12.90	4500.00	620.00		P
98 Mo	0.414	0.414	ug/l	11.26	4500.00	1480.19		P
107 Ag	0.209	0.209	ug/l	10.13	1800.00	1334.44		P
109 Ag	0.215	0.215	ug/l	4.76	1800.00	1331.11		P
111 Cd	0.045	0.045	ug/l	63.21	4500.00	714.22		P
114 Cd	-0.034	-0.034	ug/l	31.59	4500.00	128.97		P
118 Sn	0.970	0.970	ug/l	7.58	4500.00	3170.00		P
121 Sb	0.173	0.173	ug/l	5.20	4500.00	1307.67		P
123 Sb	0.184	0.184	ug/l	5.13	4500.00	1062.67		P
135 Ba	-0.013	-0.013	ug/l	199.07	4500.00	100.00		P
137 Ba	-0.019	-0.019	ug/l	147.67	4500.00	173.33		P
139 La	0.064	0.064	ug/l	11.21	4500.00	1066.67		P
140 Ce	0.073	0.073	ug/l	13.79	4500.00	1196.67		P
199 Hg	0.026	0.026	ug/l	32.38	450.00	106.33		P
200 Hg	0.035	0.035	ug/l	42.55	450.00	139.33		P
202 Hg	0.017	0.017	ug/l	8.50	450.00	145.67		P
203 Tl	0.049	0.049	ug/l	41.60	4500.00	1033.33		P
205 Tl	0.051	0.051	ug/l	54.19	4500.00	2503.33		P
206 Pb	-0.016	-0.016	ug/l	57.33	4500.00	646.67		P
207 Pb	-0.036	-0.036	ug/l	41.65	4500.00	496.67		P
208 Pb	-0.024	-0.024	ug/l	19.65	4500.00	2143.33		P
232 Th	0.458	0.458	ug/l	6.50	4500.00	16133.33		P
238 U	-0.029	-0.029	ug/l	6.58	4500.00	3153.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	599750.00	1.81	609356.69	98.4	60.000002	-	125
72 Ge	821230.00	1.83	849473.38	96.7	60.000002	-	125
89 Y	1314021.30	2.10	1346571.10	97.6	60.000002	-	125
115 In	1567705.80	1.41	1630928.10	96.1	60.000002	-	125
209 Bi	5032006.00	1.19	5261894.50	95.6	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01058

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\012_CCB.D\012_CCB.D#
Date Acquired: Feb 14 2018 12:39 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:30 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	-0.080	ug/l	11.04	0.09	
11 B	-2.494	ug/l	4.32	1.18	
27 Al	-1.056	ug/l	3.78	0.38	
47 Ti	-0.064	ug/l	205.75	0.17	
51 V	0.000	ug/l	40800.00	0.09	
52 Cr	0.049	ug/l	138.13	0.12	
53 Cr	-0.085	ug/l	20.24	0.13	
55 Mn	-0.050	ug/l	23.40	0.14	
57 Fe	4.014	ug/l	55.53	4.00	Fail
59 Co	-0.068	ug/l	50.35	0.04	
60 Ni	-0.086	ug/l	39.94	0.08	
62 Ni	-0.241	ug/l	115.38	0.32	
63 Cu	-0.087	ug/l	39.76	0.09	
65 Cu	-0.022	ug/l	327.28	0.22	
66 Zn	-0.155	ug/l	41.32	0.10	
75 As	-0.023	ug/l	110.78	0.12	
77 Se	-0.026	ug/l	335.03	1.22	
79 Br	-0.089	ug/l	398.77	#VALUE!	
82 Se	-0.146	ug/l	107.32	0.32	
88 Sr	-0.050	ug/l	22.40	0.05	
95 Mo	0.132	ug/l	102.50	0.05	Fail
97 Mo	0.160	ug/l	52.29	0.03	Fail
98 Mo	0.087	ug/l	23.67	0.03	Fail
107 Ag	0.081	ug/l	16.89	0.09	
109 Ag	0.075	ug/l	35.01	0.10	
111 Cd	-0.006	ug/l	1427.90	0.03	
114 Cd	-0.055	ug/l	4.59	0.03	
118 Sn	0.422	ug/l	13.98	0.05	Fail
121 Sb	0.043	ug/l	18.49	0.03	Fail
123 Sb	0.037	ug/l	30.43	0.04	Fail
135 Ba	-0.065	ug/l	27.88	0.09	
137 Ba	-0.072	ug/l	18.67	0.08	
139 La	0.041	ug/l	5.26	0.02	Fail
140 Ce	0.037	ug/l	8.11	0.02	Fail
199 Hg	0.012	ug/l	13.75	0.03	
200 Hg	0.016	ug/l	23.35	0.03	
202 Hg	0.016	ug/l	48.01	0.03	
203 Tl	-0.020	ug/l	52.11	0.03	
205 Tl	-0.025	ug/l	39.73	0.02	
206 Pb	-0.055	ug/l	38.13	#VALUE!	
207 Pb	-0.062	ug/l	8.09	#VALUE!	
208 Pb	-0.054	ug/l	13.18	0.02	
232 Th	0.182	ug/l	18.37	0.06	Fail
238 U	-0.061	ug/l	12.66	0.02	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	613816.69	2.42	609356.69	100.7	60 - 125	
72 Ge	840766.63	2.70	849473.38	99.0	60 - 125	
89 Y	1352101.10	0.88	1346571.10	100.4	60 - 125	
115 In	1584236.90	2.12	1630928.10	97.1	60 - 125	
209 Bi	4991506.00	2.82	5261894.50	94.9	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

10 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01059

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\013SMPL.D\013SMPL.D#
Date Acquired: Feb 14 2018 12:42 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: LRB
Misc Info: ICPMS-200.8-W-D
Vial Number: 3101
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.092	-0.092	ug/l	10.87	4500.00	98.89		P
11 B	-2.943	-2.943	ug/l	2.47	4500.00	741.11		P
27 Al	-0.899	-0.899	ug/l	9.53	4500.00	1033.33		P
47 Ti	-0.126	-0.126	ug/l	25.62	4500.00	70.00		P
51 V	-0.028	-0.028	ug/l	217.12	4500.00	714.80		P
52 Cr	-0.008	-0.008	ug/l	979.86	4500.00	2646.67		P
53 Cr	-0.120	-0.120	ug/l	80.78	4500.00	153.33		P
55 Mn	-0.070	-0.070	ug/l	11.77	4500.00	833.33		P
57 Fe	2.807	2.807	ug/l	113.61	4500.00	5950.00		P
59 Co	-0.065	-0.065	ug/l	27.86	4500.00	626.67		P
60 Ni	-0.122	-0.122	ug/l	13.48	4500.00	93.33		P
62 Ni	-0.271	-0.271	ug/l	33.26	4500.00	126.67		P
63 Cu	-0.124	-0.124	ug/l	15.00	4500.00	300.00		P
65 Cu	-0.119	-0.119	ug/l	15.36	4500.00	116.67		P
66 Zn	-0.198	-0.198	ug/l	44.82	4500.00	203.26		P
75 As	-0.026	-0.026	ug/l	33.94	4500.00	211.28		P
77 Se	-0.139	-0.139	ug/l	102.66	4500.00	45.33		P
79 Br	-0.014	-0.014	ug/l	---	#VALUE!	193.33		P
82 Se	-0.052	-0.052	ug/l	339.95	4500.00	19.33		P
88 Sr	-0.044	-0.044	ug/l	25.00	4500.00	426.67		P
95 Mo	0.000	0.000	ug/l	31284.00	4500.00	293.33		P
97 Mo	0.036	0.036	ug/l	94.95	4500.00	243.33		P
98 Mo	-0.051	-0.051	ug/l	105.04	4500.00	427.83		P
107 Ag	0.021	0.021	ug/l	26.25	1800.00	565.56		P
109 Ag	0.003	0.003	ug/l	194.49	1800.00	488.89		P
111 Cd	-0.039	-0.039	ug/l	141.97	4500.00	647.80		P
114 Cd	-0.059	-0.059	ug/l	19.62	4500.00	72.06		P
118 Sn	0.255	0.255	ug/l	22.73	4500.00	1296.67		P
121 Sb	-0.022	-0.022	ug/l	25.87	4500.00	547.67		P
123 Sb	-0.016	-0.016	ug/l	35.03	4500.00	454.33		P
135 Ba	-0.062	-0.062	ug/l	35.87	4500.00	53.33		P
137 Ba	-0.075	-0.075	ug/l	27.51	4500.00	80.00		P
139 La	0.027	0.027	ug/l	8.66	4500.00	483.33		P
140 Ce	0.027	0.027	ug/l	15.30	4500.00	483.33		P
199 Hg	0.024	0.024	ug/l	48.71	450.00	106.00		P
200 Hg	0.018	0.018	ug/l	30.79	450.00	112.67		P
202 Hg	0.006	0.006	ug/l	142.51	450.00	125.33		P
203 Tl	-0.053	-0.053	ug/l	22.42	4500.00	403.33		P
205 Tl	-0.057	-0.057	ug/l	6.92	4500.00	930.00		P
206 Pb	-0.083	-0.083	ug/l	16.40	4500.00	323.33		P
207 Pb	-0.080	-0.080	ug/l	10.32	4500.00	303.33		P
208 Pb	-0.074	-0.074	ug/l	6.26	4500.00	1150.00		P
232 Th	0.054	0.054	ug/l	22.95	4500.00	6476.67		P
238 U	-0.070	-0.070	ug/l	5.14	4500.00	2113.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	618396.69	0.38	609356.69	101.5	60.000002	-	125
72 Ge	843123.38	1.16	849473.38	99.3	60.000002	-	125
89 Y	1364391.40	1.54	1346571.10	101.3	60.000002	-	125
115 In	1624926.30	3.56	1630928.10	99.6	60.000002	-	125
209 Bi	5107448.50	2.79	5261894.50	97.1	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01060

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\014SMPL.D\014SMPL.D#
Date Acquired: Feb 14 2018 12:44 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: LLRV
Misc Info: ICPMS-200.8-W-D
Vial Number: 4102
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.457	0.457	ug/l	21.19	4500.00	536.67		P
11 B	-1.000	-1.000	ug/l	6.85	4500.00	1671.11		P
27 Al	9.566	9.566	ug/l	1.05	4500.00	21303.33		P
47 Ti	0.767	0.767	ug/l	20.72	4500.00	320.00		P
51 V	1.954	1.954	ug/l	5.11	4500.00	8646.01		P
52 Cr	1.126	1.126	ug/l	10.87	4500.00	6566.67		P
53 Cr	0.970	0.970	ug/l	29.31	4500.00	593.33		P
55 Mn	0.380	0.380	ug/l	2.69	4500.00	2896.67		P
57 Fe	1.655	1.655	ug/l	111.60	4500.00	5763.33		P
59 Co	0.126	0.126	ug/l	15.56	4500.00	1420.00		P
60 Ni	2.112	2.112	ug/l	4.83	4500.00	2196.67		P
62 Ni	2.041	2.041	ug/l	31.67	4500.00	450.00		P
63 Cu	1.977	1.977	ug/l	9.28	4500.00	5170.00		P
65 Cu	2.053	2.053	ug/l	12.23	4500.00	2536.67		P
66 Zn	6.318	6.318	ug/l	2.83	4500.00	5096.48		P
75 As	0.915	0.915	ug/l	1.66	4500.00	990.94		P
77 Se	1.966	1.966	ug/l	9.99	4500.00	157.67		P
79 Br	-0.246	-0.246	ug/l	---	#VALUE!	163.33		P
82 Se	1.708	1.708	ug/l	14.19	4500.00	144.93		P
88 Sr	0.432	0.432	ug/l	12.30	4500.00	3796.67		P
95 Mo	0.451	0.451	ug/l	7.01	4500.00	940.00		P
97 Mo	0.484	0.484	ug/l	23.23	4500.00	646.67		P
98 Mo	0.407	0.407	ug/l	22.53	4500.00	1509.85		P
107 Ag	0.124	0.124	ug/l	8.99	1800.00	1010.00		P
109 Ag	0.126	0.126	ug/l	7.04	1800.00	1003.33		P
111 Cd	0.172	0.172	ug/l	6.84	4500.00	878.81		P
114 Cd	0.119	0.119	ug/l	16.99	4500.00	524.80		P
118 Sn	1.146	1.146	ug/l	7.93	4500.00	3760.00		P
121 Sb	0.333	0.333	ug/l	3.11	4500.00	2007.33		P
123 Sb	0.341	0.341	ug/l	5.88	4500.00	1604.00		P
135 Ba	0.174	0.174	ug/l	7.32	4500.00	290.00		P
137 Ba	0.195	0.195	ug/l	13.82	4500.00	556.67		P
139 La	0.216	0.216	ug/l	11.03	4500.00	3640.00		P
140 Ce	0.211	0.211	ug/l	4.31	4500.00	3470.00		P
199 Hg	0.977	0.977	ug/l	15.06	450.00	1196.33		P
200 Hg	0.948	0.948	ug/l	14.44	450.00	1598.00		P
202 Hg	0.961	0.961	ug/l	10.53	450.00	2043.00		P
203 Tl	0.620	0.620	ug/l	2.63	4500.00	4633.33		P
205 Tl	0.624	0.624	ug/l	4.63	4500.00	11170.00		P
206 Pb	0.452	0.452	ug/l	10.56	4500.00	2996.67		P
207 Pb	0.417	0.417	ug/l	8.60	4500.00	2593.33		P
208 Pb	0.447	0.447	ug/l	6.01	4500.00	11956.67		P
232 Th	5.704	5.704	ug/l	12.06	4500.00	144906.70		P
238 U	0.408	0.408	ug/l	2.78	4500.00	15010.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	608170.00	1.60	609356.69	99.8	60.000002	-	125
72 Ge	833073.38	2.29	849473.38	98.1	60.000002	-	125
89 Y	1340022.60	0.40	1346571.10	99.5	60.000002	-	125
115 In	1619800.60	1.84	1630928.10	99.3	60.000002	-	125
209 Bi	5107065.00	0.35	5261894.50	97.1	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01061

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\015SMPL.D\015SMPL.D#
Date Acquired: Feb 14 2018 12:47 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: LFB
Misc Info: ICPMS-200.8-W-D
Vial Number: 3102
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.02
Autodil Factor: Undiluted
Final Dil Factor: 1.02

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	49.501	48.530	ug/l	3.74	4500.00	37722.22		P
11 B	46.053	45.150	ug/l	3.60	4500.00	23224.44		P
27 Al	47.032	46.110	ug/l	3.14	4500.00	89003.33		P
47 Ti	56.069	54.970	ug/l	5.35	4500.00	14796.67		P
51 V	50.021	49.040	ug/l	4.46	4500.00	187663.41		P
52 Cr	49.919	48.940	ug/l	5.15	4500.00	165060.00		P
53 Cr	50.857	49.860	ug/l	4.36	4500.00	19496.67		P
55 Mn	49.113	48.150	ug/l	5.96	4500.00	211973.30		P
57 Fe	4,854.180	4759.000	ug/l	5.20	4500.00	467610.00		P
59 Co	49.450	48.480	ug/l	4.82	4500.00	194210.00		P
60 Ni	49.062	48.100	ug/l	4.54	4500.00	43350.00		P
62 Ni	50.000	49.020	ug/l	6.99	4500.00	6733.33		P
63 Cu	48.532	47.580	ug/l	5.06	4500.00	105506.70		P
65 Cu	47.858	46.920	ug/l	3.80	4500.00	50103.33		P
66 Zn	48.328	47.380	ug/l	4.27	4500.00	34224.41		P
75 As	48.287	47.340	ug/l	4.82	4500.00	37644.19		P
77 Se	48.960	48.000	ug/l	3.85	4500.00	2501.67		P
79 Br	5.738	5.625	ug/l	---	#VALUE!	830.00		P
82 Se	47.063	46.140	ug/l	4.45	4500.00	3158.27		P
88 Sr	48.909	47.950	ug/l	4.59	4500.00	324743.31		P
95 Mo	49.164	48.200	ug/l	5.81	4500.00	62830.00		P
97 Mo	50.449	49.460	ug/l	6.03	4500.00	40506.67		P
98 Mo	48.756	47.800	ug/l	7.04	4500.00	102567.50		P
107 Ag	19.400	19.020	ug/l	4.75	1800.00	74913.33		P
109 Ag	19.513	19.130	ug/l	4.66	1800.00	72491.11		P
111 Cd	48.481	47.530	ug/l	5.59	4500.00	47888.58		P
114 Cd	48.011	47.070	ug/l	5.60	4500.00	108757.20		P
118 Sn	49.276	48.310	ug/l	8.25	4500.00	121270.00		P
121 Sb	48.215	47.270	ug/l	7.03	4500.00	176256.70		P
123 Sb	48.073	47.130	ug/l	6.79	4500.00	137437.70		P
135 Ba	47.930	46.990	ug/l	6.27	4500.00	42463.33		P
137 Ba	47.797	46.860	ug/l	7.45	4500.00	74700.00		P
139 La	48.787	47.830	ug/l	6.19	4500.00	723243.31		P
140 Ce	49.286	48.320	ug/l	6.52	4500.00	707536.63		P
199 Hg	1.074	1.053	ug/l	2.49	450.00	1119.67		P
200 Hg	1.073	1.052	ug/l	2.06	450.00	1539.00		P
202 Hg	1.080	1.059	ug/l	4.91	450.00	1955.00		P
203 Tl	48.919	47.960	ug/l	3.34	4500.00	263330.00		P
205 Tl	49.664	48.690	ug/l	2.66	4500.00	640196.69		P
206 Pb	49.888	48.910	ug/l	1.38	4500.00	213996.59		P
207 Pb	49.225	48.260	ug/l	1.57	4500.00	194723.30		P
208 Pb	49.511	48.540	ug/l	1.73	4500.00	881166.63		P
232 Th	51.877	50.860	ug/l	1.04	4500.00	1091301.00		P
238 U	49.123	48.160	ug/l	1.37	4500.00	1137904.00		M

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	587440.00	0.56	609356.69	96.4	60.000002	-	125
72 Ge	793240.00	1.42	849473.38	93.4	60.000002	-	125
89 Y	1259668.40	1.91	1346571.10	93.5	60.000002	-	125
115 In	1461259.50	3.48	1630928.10	89.6	60.000002	-	125
209 Bi	4454569.50	1.02	5261894.50	84.7	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01062

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\016SMPL.D\016SMPL.D#
Date Acquired: Feb 14 2018 12:49 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.073	-0.073	ug/l	36.90	4500.00	112.22		P
11 B	-3.077	-3.077	ug/l	1.92	4500.00	663.33		P
27 Al	-1.086	-1.086	ug/l	2.49	4500.00	650.00		P
47 Ti	0.113	0.113	ug/l	132.18	4500.00	136.67		P
51 V	-0.022	-0.022	ug/l	226.37	4500.00	737.68		P
52 Cr	0.002	0.002	ug/l	2290.10	4500.00	2666.67		P
53 Cr	-0.100	-0.100	ug/l	99.04	4500.00	160.00		P
55 Mn	-0.094	-0.094	ug/l	21.84	4500.00	716.67		P
57 Fe	8.194	8.194	ug/l	18.92	4500.00	6470.00		P
59 Co	-0.033	-0.033	ug/l	68.31	4500.00	756.67		P
60 Ni	-0.097	-0.097	ug/l	43.87	4500.00	116.67		P
62 Ni	-0.148	-0.148	ug/l	107.25	4500.00	143.33		P
63 Cu	-0.083	-0.083	ug/l	37.15	4500.00	393.33		P
65 Cu	-0.100	-0.100	ug/l	36.87	4500.00	136.67		P
66 Zn	-0.311	-0.311	ug/l	9.52	4500.00	116.56		P
75 As	-0.019	-0.019	ug/l	287.78	4500.00	216.20		P
77 Se	-0.080	-0.080	ug/l	115.00	4500.00	48.33		P
79 Br	0.298	0.298	ug/l	---	#VALUE!	230.00		P
82 Se	-0.057	-0.057	ug/l	314.29	4500.00	18.93		P
88 Sr	-0.055	-0.055	ug/l	4.83	4500.00	343.33		P
95 Mo	0.328	0.328	ug/l	7.20	4500.00	736.67		P
97 Mo	0.288	0.288	ug/l	0.46	4500.00	453.33		P
98 Mo	0.338	0.338	ug/l	12.05	4500.00	1302.07		P
107 Ag	0.181	0.181	ug/l	18.07	1800.00	1213.33		P
109 Ag	0.156	0.156	ug/l	17.58	1800.00	1087.78		P
111 Cd	-0.026	-0.026	ug/l	298.83	4500.00	635.43		P
114 Cd	-0.059	-0.059	ug/l	12.11	4500.00	67.29		P
118 Sn	0.659	0.659	ug/l	2.19	4500.00	2326.67		P
121 Sb	0.111	0.111	ug/l	10.86	4500.00	1055.67		P
123 Sb	0.116	0.116	ug/l	4.13	4500.00	847.33		P
135 Ba	-0.040	-0.040	ug/l	35.86	4500.00	73.33		P
137 Ba	-0.075	-0.075	ug/l	5.28	4500.00	76.67		P
139 La	0.046	0.046	ug/l	2.62	4500.00	773.33		P
140 Ce	0.042	0.042	ug/l	14.44	4500.00	703.33		P
199 Hg	0.021	0.021	ug/l	66.38	450.00	98.67		P
200 Hg	0.021	0.021	ug/l	26.63	450.00	114.33		P
202 Hg	0.016	0.016	ug/l	43.85	450.00	140.33		P
203 Tl	0.519	0.519	ug/l	42.25	4500.00	3840.00		P
205 Tl	0.472	0.472	ug/l	32.33	4500.00	8543.33		P
206 Pb	-0.026	-0.026	ug/l	121.06	4500.00	586.67		P
207 Pb	-0.025	-0.025	ug/l	103.00	4500.00	536.67		P
208 Pb	-0.014	-0.014	ug/l	191.52	4500.00	2303.33		P
232 Th	0.405	0.405	ug/l	7.95	4500.00	14590.00		P
238 U	-0.052	-0.052	ug/l	21.03	4500.00	2510.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	607356.69	2.01	609356.69	99.7	60.000002	-	125
72 Ge	838010.00	1.29	849473.38	98.7	60.000002	-	125
89 Y	1336411.90	0.50	1346571.10	99.2	60.000002	-	125
115 In	1563617.50	2.36	1630928.10	95.9	60.000002	-	125
209 Bi	4941566.00	3.03	5261894.50	93.9	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01063

QCS QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\017ICSA.D\017ICSA.D#
Date Acquired: Feb 14 2018 12:52 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: **ICSA**
Misc Info: ICPMS-200.8-W-D
Vial Number: 4106
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: ICSA
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range(%)	Flag
9 Be	-0.09	ug/l	53.11	---	##### - #####	
11 B	-2.61	ug/l	1.53	---	##### - #####	
27 Al	40280.00	ug/l	3.25	40000.00	70 - 130	
47 Ti	842.90	ug/l	2.68	800.00	70 - 130	
51 V	0.09	ug/l	65.64	---	##### - #####	
52 Cr	1.34	ug/l	11.03	---	##### - #####	
53 Cr	2.03	ug/l	21.34	---	##### - #####	
55 Mn	0.13	ug/l	2.73	---	##### - #####	
57 Fe	91280.00	ug/l	3.68	#########	70 - 130	
59 Co	0.01	ug/l	207.46	---	##### - #####	
60 Ni	0.98	ug/l	6.63	---	##### - #####	
62 Ni	1.79	ug/l	10.37	---	##### - #####	
63 Cu	1.92	ug/l	6.88	---	##### - #####	
65 Cu	0.88	ug/l	5.67	---	##### - #####	
66 Zn	1.54	ug/l	11.54	---	##### - #####	
69 (Zn)	--------	ug/l	--------	---	##### - #####	
75 As	0.03	ug/l	159.56	---	##### - #####	
77 Se	4.10	ug/l	3.21	---	##### - #####	
79 Br	5.79	ug/l	16.56	---	##### - #####	
82 Se	-0.01	ug/l	408.29	---	##### - #####	
83 Kr	--------	ug/l	--------	---	##### - #####	
88 Sr	0.43	ug/l	8.32	---	##### - #####	
95 Mo	820.40	ug/l	3.41	800.00	70 - 130	
97 Mo	837.80	ug/l	3.19	800.00	70 - 130	
98 Mo	821.80	ug/l	3.24	800.00	70 - 130	
99 Ru	--------	ug/l	--------	---	##### - #####	
102	--------	ug/l	--------	---	##### - #####	
103 Rh	--------		--------	---	##### - #####	
106 (Cd)	--------	ug/l	--------	---	##### - #####	
107 Ag	0.17	ug/l	22.17	---	##### - #####	
108 (Cd)	--------	ug/l	--------	---	##### - #####	
109 Ag	0.16	ug/l	26.56	---	##### - #####	
111 Cd	-0.01	ug/l	507.43	---	##### - #####	
114 Cd	-0.05	ug/l	80.27	---	##### - #####	
118 Sn	0.47	ug/l	33.49	---	##### - #####	
121 Sb	0.13	ug/l	8.99	---	##### - #####	
123 Sb	0.13	ug/l	8.71	---	##### - #####	
135 Ba	0.02	ug/l	166.21	---	##### - #####	
137 Ba	-0.02	ug/l	93.68	---	##### - #####	
139 La	0.03	ug/l	15.37	---	##### - #####	
140 Ce	0.04	ug/l	16.59	---	##### - #####	
199 Hg	0.02	ug/l	84.64	---	##### - #####	
200 Hg	0.03	ug/l	44.62	---	##### - #####	
202 Hg	0.02	ug/l	63.41	---	##### - #####	
203 Tl	0.50	ug/l	23.47	---	##### - #####	
205 Tl	0.53	ug/l	26.97	---	##### - #####	
206 Pb	0.67	ug/l	7.35	---	##### - #####	
207 Pb	0.72	ug/l	6.57	---	##### - #####	
208 Pb	0.69	ug/l	0.64	---	##### - #####	
232 Th	4.96	ug/l	6.62	---	##### - #####	
238 U	-0.07	ug/l	15.94	---	##### - #####	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	658316.63	5.42	609356.69	108.0	60 - 125	
72 Ge	921893.38	4.82	849473.38	108.5	60 - 125	
89 Y	1377734.30	4.92	1346571.10	102.3	60 - 125	
115 In	1692580.00	4.30	1630928.10	103.8	60 - 125	
209 Bi	5068075.50	4.92	5261894.50	96.3	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failure: 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01064

QCS QC Report **ICPMS202-B**

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\018AB.D\018AB.D#
Date Acquired: Feb 14 2018 12:55 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: **ICSAB**
Misc Info: ICPMS-200.8-W-D
Vial Number: 4107
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: ICSAB
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range(%)	Flag
9 Be	-0.10	ug/l	22.82	---	##### - #####	
11 B	-0.47	ug/l	23.28	---	##### - #####	
27 Al	42250.00	ug/l	1.64	40000.00	70 - 130	
47 Ti	862.80	ug/l	1.54	800.00	70 - 130	
51 V	20.69	ug/l	1.51	20.00	70 - 130	
52 Cr	21.98	ug/l	0.93	20.00	70 - 130	
53 Cr	23.84	ug/l	3.68	20.00	70 - 130	
55 Mn	21.11	ug/l	1.32	20.00	70 - 130	
57 Fe	94500.00	ug/l	2.67	100000.00	70 - 130	
59 Co	21.00	ug/l	0.96	20.00	70 - 130	
60 Ni	21.84	ug/l	1.12	20.00	70 - 130	
62 Ni	23.51	ug/l	6.63	20.00	70 - 130	
63 Cu	22.12	ug/l	1.10	20.00	70 - 130	
65 Cu	20.40	ug/l	2.02	20.00	70 - 130	
66 Zn	11.15	ug/l	2.29	10.00	70 - 130	
75 As	10.10	ug/l	1.02	10.00	70 - 130	
77 Se	13.44	ug/l	2.73	10.00	70 - 130	
79 Br	6.30	ug/l	12.16	---	##### - #####	
82 Se	9.49	ug/l	3.71	10.00	70 - 130	
88 Sr	0.45	ug/l	5.51	---	##### - #####	
95 Mo	834.90	ug/l	4.69	800.00	70 - 130	
97 Mo	860.10	ug/l	3.61	800.00	70 - 130	
98 Mo	844.90	ug/l	3.49	800.00	70 - 130	
107 Ag	20.63	ug/l	2.20	20.00	70 - 130	
109 Ag	20.76	ug/l	1.94	20.00	70 - 130	
111 Cd	9.99	ug/l	2.05	10.00	70 - 130	
114 Cd	9.77	ug/l	4.92	10.00	70 - 130	
118 Sn	0.27	ug/l	17.10	---	##### - #####	
121 Sb	0.07	ug/l	16.46	---	##### - #####	
123 Sb	0.07	ug/l	13.42	---	##### - #####	
135 Ba	0.04	ug/l	170.59	---	##### - #####	
137 Ba	0.00	ug/l	3901.30	---	##### - #####	
139 La	0.03	ug/l	20.66	---	##### - #####	
140 Ce	0.05	ug/l	9.32	---	##### - #####	
199 Hg	0.02	ug/l	61.56	---	##### - #####	
200 Hg	0.03	ug/l	9.12	---	##### - #####	
202 Hg	0.01	ug/l	60.08	---	##### - #####	
203 Tl	0.35	ug/l	6.15	---	##### - #####	
205 Tl	0.34	ug/l	6.55	---	##### - #####	
206 Pb	0.74	ug/l	5.51	---	##### - #####	
207 Pb	0.73	ug/l	4.64	---	##### - #####	
208 Pb	0.74	ug/l	3.06	---	##### - #####	
232 Th	2.75	ug/l	6.26	---	##### - #####	
238 U	-0.09	ug/l	5.18	---	##### - #####	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	737430.00	3.71	609356.69	121.0	60 - 125	
72 Ge	1009699.10	2.62	849473.38	118.9	60 - 125	
89 Y	1540031.50	4.95	1346571.10	114.4	60 - 125	
115 In	1878215.80	5.07	1630928.10	115.2	60 - 125	
209 Bi	5594635.00	4.11	5261894.50	106.3	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01065

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\019SMPL.D\019SMPL.D#
Date Acquired: Feb 14 2018 12:57 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: ULR3
Misc Info: ICPMS-6020-W-D
Vial Number: 4103
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.001	-0.001	ug/l	2920.60	4500.00	232.22		P
11 B	-2.811	-2.811	ug/l	5.54	4500.00	1083.33		P
27 Al	41.660	41.660	ug/l	10.67	4500.00	114123.30		P
47 Ti	5,311.000	5311.000	ug/l	1.30	4500.00	1940212.00	> Cal	A
51 V	0.047	0.047	ug/l	35.85	4500.00	1314.50		P
52 Cr	0.121	0.121	ug/l	48.14	4500.00	3990.00		P
53 Cr	0.114	0.114	ug/l	73.83	4500.00	320.00		P
55 Mn	-0.011	-0.011	ug/l	71.93	4500.00	1423.33		P
57 Fe	108.500	108.500	ug/l	14.10	4500.00	21643.33		P
59 Co	0.159	0.159	ug/l	39.51	4500.00	2020.00		P
60 Ni	0.625	0.625	ug/l	14.99	4500.00	1033.33		P
62 Ni	5.756	5.756	ug/l	15.20	4500.00	1266.67		P
63 Cu	0.500	0.500	ug/l	19.03	4500.00	2260.00		P
65 Cu	1.286	1.286	ug/l	11.40	4500.00	2186.67		P
66 Zn	0.922	0.922	ug/l	20.76	4500.00	1353.09		P
75 As	0.082	0.082	ug/l	36.01	4500.00	388.10		P
77 Se	0.104	0.104	ug/l	54.41	4500.00	75.33		P
79 Br	0.109	0.109	ug/l	---	#VALUE!	266.67		P
82 Se	-0.021	-0.021	ug/l	722.20	4500.00	27.47		P
88 Sr	0.041	0.041	ug/l	44.40	4500.00	1336.67		P
95 Mo	5,143.000	5143.000	ug/l	1.59	4500.00	9494390.00	> Cal	A
97 Mo	5,220.000	5220.000	ug/l	2.00	4500.00	6053815.00	> Cal	A
98 Mo	5,164.000	5164.000	ug/l	2.22	4500.00	15688020.00	> Cal	A
107 Ag	0.016	0.016	ug/l	60.96	1800.00	691.11		P
109 Ag	0.015	0.015	ug/l	95.44	1800.00	691.11		P
111 Cd	0.206	0.206	ug/l	51.63	4500.00	1175.53		P
114 Cd	-8.767	-8.767	ug/l	9.99	4500.00	-28449.69		P
118 Sn	5,404.000	5404.000	ug/l	1.67	4500.00	19222660.00	> Cal	A
121 Sb	5,038.000	5038.000	ug/l	1.49	4500.00	26641400.00	> Cal	A
123 Sb	5,025.000	5025.000	ug/l	2.85	4500.00	20780160.00	> Cal	A
135 Ba	0.333	0.333	ug/l	6.51	4500.00	576.67		P
137 Ba	1.533	1.533	ug/l	10.01	4500.00	3736.67		P
139 La	0.116	0.116	ug/l	3.49	4500.00	2530.00		P
140 Ce	0.027	0.027	ug/l	2.16	4500.00	623.33		P
199 Hg	-0.001	-0.001	ug/l	1769.00	450.00	99.00		P
200 Hg	0.014	0.014	ug/l	14.48	450.00	136.00		P
202 Hg	-0.002	-0.002	ug/l	366.23	450.00	140.00		P
203 Tl	1.566	1.566	ug/l	3.78	4500.00	13476.67		P
205 Tl	1.575	1.575	ug/l	4.52	4500.00	32456.67		P
206 Pb	0.153	0.153	ug/l	42.39	4500.00	1910.00		P
207 Pb	0.169	0.169	ug/l	44.87	4500.00	1840.00		P
208 Pb	0.169	0.169	ug/l	31.02	4500.00	7876.67		P
232 Th	8.307	8.307	ug/l	5.88	4500.00	265921.09		P
238 U	0.008	0.008	ug/l	70.18	4500.00	5380.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	831076.63	0.39	609356.69	136.4	60.000002	- 125	ISFail
72 Ge	1083501.30	2.98	849473.38	127.5	60.000002	- 125	ISFail
89 Y	1747695.10	2.10	1346571.10	129.8	60.000002	- 125	
115 In	2076033.00	1.74	1630928.10	127.3	60.000002	- 125	ISFail
209 Bi	6514149.50	2.68	5261894.50	123.8	60.000002	- 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

7 :Element Failures 0 :Max. Number of Failures Allowed
3 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Fail
ISTD: Fail

ED_004985_00011411-01066

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\020SMPL.D\020SMPL.D#
Date Acquired: Feb 14 2018 01:00 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: ULR2
Misc Info: ICPMS-6020-W-D
Vial Number: 4104
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	5,206.000	5206.000	ug/l	2.16	4500.00	5007770.00	> Cal	A
11 B	6,342.000	6342.000	ug/l	0.13	4500.00	3693316.00		A
27 Al	5,798.000	5798.000	ug/l	1.31	4500.00	13496950.00		A
47 Ti	6.015	6.015	ug/l	10.23	4500.00	2100.00		P
51 V	5,224.000	5224.000	ug/l	2.78	4500.00	24466690.00	> Cal	A
52 Cr	5,249.000	5249.000	ug/l	2.87	4500.00	21427740.00	> Cal	A
53 Cr	5,368.000	5368.000	ug/l	0.93	4500.00	2554627.00	> Cal	A
55 Mn	5,362.000	5362.000	ug/l	2.51	4500.00	28864900.00		A
57 Fe	5,205.000	5205.000	ug/l	2.97	4500.00	627930.00		P
59 Co	5,318.000	5318.000	ug/l	3.62	4500.00	26071450.00	> Cal	A
60 Ni	5,277.000	5277.000	ug/l	3.65	4500.00	5818228.00	> Cal	A
62 Ni	5,528.000	5528.000	ug/l	1.65	4500.00	911970.00		P
63 Cu	5,224.000	5224.000	ug/l	2.44	4500.00	14159720.00		A
65 Cu	5,408.000	5408.000	ug/l	2.64	4500.00	7062501.00		A
66 Zn	5,222.000	5222.000	ug/l	2.80	4500.00	4590872.00		A
75 As	5,101.000	5101.000	ug/l	1.04	4500.00	4956117.00	> Cal	A
77 Se	5,414.000	5414.000	ug/l	1.64	4500.00	339914.31	> Cal	P
79 Br	15.320	15.320	ug/l	---	#VALUE!	2386.67		P
82 Se	5,417.000	5417.000	ug/l	1.95	4500.00	452508.00	> Cal	P
88 Sr	5,215.000	5215.000	ug/l	0.25	4500.00	43301968.00		A
95 Mo	12.770	12.770	ug/l	5.97	4500.00	22550.00		P
97 Mo	12.610	12.610	ug/l	9.67	4500.00	14016.67		P
98 Mo	12.750	12.750	ug/l	9.40	4500.00	37125.27		P
107 Ag	2,087.000	2087.000	ug/l	3.31	1800.00	10944240.00	> Cal	A
109 Ag	2,119.000	2119.000	ug/l	3.26	1800.00	10690840.00	> Cal	A
111 Cd	4,980.000	4980.000	ug/l	2.26	4500.00	6634329.00	> Cal	A
114 Cd	4,958.000	4958.000	ug/l	2.44	4500.00	15317970.00	> Cal	A
118 Sn	17.470	17.470	ug/l	9.32	4500.00	59233.33		P
121 Sb	19.440	19.440	ug/l	13.24	4500.00	97562.34		P
123 Sb	19.420	19.420	ug/l	13.30	4500.00	76226.34		P
135 Ba	4,797.000	4797.000	ug/l	3.54	4500.00	5791816.00		A
137 Ba	4,806.000	4806.000	ug/l	3.13	4500.00	10239520.00		A
139 La	0.073	0.073	ug/l	15.01	4500.00	1500.00		P
140 Ce	0.031	0.031	ug/l	4.34	4500.00	666.67		P
199 Hg	0.015	0.015	ug/l	88.24	450.00	113.33		P
200 Hg	0.019	0.019	ug/l	36.16	450.00	137.00		P
202 Hg	0.026	0.026	ug/l	9.60	450.00	197.00		P
203 Tl	4,917.000	4917.000	ug/l	2.19	4500.00	36578920.00	> Cal	A
205 Tl	5,032.000	5032.000	ug/l	1.29	4500.00	89660680.00	> Cal	A
206 Pb	5,068.000	5068.000	ug/l	1.22	4500.00	30032240.00		A
207 Pb	4,992.000	4992.000	ug/l	0.63	4500.00	27281060.00		A
208 Pb	5,021.000	5021.000	ug/l	1.11	4500.00	##########	> Cal	A
232 Th	5,136.000	5136.000	ug/l	2.37	4500.00	##########	> Cal	A
238 U	4,887.000	4887.000	ug/l	1.26	4500.00	##########	> Cal	A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	729950.00	0.96	609356.69	119.8	60.000002 -	125
72 Ge	974264.38	1.01	849473.38	114.7	60.000002 -	125
89 Y	1640748.30	0.32	1346571.10	121.8	60.000002 -	125
115 In	1955013.00	1.89	1630928.10	119.9	60.000002 -	125
209 Bi	6052052.00	0.97	5261894.50	115.0	60.000002 -	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

18 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Fail
ISTD: Pass

ED_004985_00011411-01067

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\021_CCB.D\021_CCB.D#
Date Acquired: Feb 14 2018 01:02 pm
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:30 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	3.078	ug/l	19.31	0.09	Fail
11 B	34.520	ug/l	20.55	1.18	Fail
27 Al	22.250	ug/l	12.00	0.38	Fail
47 Ti	2.933	ug/l	12.21	0.17	Fail
51 V	3.038	ug/l	18.03	0.09	Fail
52 Cr	3.115	ug/l	15.04	0.12	Fail
53 Cr	3.589	ug/l	17.70	0.13	Fail
55 Mn	3.304	ug/l	14.35	0.14	Fail
57 Fe	53.460	ug/l	12.06	4.00	Fail
59 Co	3.275	ug/l	20.64	0.04	Fail
60 Ni	3.119	ug/l	14.72	0.08	Fail
62 Ni	3.357	ug/l	18.63	0.32	Fail
63 Cu	3.160	ug/l	11.45	0.09	Fail
65 Cu	3.256	ug/l	10.50	0.22	Fail
66 Zn	3.222	ug/l	24.53	0.10	Fail
75 As	4.198	ug/l	14.48	0.12	Fail
77 Se	5.285	ug/l	9.45	1.22	Fail
79 Br	0.427	ug/l	65.81	#VALUE!	
82 Se	5.115	ug/l	14.38	0.32	Fail
88 Sr	3.144	ug/l	15.74	0.05	Fail
95 Mo	3.959	ug/l	5.73	0.05	Fail
97 Mo	3.913	ug/l	5.06	0.03	Fail
98 Mo	3.911	ug/l	5.28	0.03	Fail
107 Ag	1.688	ug/l	13.60	0.09	Fail
109 Ag	1.733	ug/l	17.84	0.10	Fail
111 Cd	3.103	ug/l	19.50	0.03	Fail
114 Cd	3.082	ug/l	13.71	0.03	Fail
118 Sn	2.906	ug/l	12.93	0.05	Fail
121 Sb	2.835	ug/l	9.75	0.03	Fail
123 Sb	2.846	ug/l	11.17	0.04	Fail
135 Ba	3.147	ug/l	15.73	0.09	Fail
137 Ba	2.926	ug/l	16.02	0.08	Fail
139 La	0.005	ug/l	21.09	0.02	
140 Ce	0.002	ug/l	31.27	0.02	
199 Hg	0.003	ug/l	117.28	0.03	
200 Hg	0.005	ug/l	145.62	0.03	
202 Hg	-0.001	ug/l	726.12	0.03	
203 Tl	4.438	ug/l	7.98	0.03	Fail
205 Tl	4.382	ug/l	8.80	0.02	Fail
206 Pb	4.017	ug/l	13.50	#VALUE!	
207 Pb	4.116	ug/l	13.69	#VALUE!	
208 Pb	4.060	ug/l	14.96	0.02	Fail
232 Th	10.500	ug/l	5.76	0.06	Fail
238 U	3.106	ug/l	14.54	0.02	Fail

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	646513.31	1.52	609356.69	106.1	60 - 125	
72 Ge	885826.63	1.07	849473.38	104.3	60 - 125	
89 Y	1410064.90	0.37	1346571.10	104.7	60 - 125	
115 In	1732815.00	1.94	1630928.10	106.2	60 - 125	
209 Bi	5426562.00	0.83	5261894.50	103.1	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

36 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Fail
ISTD: Pass

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\022SMPL.D\022SMPL.D#
Date Acquired: Feb 14 2018 01:05 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	1.664	1.664	ug/l	20.84	4500.00	1575.56		P
11 B	7.097	7.097	ug/l	3.81	4500.00	5877.78		P
27 Al	14.260	14.260	ug/l	10.69	4500.00	31883.33		P
47 Ti	1.541	1.541	ug/l	26.72	4500.00	570.00		P
51 V	1.661	1.661	ug/l	18.22	4500.00	7926.79		P
52 Cr	1.650	1.650	ug/l	15.27	4500.00	8920.00		P
53 Cr	1.791	1.791	ug/l	14.46	4500.00	986.67		P
55 Mn	1.681	1.681	ug/l	21.74	4500.00	9420.00		P
57 Fe	31.590	31.590	ug/l	14.90	4500.00	9366.67		P
59 Co	1.759	1.759	ug/l	16.87	4500.00	8770.00		P
60 Ni	1.610	1.610	ug/l	15.06	4500.00	1830.00		P
62 Ni	2.027	2.027	ug/l	30.16	4500.00	476.67		P
63 Cu	1.706	1.706	ug/l	15.62	4500.00	4816.67		P
65 Cu	1.609	1.609	ug/l	18.48	4500.00	2170.00		P
66 Zn	1.659	1.659	ug/l	6.67	4500.00	1696.03		P
75 As	1.983	1.983	ug/l	16.20	4500.00	1992.54		P
77 Se	2.151	2.151	ug/l	10.83	4500.00	178.33		P
79 Br	0.091	0.091	ug/l	---	#VALUE!	216.67		P
82 Se	1.961	1.961	ug/l	27.14	4500.00	172.60		P
88 Sr	1.664	1.664	ug/l	17.32	4500.00	13306.67		P
95 Mo	2.093	2.093	ug/l	7.05	4500.00	3523.33		P
97 Mo	2.091	2.091	ug/l	4.90	4500.00	2240.00		P
98 Mo	2.102	2.102	ug/l	4.26	4500.00	5892.70		P
107 Ag	0.907	0.907	ug/l	12.38	1800.00	4696.67		P
109 Ag	0.895	0.895	ug/l	7.73	1800.00	4490.00		P
111 Cd	1.634	1.634	ug/l	21.27	4500.00	2649.96		P
114 Cd	1.643	1.643	ug/l	15.14	4500.00	4710.17		P
118 Sn	1.529	1.529	ug/l	4.02	4500.00	5140.00		P
121 Sb	1.677	1.677	ug/l	5.27	4500.00	8045.33		P
123 Sb	1.640	1.640	ug/l	4.53	4500.00	6173.33		P
135 Ba	1.462	1.462	ug/l	14.82	4500.00	1680.00		P
137 Ba	1.697	1.697	ug/l	12.69	4500.00	3413.33		P
139 La	0.004	0.004	ug/l	62.61	4500.00	103.33		P
140 Ce	0.002	0.002	ug/l	151.81	4500.00	83.33		P
199 Hg	-0.004	-0.004	ug/l	47.50	450.00	79.67		P
200 Hg	-0.003	-0.003	ug/l	333.14	450.00	86.67		P
202 Hg	-0.008	-0.008	ug/l	44.39	450.00	104.67		P
203 Tl	3.316	3.316	ug/l	5.96	4500.00	23220.00		P
205 Tl	3.384	3.384	ug/l	4.03	4500.00	56733.33		P
206 Pb	2.112	2.112	ug/l	11.17	4500.00	12166.67		P
207 Pb	2.147	2.147	ug/l	10.14	4500.00	11383.33		P
208 Pb	2.121	2.121	ug/l	11.86	4500.00	50276.66		P
232 Th	3.756	3.756	ug/l	2.29	4500.00	104678.90		P
238 U	1.577	1.577	ug/l	14.95	4500.00	50136.66		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	638520.00	2.03	609356.69	104.8	60.000002	-	125
72 Ge	885230.00	1.63	849473.38	104.2	60.000002	-	125
89 Y	1416983.60	1.59	1346571.10	105.2	60.000002	-	125
115 In	1725693.00	2.09	1630928.10	105.8	60.000002	-	125
209 Bi	5503272.50	1.21	5261894.50	104.6	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01069

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\023SMPL.D\023SMPL.D#
Date Acquired: Feb 14 2018 01:08 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	1.102	1.102	ug/l	8.37	4500.00	1090.00		P
11 B	3.199	3.199	ug/l	3.23	4500.00	3833.33		P
27 Al	8.881	8.881	ug/l	9.69	4500.00	20636.67		P
47 Ti	0.865	0.865	ug/l	36.80	4500.00	363.33		P
51 V	1.068	1.068	ug/l	14.79	4500.00	5315.67		P
52 Cr	1.163	1.163	ug/l	5.81	4500.00	6993.33		P
53 Cr	1.048	1.048	ug/l	30.15	4500.00	653.33		P
55 Mn	1.105	1.105	ug/l	3.53	4500.00	6500.00		P
57 Fe	26.480	26.480	ug/l	20.83	4500.00	8653.33		P
59 Co	1.125	1.125	ug/l	6.34	4500.00	5846.67		P
60 Ni	1.068	1.068	ug/l	7.40	4500.00	1266.67		P
62 Ni	0.921	0.921	ug/l	66.42	4500.00	306.67		P
63 Cu	1.070	1.070	ug/l	4.15	4500.00	3196.67		P
65 Cu	1.050	1.050	ug/l	8.41	4500.00	1483.33		P
66 Zn	0.896	0.896	ug/l	20.27	4500.00	1066.19		P
75 As	1.200	1.200	ug/l	2.95	4500.00	1280.59		P
77 Se	1.480	1.480	ug/l	16.80	4500.00	137.33		P
79 Br	-0.194	-0.194	ug/l	---	#VALUE!	176.67		P
82 Se	1.415	1.415	ug/l	19.61	4500.00	129.47		P
88 Sr	1.054	1.054	ug/l	6.07	4500.00	8566.67		P
95 Mo	1.425	1.425	ug/l	7.94	4500.00	2460.00		P
97 Mo	1.384	1.384	ug/l	6.80	4500.00	1533.33		P
98 Mo	1.432	1.432	ug/l	2.22	4500.00	4133.26		P
107 Ag	0.563	0.563	ug/l	9.60	1800.00	3054.44		P
109 Ag	0.538	0.538	ug/l	8.58	1800.00	2853.33		P
111 Cd	1.049	1.049	ug/l	6.88	4500.00	1935.21		P
114 Cd	1.013	1.013	ug/l	9.75	4500.00	2946.36		P
118 Sn	1.037	1.037	ug/l	6.64	4500.00	3626.67		P
121 Sb	1.164	1.164	ug/l	4.06	4500.00	5701.33		P
123 Sb	1.181	1.181	ug/l	4.06	4500.00	4523.00		P
135 Ba	1.024	1.024	ug/l	2.50	4500.00	1196.67		P
137 Ba	0.962	0.962	ug/l	3.03	4500.00	2003.33		P
139 La	0.003	0.003	ug/l	76.75	4500.00	80.00		P
140 Ce	0.000	0.000	ug/l	2580.20	4500.00	50.00		P
199 Hg	-0.001	-0.001	ug/l	705.64	450.00	82.33		P
200 Hg	0.005	0.005	ug/l	205.47	450.00	99.00		P
202 Hg	-0.001	-0.001	ug/l	386.70	450.00	118.67		P
203 Tl	2.912	2.912	ug/l	3.68	4500.00	20430.00		P
205 Tl	2.951	2.951	ug/l	1.11	4500.00	49573.33		P
206 Pb	1.416	1.416	ug/l	5.16	4500.00	8396.67		P
207 Pb	1.388	1.388	ug/l	0.85	4500.00	7596.67		P
208 Pb	1.390	1.390	ug/l	2.90	4500.00	33843.33		P
232 Th	2.144	2.144	ug/l	3.14	4500.00	61953.33		P
238 U	0.987	0.987	ug/l	4.81	4500.00	32910.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	628783.31	1.51	609356.69	103.2	60.000002	-	125
72 Ge	869246.63	1.39	849473.38	102.3	60.000002	-	125
89 Y	1392584.00	1.11	1346571.10	103.4	60.000002	-	125
115 In	1698255.30	1.96	1630928.10	104.1	60.000002	-	125
209 Bi	5485071.00	0.95	5261894.50	104.2	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01070

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\024CCV.D\024CCV.D#
Date Acquired: Feb 14 2018 01:10 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	50.310	ug/l	3.38	50.00	85 - 115	90 - 110	
11 B	51.510	ug/l	3.97	50.00	85 - 115	90 - 110	
27 Al	57.170	ug/l	3.88	50.00	85 - 115	90 - 110	>10%
47 Ti	51.610	ug/l	2.74	50.00	85 - 115	90 - 110	
51 V	50.280	ug/l	4.67	50.00	85 - 115	90 - 110	
52 Cr	50.250	ug/l	3.08	50.00	85 - 115	90 - 110	
53 Cr	51.710	ug/l	4.42	50.00	85 - 115	90 - 110	
55 Mn	51.010	ug/l	3.69	50.00	85 - 115	90 - 110	
57 Fe	1317.000	ug/l	4.02	1300.00	85 - 115	90 - 110	
59 Co	51.240	ug/l	3.35	50.00	85 - 115	90 - 110	
60 Ni	50.950	ug/l	4.37	50.00	85 - 115	90 - 110	
62 Ni	51.260	ug/l	3.41	50.00	85 - 115	90 - 110	
63 Cu	51.570	ug/l	4.75	50.00	85 - 115	90 - 110	
65 Cu	51.220	ug/l	6.03	50.00	85 - 115	90 - 110	
66 Zn	51.870	ug/l	4.55	50.00	85 - 115	90 - 110	
75 As	50.530	ug/l	3.86	50.00	85 - 115	90 - 110	
77 Se	51.800	ug/l	3.04	50.00	85 - 115	90 - 110	
79 Br	1.222	ug/l	51.25	---	#### - ####	#### - ####	
82 Se	51.800	ug/l	3.81	50.00	85 - 115	90 - 110	
88 Sr	50.180	ug/l	5.56	50.00	85 - 115	90 - 110	
95 Mo	50.530	ug/l	7.75	50.00	85 - 115	90 - 110	
97 Mo	50.980	ug/l	7.07	50.00	85 - 115	90 - 110	
98 Mo	50.440	ug/l	6.03	50.00	85 - 115	90 - 110	
107 Ag	19.950	ug/l	4.13	20.00	85 - 115	90 - 110	
109 Ag	20.360	ug/l	3.44	20.00	85 - 115	90 - 110	
111 Cd	50.750	ug/l	6.65	50.00	85 - 115	90 - 110	
114 Cd	50.640	ug/l	6.16	50.00	85 - 115	90 - 110	
118 Sn	50.500	ug/l	6.00	50.00	85 - 115	90 - 110	
121 Sb	50.090	ug/l	6.21	50.00	85 - 115	90 - 110	
123 Sb	49.650	ug/l	6.96	50.00	85 - 115	90 - 110	
135 Ba	48.570	ug/l	5.11	50.00	85 - 115	90 - 110	
137 Ba	49.260	ug/l	6.49	50.00	85 - 115	90 - 110	
139 La	49.380	ug/l	6.09	50.00	85 - 115	90 - 110	
140 Ce	49.720	ug/l	6.34	50.00	85 - 115	90 - 110	
199 Hg	1.002	ug/l	1.80	1.00	85 - 115	90 - 110	
200 Hg	1.057	ug/l	5.44	1.00	85 - 115	90 - 110	
202 Hg	1.082	ug/l	5.86	1.00	85 - 115	90 - 110	
203 Tl	52.150	ug/l	3.60	50.00	85 - 115	90 - 110	
205 Tl	53.220	ug/l	3.12	50.00	85 - 115	90 - 110	
206 Pb	51.560	ug/l	2.48	50.00	85 - 115	90 - 110	
207 Pb	50.830	ug/l	3.18	50.00	85 - 115	90 - 110	
208 Pb	50.840	ug/l	2.99	50.00	85 - 115	90 - 110	
232 Th	55.000	ug/l	3.13	50.00	85 - 115	90 - 110	
238 U	49.770	ug/l	3.99	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	625793.31	1.07	609356.69	102.7	60 - 125	
72 Ge	849576.63	1.83	849473.38	100.0	60 - 125	
89 Y	1363563.40	1.71	1346571.10	101.3	60 - 125	
115 In	1625484.50	4.19	1630928.10	99.7	60 - 125	
209 Bi	5114270.50	1.44	5261894.50	97.2	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

QC Range 1
0 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
1 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01071

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\025SMPL.D\025SMPL.D#
Date Acquired: Feb 14 2018 01:13 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.552	0.552	ug/l	10.31	4500.00	642.22		P
11 B	-0.179	-0.179	ug/l	66.22	4500.00	2171.11		P
27 Al	3.191	3.191	ug/l	10.51	4500.00	9370.00		P
47 Ti	0.609	0.609	ug/l	71.44	4500.00	286.67		P
51 V	0.580	0.580	ug/l	25.87	4500.00	3280.45		P
52 Cr	0.629	0.629	ug/l	28.65	4500.00	5056.67		P
53 Cr	0.456	0.456	ug/l	13.89	4500.00	403.33		P
55 Mn	0.621	0.621	ug/l	6.69	4500.00	4193.33		P
57 Fe	15.120	15.120	ug/l	5.70	4500.00	7476.67		P
59 Co	0.615	0.615	ug/l	7.87	4500.00	3633.33		P
60 Ni	0.539	0.539	ug/l	27.78	4500.00	746.67		P
62 Ni	0.053	0.053	ug/l	716.51	4500.00	180.00		P
63 Cu	0.553	0.553	ug/l	18.31	4500.00	1950.00		P
65 Cu	0.625	0.625	ug/l	26.54	4500.00	990.00		P
66 Zn	0.313	0.313	ug/l	23.31	4500.00	613.05		P
75 As	0.661	0.661	ug/l	14.07	4500.00	815.07		P
77 Se	0.822	0.822	ug/l	28.67	4500.00	101.00		P
79 Br	-0.093	-0.093	ug/l	---	#VALUE!	190.00		P
82 Se	0.860	0.860	ug/l	12.52	4500.00	88.13		P
88 Sr	0.562	0.562	ug/l	16.91	4500.00	4933.33		P
95 Mo	0.950	0.950	ug/l	8.54	4500.00	1736.67		P
97 Mo	1.033	1.033	ug/l	16.51	4500.00	1193.33		P
98 Mo	0.946	0.946	ug/l	10.74	4500.00	2923.19		P
107 Ag	0.470	0.470	ug/l	7.06	1800.00	2626.67		P
109 Ag	0.454	0.454	ug/l	9.08	1800.00	2478.89		P
111 Cd	0.580	0.580	ug/l	18.91	4500.00	1387.18		P
114 Cd	0.517	0.517	ug/l	6.07	4500.00	1612.77		P
118 Sn	1.111	1.111	ug/l	5.06	4500.00	3833.33		P
121 Sb	0.764	0.764	ug/l	2.01	4500.00	3960.00		P
123 Sb	0.756	0.756	ug/l	2.44	4500.00	3075.67		P
135 Ba	0.582	0.582	ug/l	2.53	4500.00	730.00		P
137 Ba	0.480	0.480	ug/l	16.51	4500.00	1106.67		P
139 La	0.038	0.038	ug/l	8.21	4500.00	690.00		P
140 Ce	0.041	0.041	ug/l	33.30	4500.00	743.33		P
199 Hg	0.007	0.007	ug/l	76.86	450.00	91.00		P
200 Hg	0.013	0.013	ug/l	105.77	450.00	111.00		P
202 Hg	0.007	0.007	ug/l	17.96	450.00	133.00		P
203 Tl	2.811	2.811	ug/l	1.30	4500.00	19293.33		P
205 Tl	2.791	2.791	ug/l	3.72	4500.00	45863.33		P
206 Pb	0.829	0.829	ug/l	7.45	4500.00	5116.67		P
207 Pb	0.815	0.815	ug/l	8.56	4500.00	4640.00		P
208 Pb	0.827	0.827	ug/l	6.83	4500.00	20776.67		P
232 Th	1.249	1.249	ug/l	5.42	4500.00	37504.44		P
238 U	0.551	0.551	ug/l	11.47	4500.00	19750.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	637860.00	2.54	609356.69	104.7	60.000002	-	125
72 Ge	872696.63	2.84	849473.38	102.7	60.000002	-	125
89 Y	1405309.90	1.52	1346571.10	104.4	60.000002	-	125
115 In	1693641.50	2.85	1630928.10	103.8	60.000002	-	125
209 Bi	5357682.50	3.45	5261894.50	101.8	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01072

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\026_CCB.D\026_CCB.D#
Date Acquired: Feb 14 2018 01:15 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:30 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	0.303	ug/l	16.09	0.09	Fail
11 B	-0.178	ug/l	116.54	1.18	
27 Al	1.560	ug/l	15.85	0.38	Fail
47 Ti	0.207	ug/l	42.01	0.17	Fail
51 V	0.353	ug/l	3.76	0.09	Fail
52 Cr	0.437	ug/l	6.55	0.12	Fail
53 Cr	0.468	ug/l	48.72	0.13	Fail
55 Mn	0.387	ug/l	17.05	0.14	Fail
57 Fe	8.281	ug/l	36.80	4.00	Fail
59 Co	0.345	ug/l	16.95	0.04	Fail
60 Ni	0.292	ug/l	37.94	0.08	Fail
62 Ni	0.131	ug/l	63.72	0.32	
63 Cu	0.350	ug/l	5.28	0.09	Fail
65 Cu	0.324	ug/l	20.15	0.22	Fail
66 Zn	0.259	ug/l	53.63	0.10	Fail
75 As	0.381	ug/l	10.09	0.12	Fail
77 Se	0.585	ug/l	28.94	1.22	
79 Br	-0.011	ug/l	1727.90	#VALUE!	
82 Se	0.481	ug/l	58.02	0.32	Fail
88 Sr	0.334	ug/l	13.10	0.05	Fail
95 Mo	0.591	ug/l	8.67	0.05	Fail
97 Mo	0.472	ug/l	30.56	0.03	Fail
98 Mo	0.486	ug/l	9.10	0.03	Fail
107 Ag	0.237	ug/l	10.87	0.09	Fail
109 Ag	0.248	ug/l	6.03	0.10	Fail
111 Cd	0.354	ug/l	15.66	0.03	Fail
114 Cd	0.360	ug/l	13.27	0.03	Fail
118 Sn	0.548	ug/l	9.07	0.05	Fail
121 Sb	0.445	ug/l	1.30	0.03	Fail
123 Sb	0.447	ug/l	3.41	0.04	Fail
135 Ba	0.348	ug/l	15.96	0.09	Fail
137 Ba	0.291	ug/l	17.50	0.08	Fail
139 La	0.022	ug/l	21.52	0.02	Fail
140 Ce	0.015	ug/l	36.95	0.02	
199 Hg	0.003	ug/l	262.12	0.03	
200 Hg	0.001	ug/l	53.18	0.03	
202 Hg	-0.007	ug/l	45.11	0.03	
203 Tl	2.357	ug/l	3.51	0.03	Fail
205 Tl	2.395	ug/l	0.40	0.02	Fail
206 Pb	0.554	ug/l	6.53	#VALUE!	
207 Pb	0.539	ug/l	9.24	#VALUE!	
208 Pb	0.553	ug/l	6.76	0.02	Fail
232 Th	0.735	ug/l	3.24	0.06	Fail
238 U	0.313	ug/l	17.39	0.02	Fail

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	636416.69	1.80	609356.69	104.4	60 - 125	
72 Ge	870290.00	1.74	849473.38	102.5	60 - 125	
89 Y	1395839.40	0.49	1346571.10	103.7	60 - 125	
115 In	1688432.50	1.02	1630928.10	103.5	60 - 125	
209 Bi	5350719.50	3.18	5261894.50	101.7	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

34 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Fail
ISTD: Pass

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\037CCV.D\037CCV.D#
Date Acquired: Feb 14 2018 01:44 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	50.520	ug/l	5.81	50.00	85 - 115	90 - 110	
11 B	48.720	ug/l	3.37	50.00	85 - 115	90 - 110	
27 Al	50.410	ug/l	4.07	50.00	85 - 115	90 - 110	
47 Ti	51.250	ug/l	5.27	50.00	85 - 115	90 - 110	
51 V	49.540	ug/l	4.58	50.00	85 - 115	90 - 110	
52 Cr	49.630	ug/l	5.32	50.00	85 - 115	90 - 110	
53 Cr	49.660	ug/l	6.25	50.00	85 - 115	90 - 110	
55 Mn	49.880	ug/l	4.91	50.00	85 - 115	90 - 110	
57 Fe	1294.000	ug/l	4.79	1300.00	85 - 115	90 - 110	
59 Co	49.970	ug/l	5.03	50.00	85 - 115	90 - 110	
60 Ni	49.600	ug/l	5.40	50.00	85 - 115	90 - 110	
62 Ni	50.120	ug/l	5.27	50.00	85 - 115	90 - 110	
63 Cu	49.310	ug/l	4.74	50.00	85 - 115	90 - 110	
65 Cu	49.330	ug/l	4.03	50.00	85 - 115	90 - 110	
66 Zn	50.810	ug/l	5.66	50.00	85 - 115	90 - 110	
75 As	48.430	ug/l	4.91	50.00	85 - 115	90 - 110	
77 Se	49.290	ug/l	5.93	50.00	85 - 115	90 - 110	
79 Br	2.948	ug/l	27.70	---	#### - ####	#### - ####	
82 Se	49.300	ug/l	3.30	50.00	85 - 115	90 - 110	
88 Sr	48.620	ug/l	5.14	50.00	85 - 115	90 - 110	
95 Mo	49.210	ug/l	5.91	50.00	85 - 115	90 - 110	
97 Mo	49.780	ug/l	3.71	50.00	85 - 115	90 - 110	
98 Mo	48.900	ug/l	5.18	50.00	85 - 115	90 - 110	
107 Ag	18.670	ug/l	2.21	20.00	85 - 115	90 - 110	
109 Ag	19.020	ug/l	1.99	20.00	85 - 115	90 - 110	
111 Cd	49.510	ug/l	4.73	50.00	85 - 115	90 - 110	
114 Cd	48.570	ug/l	4.71	50.00	85 - 115	90 - 110	
118 Sn	48.410	ug/l	5.42	50.00	85 - 115	90 - 110	
121 Sb	47.970	ug/l	4.64	50.00	85 - 115	90 - 110	
123 Sb	48.030	ug/l	4.30	50.00	85 - 115	90 - 110	
135 Ba	48.170	ug/l	4.22	50.00	85 - 115	90 - 110	
137 Ba	47.650	ug/l	5.26	50.00	85 - 115	90 - 110	
139 La	48.070	ug/l	4.07	50.00	85 - 115	90 - 110	
140 Ce	48.180	ug/l	4.19	50.00	85 - 115	90 - 110	
199 Hg	1.003	ug/l	8.45	1.00	85 - 115	90 - 110	
200 Hg	1.011	ug/l	6.21	1.00	85 - 115	90 - 110	
202 Hg	1.019	ug/l	5.93	1.00	85 - 115	90 - 110	
203 Tl	49.850	ug/l	3.71	50.00	85 - 115	90 - 110	
205 Tl	50.780	ug/l	3.50	50.00	85 - 115	90 - 110	
206 Pb	49.630	ug/l	4.95	50.00	85 - 115	90 - 110	
207 Pb	49.370	ug/l	4.05	50.00	85 - 115	90 - 110	
208 Pb	49.260	ug/l	4.37	50.00	85 - 115	90 - 110	
232 Th	44.280	ug/l	2.45	50.00	85 - 115	90 - 110	>10%
238 U	49.110	ug/l	4.79	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	724990.00	1.75	609356.69	119.0	60 - 125	
72 Ge	974493.38	2.24	849473.38	114.7	60 - 125	
89 Y	1540032.50	1.59	1346571.10	114.4	60 - 125	
115 In	1823936.40	2.40	1630928.10	111.8	60 - 125	
209 Bi	5608442.00	2.88	5261894.50	106.6	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

QC Range 1
0 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
1 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01074

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\038SMPL.D\038SMPL.D#
Date Acquired: Feb 14 2018 01:47 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.056	-0.056	ug/l	26.75	4500.00	148.89		P
11 B	-2.544	-2.544	ug/l	5.82	4500.00	1086.67		P
27 Al	-1.098	-1.098	ug/l	2.03	4500.00	740.00		P
47 Ti	-0.001	-0.001	ug/l	31438.00	4500.00	120.00		P
51 V	-0.029	-0.029	ug/l	27.25	4500.00	813.74		P
52 Cr	0.051	0.051	ug/l	17.73	4500.00	3260.00		P
53 Cr	-0.094	-0.094	ug/l	38.03	4500.00	186.67		P
55 Mn	-0.127	-0.127	ug/l	5.13	4500.00	650.00		P
57 Fe	6.305	6.305	ug/l	32.90	4500.00	7206.67		P
59 Co	-0.028	-0.028	ug/l	54.83	4500.00	896.67		P
60 Ni	-0.161	-0.161	ug/l	17.73	4500.00	63.33		P
62 Ni	0.109	0.109	ug/l	335.79	4500.00	206.67		P
63 Cu	-0.129	-0.129	ug/l	30.09	4500.00	326.67		P
65 Cu	-0.093	-0.093	ug/l	30.69	4500.00	166.67		P
66 Zn	-0.297	-0.297	ug/l	18.67	4500.00	146.48		P
75 As	-0.018	-0.018	ug/l	204.72	4500.00	248.74		P
77 Se	-0.055	-0.055	ug/l	129.38	4500.00	57.00		P
79 Br	0.845	0.845	ug/l	---	#VALUE!	340.00		P
82 Se	0.128	0.128	ug/l	37.28	4500.00	36.87		P
88 Sr	0.131	0.131	ug/l	4.00	4500.00	1920.00		P
95 Mo	0.395	0.395	ug/l	22.51	4500.00	966.67		P
97 Mo	0.358	0.358	ug/l	13.12	4500.00	600.00		P
98 Mo	0.380	0.380	ug/l	9.12	4500.00	1626.79		P
107 Ag	0.058	0.058	ug/l	52.99	1800.00	810.00		P
109 Ag	0.049	0.049	ug/l	88.58	1800.00	762.22		P
111 Cd	-0.030	-0.030	ug/l	114.10	4500.00	735.05		P
114 Cd	-0.055	-0.055	ug/l	18.61	4500.00	90.14		P
118 Sn	0.677	0.677	ug/l	12.94	4500.00	2766.67		P
121 Sb	0.141	0.141	ug/l	15.16	4500.00	1365.00		P
123 Sb	0.138	0.138	ug/l	15.21	4500.00	1063.67		P
135 Ba	0.029	0.029	ug/l	69.45	4500.00	163.33		P
137 Ba	0.016	0.016	ug/l	149.42	4500.00	270.00		P
139 La	0.035	0.035	ug/l	16.24	4500.00	686.67		P
140 Ce	0.036	0.036	ug/l	34.21	4500.00	703.33		P
199 Hg	-0.009	-0.009	ug/l	96.51	450.00	75.67		P
200 Hg	0.010	0.010	ug/l	17.09	450.00	111.33		P
202 Hg	-0.003	-0.003	ug/l	248.73	450.00	120.00		P
203 Tl	0.695	0.695	ug/l	5.21	4500.00	5683.33		P
205 Tl	0.688	0.688	ug/l	5.69	4500.00	13500.00		P
206 Pb	-0.017	-0.017	ug/l	18.14	4500.00	730.00		P
207 Pb	-0.023	-0.023	ug/l	9.29	4500.00	630.00		P
208 Pb	-0.002	-0.002	ug/l	410.92	4500.00	2930.00		P
232 Th	0.373	0.373	ug/l	13.16	4500.00	15947.78		P
238 U	0.219	0.219	ug/l	15.01	4500.00	11026.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	716823.38	1.35	609356.69	117.6	60.000002	-	125
72 Ge	962436.63	1.10	849473.38	113.3	60.000002	-	125
89 Y	1540365.80	1.97	1346571.10	114.4	60.000002	-	125
115 In	1818841.90	3.09	1630928.10	111.5	60.000002	-	125
209 Bi	5690894.50	1.73	5261894.50	108.2	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01075

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\039_CCB.D\039_CCB.D#
Date Acquired: Feb 14 2018 01:50 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:30 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	-0.080	ug/l	16.48	0.09	
11 B	-2.935	ug/l	3.30	1.18	
27 Al	-1.125	ug/l	1.32	0.38	
47 Ti	-0.043	ug/l	113.97	0.17	
51 V	-0.068	ug/l	32.49	0.09	
52 Cr	0.007	ug/l	565.08	0.12	
53 Cr	-0.024	ug/l	219.28	0.13	
55 Mn	-0.148	ug/l	3.97	0.14	
57 Fe	5.283	ug/l	89.48	4.00	Fail
59 Co	-0.062	ug/l	19.68	0.04	
60 Ni	-0.090	ug/l	35.92	0.08	
62 Ni	-0.004	ug/l	9342.50	0.32	
63 Cu	-0.104	ug/l	20.48	0.09	
65 Cu	-0.065	ug/l	34.55	0.22	
66 Zn	-0.216	ug/l	16.06	0.10	
75 As	-0.081	ug/l	23.32	0.12	
77 Se	-0.102	ug/l	87.33	1.22	
79 Br	0.715	ug/l	31.25	#VALUE!	
82 Se	-0.162	ug/l	69.86	0.32	
88 Sr	0.061	ug/l	35.63	0.05	Fail
95 Mo	0.098	ug/l	19.16	0.05	Fail
97 Mo	0.117	ug/l	32.56	0.03	Fail
98 Mo	0.034	ug/l	156.40	0.03	Fail
107 Ag	-0.034	ug/l	27.54	0.09	
109 Ag	-0.038	ug/l	22.06	0.10	
111 Cd	-0.001	ug/l	10695.00	0.03	
114 Cd	-0.067	ug/l	3.01	0.03	
118 Sn	0.241	ug/l	34.08	0.05	Fail
121 Sb	0.020	ug/l	36.05	0.03	
123 Sb	0.026	ug/l	39.77	0.04	
135 Ba	-0.029	ug/l	50.92	0.09	
137 Ba	-0.013	ug/l	303.53	0.08	
139 La	0.022	ug/l	27.91	0.02	Fail
140 Ce	0.020	ug/l	41.84	0.02	
199 Hg	-0.006	ug/l	109.70	0.03	
200 Hg	-0.001	ug/l	678.98	0.03	
202 Hg	-0.005	ug/l	74.94	0.03	
203 Tl	0.479	ug/l	7.13	0.03	Fail
205 Tl	0.476	ug/l	7.51	0.02	Fail
206 Pb	-0.039	ug/l	47.40	#VALUE!	
207 Pb	-0.029	ug/l	23.88	#VALUE!	
208 Pb	-0.018	ug/l	71.31	0.02	
232 Th	0.124	ug/l	18.67	0.06	Fail
238 U	0.095	ug/l	5.34	0.02	Fail

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	691803.38	1.92	609356.69	113.5	60 - 125	
72 Ge	933170.00	2.62	849473.38	109.9	60 - 125	
89 Y	1490690.80	1.88	1346571.10	110.7	60 - 125	
115 In	1748740.10	1.52	1630928.10	107.2	60 - 125	
209 Bi	5513438.00	1.04	5261894.50	104.8	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

11 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\045SMPL.D\045SMPL.D#
Date Acquired: Feb 14 2018 02:06 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: MB-118409
Misc Info: 6010.20-SPLP
Vial Number: 1208
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.112	-0.112	ug/l	13.08	4500.00	101.11		P
11 B	86.530	86.530	ug/l	0.28	4500.00	54928.88		P
27 Al	69.890	69.890	ug/l	1.88	4500.00	172226.59		P
47 Ti	1.426	1.426	ug/l	16.16	4500.00	573.33		P
51 V	-0.095	-0.095	ug/l	392.77	4500.00	510.23		P
52 Cr	3.007	3.007	ug/l	11.17	4500.00	14913.33		P
53 Cr	27.920	27.920	ug/l	7.06	4500.00	13130.00		P
55 Mn	0.219	0.219	ug/l	12.65	4500.00	2446.67		P
57 Fe	20.710	20.710	ug/l	11.79	4500.00	8763.33		P
59 Co	-0.015	-0.015	ug/l	176.20	4500.00	940.00		P
60 Ni	0.773	0.773	ug/l	1.40	4500.00	1063.33		P
62 Ni	0.942	0.942	ug/l	44.78	4500.00	336.67		P
63 Cu	7.615	7.615	ug/l	4.28	4500.00	20723.33		P
65 Cu	0.687	0.687	ug/l	11.07	4500.00	1153.33		P
66 Zn	3.898	3.898	ug/l	3.50	4500.00	3726.12		P
75 As	0.441	0.441	ug/l	81.44	4500.00	682.45		P
77 Se	46.060	46.060	ug/l	4.04	4500.00	2869.00		P
79 Br	10.650	10.650	ug/l	---	#VALUE!	1676.67		P
82 Se	-0.043	-0.043	ug/l	431.45	4500.00	22.33		P
88 Sr	1.785	1.785	ug/l	2.38	4500.00	15243.33		P
95 Mo	0.883	0.883	ug/l	11.73	4500.00	1703.33		P
97 Mo	0.962	0.962	ug/l	13.38	4500.00	1176.67		P
98 Mo	0.851	0.851	ug/l	9.12	4500.00	2793.67		P
107 Ag	0.880	0.880	ug/l	52.38	1800.00	4621.11		P
109 Ag	0.832	0.832	ug/l	51.00	1800.00	4257.78		P
111 Cd	-0.199	-0.199	ug/l	24.91	4500.00	509.46		P
114 Cd	-0.282	-0.282	ug/l	13.11	4500.00	-543.26		P
118 Sn	3.776	3.776	ug/l	9.27	4500.00	12053.33		P
121 Sb	0.436	0.436	ug/l	11.61	4500.00	2650.67		P
123 Sb	0.434	0.434	ug/l	13.01	4500.00	2075.33		P
135 Ba	9.962	9.962	ug/l	2.11	4500.00	10963.33		P
137 Ba	10.400	10.400	ug/l	1.33	4500.00	20196.67		P
139 La	0.022	0.022	ug/l	8.28	4500.00	420.00		P
140 Ce	0.035	0.035	ug/l	4.54	4500.00	676.67		P
199 Hg	0.116	0.116	ug/l	4.68	450.00	208.67		P
200 Hg	0.176	0.176	ug/l	6.15	450.00	362.33		P
202 Hg	0.122	0.122	ug/l	6.19	450.00	354.00		P
203 Tl	3.729	3.729	ug/l	45.43	4500.00	23560.00		P
205 Tl	3.747	3.747	ug/l	47.37	4500.00	56663.33		P
206 Pb	0.617	0.617	ug/l	13.03	4500.00	3770.00		P
207 Pb	0.656	0.656	ug/l	13.36	4500.00	3643.33		P
208 Pb	0.669	0.669	ug/l	13.17	4500.00	16330.00		P
232 Th	11.220	11.220	ug/l	4.59	4500.00	276648.91		P
238 U	-0.022	-0.022	ug/l	52.26	4500.00	3343.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	757250.00	3.22	609356.69	124.3	60.000002	-	125
72 Ge	947011.31	2.30	849473.38	111.5	60.000002	-	125
89 Y	1555115.10	3.90	1346571.10	115.5	60.000002	-	125
115 In	1761176.90	3.44	1630928.10	108.0	60.000002	-	125
209 Bi	5050941.50	4.67	5261894.50	96.0	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01077

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\046SMPL.D\046SMPL.D#
Date Acquired: Feb 14 2018 02:08 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020067-001A
Misc Info: 6010.20-SPLP
Vial Number: 1211
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.730	0.730	ug/l	4.67	4500.00	996.67		P
11 B	271.200	271.200	ug/l	4.85	4500.00	176244.41		P
27 Al	18,170.000	18170.000	ug/l	4.50	4500.00	46498580.00		A
47 Ti	201.500	201.500	ug/l	6.20	4500.00	64930.00		P
51 V	33.630	33.630	ug/l	4.53	4500.00	155181.59		P
52 Cr	16.230	16.230	ug/l	5.59	4500.00	67856.66		P
53 Cr	37.270	37.270	ug/l	8.72	4500.00	17573.33		P
55 Mn	107.500	107.500	ug/l	4.72	4500.00	568300.00		P
57 Fe	17,220.000	17220.000	ug/l	2.84	4500.00	2020067.00		A
59 Co	3.311	3.311	ug/l	6.03	4500.00	16910.00		P
60 Ni	9.129	9.129	ug/l	4.80	4500.00	10093.33		P
62 Ni	9.467	9.467	ug/l	13.74	4500.00	1713.33		P
63 Cu	8.484	8.484	ug/l	5.44	4500.00	23183.33		P
65 Cu	5.100	5.100	ug/l	4.04	4500.00	6806.67		P
66 Zn	35.840	35.840	ug/l	5.52	4500.00	31247.70		P
75 As	4.238	4.238	ug/l	3.60	4500.00	4298.83		P
77 Se	41.600	41.600	ug/l	4.89	4500.00	2616.67		P
79 Br	12.280	12.280	ug/l	---	#VALUE!	1916.67		P
82 Se	0.112	0.112	ug/l	128.35	4500.00	35.40		P
88 Sr	36.930	36.930	ug/l	6.06	4500.00	301080.00		P
95 Mo	1.030	1.030	ug/l	11.39	4500.00	1960.00		P
97 Mo	1.116	1.116	ug/l	25.12	4500.00	1350.00		P
98 Mo	0.991	0.991	ug/l	12.38	4500.00	3199.93		P
107 Ag	0.195	0.195	ug/l	27.36	1800.00	1447.78		P
109 Ag	0.176	0.176	ug/l	30.86	1800.00	1327.78		P
111 Cd	-0.005	-0.005	ug/l	527.70	4500.00	751.67		P
114 Cd	-0.245	-0.245	ug/l	8.04	4500.00	-446.95		P
118 Sn	3.436	3.436	ug/l	11.31	4500.00	11176.67		P
121 Sb	0.568	0.568	ug/l	13.69	4500.00	3291.33		P
123 Sb	0.557	0.557	ug/l	15.17	4500.00	2541.67		P
135 Ba	125.600	125.600	ug/l	0.71	4500.00	138596.70		P
137 Ba	126.400	126.400	ug/l	0.88	4500.00	246256.59		P
139 La	12.540	12.540	ug/l	1.26	4500.00	231886.59		P
140 Ce	25.680	25.680	ug/l	1.70	4500.00	460100.00		P
199 Hg	0.098	0.098	ug/l	1.35	450.00	200.33		P
200 Hg	0.160	0.160	ug/l	10.74	450.00	358.00		P
202 Hg	0.120	0.120	ug/l	10.64	450.00	372.33		P
203 Tl	0.899	0.899	ug/l	12.26	4500.00	6673.33		P
205 Tl	0.894	0.894	ug/l	16.44	4500.00	15903.33		P
206 Pb	9.468	9.468	ug/l	4.27	4500.00	50390.00		P
207 Pb	8.444	8.444	ug/l	4.11	4500.00	41523.33		P
208 Pb	8.873	8.873	ug/l	4.00	4500.00	195840.00		P
232 Th	8.583	8.583	ug/l	5.07	4500.00	226120.00		P
238 U	0.915	0.915	ug/l	5.46	4500.00	30090.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	802420.00	3.84	609356.69	131.7	60.000002	- 125	ISFail
72 Ge	955795.56	6.00	849473.38	112.5	60.000002	- 125	
89 Y	1652838.60	4.79	1346571.10	122.7	60.000002	- 125	
115 In	1785518.30	3.43	1630928.10	109.5	60.000002	- 125	
209 Bi	5356995.50	4.92	5261894.50	101.8	60.000002	- 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
1 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

ED_004985_00011411-01078

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\047SMPL.D\047SMPL.D#
Date Acquired: Feb 14 2018 02:11 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020067-001ADIL
Misc Info: 6010.20-SPLP
Vial Number: 1212
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 5.00
Autodil Factor: Undiluted
Final Dil Factor: 5.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.488	0.098	ug/l	38.56	4500.00	346.67		P
11 B	269.450	53.890	ug/l	1.23	4500.00	39350.00		P
27 Al	18,650.000	3730.000	ug/l	0.41	4500.00	10066250.00		A
47 Ti	212.950	42.590	ug/l	2.18	4500.00	15526.67		P
51 V	30.335	6.067	ug/l	1.09	4500.00	32300.99		P
52 Cr	15.965	3.193	ug/l	3.75	4500.00	17740.00		P
53 Cr	39.265	7.853	ug/l	2.23	4500.00	4366.67		P
55 Mn	104.150	20.830	ug/l	0.86	4500.00	124806.70		P
57 Fe	17,110.000	3422.000	ug/l	1.69	4500.00	456500.00		P
59 Co	2.673	0.535	ug/l	9.30	4500.00	4030.00		P
60 Ni	8.660	1.732	ug/l	9.10	4500.00	2366.67		P
62 Ni	6.695	1.339	ug/l	23.42	4500.00	453.33		P
63 Cu	8.360	1.672	ug/l	9.31	4500.00	5736.67		P
65 Cu	5.515	1.103	ug/l	7.42	4500.00	1903.33		P
66 Zn	39.200	7.840	ug/l	4.90	4500.00	8030.26		P
75 As	4.380	0.876	ug/l	3.06	4500.00	1232.54		P
77 Se	40.185	8.037	ug/l	5.16	4500.00	622.00		P
79 Br	14.755	2.951	ug/l	---	#VALUE!	706.67		P
82 Se	0.145	0.029	ug/l	434.66	4500.00	32.00		P
88 Sr	35.620	7.124	ug/l	1.52	4500.00	66006.66		P
95 Mo	0.190	0.038	ug/l	106.86	4500.00	430.00		P
97 Mo	-0.082	-0.016	ug/l	423.18	4500.00	243.33		P
98 Mo	0.083	0.017	ug/l	42.96	4500.00	731.80		P
107 Ag	-0.394	-0.079	ug/l	5.13	1800.00	160.00		P
109 Ag	-0.444	-0.089	ug/l	5.39	1800.00	130.00		P
111 Cd	-0.419	-0.084	ug/l	55.27	4500.00	742.43		P
114 Cd	-0.536	-0.107	ug/l	20.93	4500.00	-66.13		P
118 Sn	1.533	0.307	ug/l	13.44	4500.00	1786.67		P
121 Sb	-0.146	-0.029	ug/l	37.19	4500.00	642.67		P
123 Sb	-0.160	-0.032	ug/l	25.01	4500.00	499.33		P
135 Ba	120.000	24.000	ug/l	2.20	4500.00	30080.00		P
137 Ba	121.650	24.330	ug/l	2.30	4500.00	53803.33		P
139 La	11.995	2.399	ug/l	3.50	4500.00	50206.66		P
140 Ce	24.345	4.869	ug/l	2.27	4500.00	98680.00		P
199 Hg	0.024	0.005	ug/l	121.69	450.00	99.00		P
200 Hg	0.044	0.009	ug/l	97.35	450.00	116.33		P
202 Hg	0.019	0.004	ug/l	174.56	450.00	143.00		P
203 Tl	2.046	0.409	ug/l	5.39	4500.00	3906.67		P
205 Tl	1.922	0.384	ug/l	1.07	4500.00	8926.67		P
206 Pb	10.760	2.152	ug/l	1.22	4500.00	13576.67		P
207 Pb	9.800	1.960	ug/l	1.80	4500.00	11466.67		P
208 Pb	10.255	2.051	ug/l	1.63	4500.00	53413.33		P
232 Th	3.660	0.732	ug/l	7.27	4500.00	27257.78		P
238 U	0.455	0.091	ug/l	10.22	4500.00	7616.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	846149.69	1.36	609356.69	138.9	60.000002	- 125	ISFail
72 Ge	1071650.50	0.86	849473.38	126.2	60.000002	- 125	ISFail
89 Y	1763438.40	1.77	1346571.10	131.0	60.000002	- 125	
115 In	2019063.40	1.73	1630928.10	123.8	60.000002	- 125	
209 Bi	6029840.50	0.15	5261894.50	114.6	60.000002	- 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
2 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

ED_004985_00011411-01079

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\048SMPL.D\048SMPL.D#
Date Acquired: Feb 14 2018 02:14 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020067-002A
Misc Info: 6010.20-SPLP
Vial Number: 1214
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.586	0.586	ug/l	6.81	4500.00	787.78		P
11 B	162.100	162.100	ug/l	3.15	4500.00	99308.88		P
27 Al	12,080.000	12080.000	ug/l	1.96	4500.00	28823380.00		A
47 Ti	164.800	164.800	ug/l	5.79	4500.00	51343.33		P
51 V	31.390	31.390	ug/l	3.73	4500.00	140090.80		P
52 Cr	11.990	11.990	ug/l	6.02	4500.00	49216.66		P
53 Cr	30.790	30.790	ug/l	9.33	4500.00	14063.33		P
55 Mn	144.000	144.000	ug/l	3.88	4500.00	735016.63		P
57 Fe	20,420.000	20420.000	ug/l	4.33	4500.00	2314142.00		A
59 Co	5.074	5.074	ug/l	5.66	4500.00	24523.33		P
60 Ni	6.584	6.584	ug/l	3.06	4500.00	7103.33		P
62 Ni	6.432	6.432	ug/l	16.34	4500.00	1183.33		P
63 Cu	8.942	8.942	ug/l	3.06	4500.00	23600.00		P
65 Cu	5.552	5.552	ug/l	6.82	4500.00	7140.00		P
66 Zn	30.580	30.580	ug/l	4.84	4500.00	25831.76		P
75 As	4.091	4.091	ug/l	5.83	4500.00	4016.91		P
77 Se	41.190	41.190	ug/l	4.63	4500.00	2505.33		P
79 Br	9.800	9.800	ug/l	---	#VALUE!	1526.67		P
82 Se	0.041	0.041	ug/l	206.20	4500.00	28.73		P
88 Sr	54.210	54.210	ug/l	3.86	4500.00	427000.00		P
95 Mo	1.744	1.744	ug/l	2.53	4500.00	3060.00		P
97 Mo	1.852	1.852	ug/l	5.65	4500.00	2066.67		P
98 Mo	1.874	1.874	ug/l	5.44	4500.00	5439.44		P
107 Ag	0.109	0.109	ug/l	68.40	1800.00	1015.56		P
109 Ag	0.093	0.093	ug/l	87.04	1800.00	923.33		P
111 Cd	0.010	0.010	ug/l	211.20	4500.00	765.54		P
114 Cd	-0.195	-0.195	ug/l	12.23	4500.00	-299.94		P
118 Sn	2.654	2.654	ug/l	5.16	4500.00	8713.33		P
121 Sb	0.687	0.687	ug/l	2.41	4500.00	3790.67		P
123 Sb	0.703	0.703	ug/l	3.56	4500.00	3026.33		P
135 Ba	110.900	110.900	ug/l	7.42	4500.00	120953.30		P
137 Ba	110.900	110.900	ug/l	6.66	4500.00	213560.00		P
139 La	12.250	12.250	ug/l	7.88	4500.00	223736.59		P
140 Ce	25.250	25.250	ug/l	7.22	4500.00	446963.31		P
199 Hg	0.087	0.087	ug/l	4.59	450.00	183.67		P
200 Hg	0.153	0.153	ug/l	3.50	450.00	340.67		P
202 Hg	0.105	0.105	ug/l	16.40	450.00	334.00		P
203 Tl	0.339	0.339	ug/l	19.35	4500.00	2943.33		P
205 Tl	0.349	0.349	ug/l	13.35	4500.00	7226.67		P
206 Pb	13.470	13.470	ug/l	4.67	4500.00	70203.33		P
207 Pb	11.940	11.940	ug/l	5.76	4500.00	57433.33		P
208 Pb	12.750	12.750	ug/l	5.52	4500.00	275293.31		P
232 Th	5.986	5.986	ug/l	2.63	4500.00	156746.70		P
238 U	2.926	2.926	ug/l	5.10	4500.00	85540.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	748393.38	5.30	609356.69	122.8	60.000002	-	125
72 Ge	923701.50	5.26	849473.38	108.7	60.000002	-	125
89 Y	1625017.60	6.05	1346571.10	120.7	60.000002	-	125
115 In	1770546.10	8.31	1630928.10	108.6	60.000002	-	125
209 Bi	5276197.50	7.32	5261894.50	100.3	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01080

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\049SMPL.D\049SMPL.D#
Date Acquired: Feb 14 2018 02:16 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: LCS-118409
Misc Info: 6010.20-SPLP
Vial Number: 1209
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	236.100	236.100	ug/l	2.70	4500.00	230491.09		P
11 B	584.500	584.500	ug/l	1.14	4500.00	347774.41		P
27 Al	2,666.000	2666.000	ug/l	2.22	4500.00	6296817.00		A
47 Ti	552.600	552.600	ug/l	3.34	4500.00	174310.00		P
51 V	551.300	551.300	ug/l	1.14	4500.00	2479956.00		A
52 Cr	531.300	531.300	ug/l	2.41	4500.00	2084061.00		A
53 Cr	558.900	558.900	ug/l	1.72	4500.00	255476.59		P
55 Mn	2,571.000	2571.000	ug/l	3.96	4500.00	13275670.00		A
57 Fe	2,643.000	2643.000	ug/l	1.46	4500.00	309070.00		P
59 Co	525.300	525.300	ug/l	1.52	4500.00	2473562.00		A
60 Ni	521.100	521.100	ug/l	1.14	4500.00	551920.00		P
62 Ni	523.600	523.600	ug/l	0.79	4500.00	83083.33		P
63 Cu	509.600	509.600	ug/l	1.43	4500.00	1326928.00		A
65 Cu	509.400	509.400	ug/l	2.81	4500.00	638526.69		P
66 Zn	451.400	451.400	ug/l	2.06	4500.00	381144.41		P
75 As	481.200	481.200	ug/l	2.44	4500.00	448875.69		P
77 Se	446.700	446.700	ug/l	1.28	4500.00	26972.00		P
79 Br	9.154	9.154	ug/l	---	#VALUE!	1456.67		P
82 Se	401.600	401.600	ug/l	2.23	4500.00	32219.53		P
88 Sr	523.300	523.300	ug/l	1.51	4500.00	4171635.00		A
95 Mo	551.600	551.600	ug/l	2.34	4500.00	870263.31		P
97 Mo	554.400	554.400	ug/l	2.51	4500.00	549403.31		P
98 Mo	553.500	553.500	ug/l	2.03	4500.00	1437453.00		A
107 Ag	260.200	260.200	ug/l	5.31	1800.00	1237028.00		A
109 Ag	266.000	266.000	ug/l	4.03	1800.00	1218058.00		A
111 Cd	234.900	234.900	ug/l	4.15	4500.00	284426.59		P
114 Cd	234.500	234.500	ug/l	2.10	4500.00	657417.63		P
118 Sn	566.200	566.200	ug/l	4.16	4500.00	1720099.00		A
121 Sb	509.700	509.700	ug/l	2.47	4500.00	2303396.00		A
123 Sb	499.400	499.400	ug/l	6.22	4500.00	1762266.00		A
135 Ba	5,515.000	5515.000	ug/l	2.73	4500.00	6040889.00		A
137 Ba	5,322.000	5322.000	ug/l	3.68	4500.00	10279550.00		A
139 La	502.900	502.900	ug/l	5.26	4500.00	9229783.00		A
140 Ce	503.900	503.900	ug/l	3.70	4500.00	8961217.00		A
199 Hg	0.070	0.070	ug/l	34.51	450.00	161.33		P
200 Hg	0.107	0.107	ug/l	6.49	450.00	263.33		P
202 Hg	0.082	0.082	ug/l	12.95	450.00	286.00		P
203 Tl	499.500	499.500	ug/l	6.09	4500.00	3218078.00		A
205 Tl	497.300	497.300	ug/l	2.32	4500.00	7688014.00		A
206 Pb	519.900	519.900	ug/l	4.63	4500.00	2669926.00		A
207 Pb	509.500	509.500	ug/l	7.06	4500.00	2410510.00		A
208 Pb	507.500	507.500	ug/l	5.17	4500.00	10813350.00		A
232 Th	557.900	557.900	ug/l	5.54	4500.00	14031400.00		A
238 U	539.500	539.500	ug/l	4.89	4500.00	14959690.00		A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	740722.13	2.88	609356.69	121.6	60.000002	-	125
72 Ge	935446.63	3.23	849473.38	110.1	60.000002	-	125
89 Y	1549579.60	2.95	1346571.10	115.1	60.000002	-	125
115 In	1774316.80	4.99	1630928.10	108.8	60.000002	-	125
209 Bi	5255090.50	7.26	5261894.50	99.9	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01081

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\050CCV.D\050CCV.D#
Date Acquired: Feb 14 2018 02:19 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	49.870	ug/l	4.22	50.00	85 - 115	90 - 110	
11 B	52.610	ug/l	1.49	50.00	85 - 115	90 - 110	
27 Al	66.180	ug/l	4.94	50.00	85 - 115	90 - 110	>15%
47 Ti	54.420	ug/l	6.82	50.00	85 - 115	90 - 110	
51 V	52.570	ug/l	5.99	50.00	85 - 115	90 - 110	
52 Cr	52.830	ug/l	5.95	50.00	85 - 115	90 - 110	
53 Cr	53.590	ug/l	4.78	50.00	85 - 115	90 - 110	
55 Mn	54.750	ug/l	6.29	50.00	85 - 115	90 - 110	
57 Fe	1380.000	ug/l	5.88	1300.00	85 - 115	90 - 110	
59 Co	52.260	ug/l	6.22	50.00	85 - 115	90 - 110	
60 Ni	51.990	ug/l	6.12	50.00	85 - 115	90 - 110	
62 Ni	51.960	ug/l	3.26	50.00	85 - 115	90 - 110	
63 Cu	52.270	ug/l	5.29	50.00	85 - 115	90 - 110	
65 Cu	52.040	ug/l	6.08	50.00	85 - 115	90 - 110	
66 Zn	51.950	ug/l	6.08	50.00	85 - 115	90 - 110	
75 As	50.830	ug/l	5.29	50.00	85 - 115	90 - 110	
77 Se	51.800	ug/l	7.36	50.00	85 - 115	90 - 110	
79 Br	1.632	ug/l	41.16	---	#### - ####	#### - ####	
82 Se	51.150	ug/l	3.86	50.00	85 - 115	90 - 110	
88 Sr	50.840	ug/l	5.47	50.00	85 - 115	90 - 110	
95 Mo	51.410	ug/l	5.11	50.00	85 - 115	90 - 110	
97 Mo	50.910	ug/l	2.68	50.00	85 - 115	90 - 110	
98 Mo	51.260	ug/l	4.14	50.00	85 - 115	90 - 110	
107 Ag	19.420	ug/l	2.85	20.00	85 - 115	90 - 110	
109 Ag	19.660	ug/l	2.12	20.00	85 - 115	90 - 110	
111 Cd	50.340	ug/l	2.35	50.00	85 - 115	90 - 110	
114 Cd	49.770	ug/l	3.47	50.00	85 - 115	90 - 110	
118 Sn	49.140	ug/l	5.33	50.00	85 - 115	90 - 110	
121 Sb	49.040	ug/l	4.26	50.00	85 - 115	90 - 110	
123 Sb	49.420	ug/l	3.91	50.00	85 - 115	90 - 110	
135 Ba	53.000	ug/l	6.77	50.00	85 - 115	90 - 110	
137 Ba	52.750	ug/l	3.95	50.00	85 - 115	90 - 110	
139 La	49.640	ug/l	3.49	50.00	85 - 115	90 - 110	
140 Ce	49.520	ug/l	3.34	50.00	85 - 115	90 - 110	
199 Hg	0.999	ug/l	9.27	1.00	85 - 115	90 - 110	
200 Hg	0.978	ug/l	3.50	1.00	85 - 115	90 - 110	
202 Hg	1.054	ug/l	2.27	1.00	85 - 115	90 - 110	
203 Tl	50.850	ug/l	4.73	50.00	85 - 115	90 - 110	
205 Tl	51.720	ug/l	4.45	50.00	85 - 115	90 - 110	
206 Pb	51.550	ug/l	4.18	50.00	85 - 115	90 - 110	
207 Pb	51.100	ug/l	4.68	50.00	85 - 115	90 - 110	
208 Pb	51.170	ug/l	4.30	50.00	85 - 115	90 - 110	
232 Th	45.030	ug/l	3.76	50.00	85 - 115	90 - 110	
238 U	49.630	ug/l	2.73	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	826373.44	0.36	609356.69	135.6	60 - 125	ISFail
72 Ge	1066269.40	2.79	849473.38	125.5	60 - 125	ISFail
89 Y	1741408.40	0.78	1346571.10	129.3	60 - 125	
115 In	1996318.40	1.18	1630928.10	122.4	60 - 125	
209 Bi	5967845.50	1.37	5261894.50	113.4	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

QC Range 1
1 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
1 :Element Failures 8 :Max. Number of Failures Allowed

2 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

ED_004985_00011411-01082

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\051SMPL.D\051SMPL.D#
Date Acquired: Feb 14 2018 02:21 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.027	0.027	ug/l	167.88	4500.00	240.00		P
11 B	0.614	0.614	ug/l	44.82	4500.00	3055.56		P
27 Al	6.853	6.853	ug/l	6.60	4500.00	19983.33		P
47 Ti	0.299	0.299	ug/l	34.86	4500.00	220.00		P
51 V	0.185	0.185	ug/l	22.46	4500.00	1818.14		P
52 Cr	0.339	0.339	ug/l	8.39	4500.00	4463.33		P
53 Cr	0.295	0.295	ug/l	18.69	4500.00	373.33		P
55 Mn	1.153	1.153	ug/l	7.79	4500.00	7523.33		P
57 Fe	17.880	17.880	ug/l	6.35	4500.00	8653.33		P
59 Co	0.191	0.191	ug/l	20.59	4500.00	1973.33		P
60 Ni	0.160	0.160	ug/l	47.46	4500.00	416.67		P
62 Ni	-0.049	-0.049	ug/l	879.61	4500.00	183.33		P
63 Cu	0.171	0.171	ug/l	5.05	4500.00	1143.33		P
65 Cu	0.164	0.164	ug/l	44.41	4500.00	503.33		P
66 Zn	-0.068	-0.068	ug/l	117.80	4500.00	348.95		P
75 As	0.253	0.253	ug/l	13.81	4500.00	514.01		P
77 Se	0.411	0.411	ug/l	17.99	4500.00	86.67		P
79 Br	0.152	0.152	ug/l	---	#VALUE!	246.67		P
82 Se	0.221	0.221	ug/l	40.66	4500.00	45.00		P
88 Sr	0.189	0.189	ug/l	25.12	4500.00	2416.67		P
95 Mo	0.603	0.603	ug/l	9.31	4500.00	1300.00		P
97 Mo	0.626	0.626	ug/l	8.94	4500.00	870.00		P
98 Mo	0.559	0.559	ug/l	7.87	4500.00	2099.44		P
107 Ag	0.180	0.180	ug/l	23.87	1800.00	1401.11		P
109 Ag	0.200	0.200	ug/l	20.69	1800.00	1466.67		P
111 Cd	0.074	0.074	ug/l	54.04	4500.00	862.84		P
114 Cd	0.016	0.016	ug/l	173.56	4500.00	292.25		P
118 Sn	0.988	0.988	ug/l	5.18	4500.00	3723.33		P
121 Sb	0.320	0.320	ug/l	0.60	4500.00	2193.33		P
123 Sb	0.325	0.325	ug/l	3.47	4500.00	1740.00		P
135 Ba	2.220	2.220	ug/l	7.53	4500.00	2616.67		P
137 Ba	2.178	2.178	ug/l	10.83	4500.00	4540.00		P
139 La	0.274	0.274	ug/l	7.39	4500.00	5180.00		P
140 Ce	0.267	0.267	ug/l	9.79	4500.00	4913.33		P
199 Hg	0.004	0.004	ug/l	355.98	450.00	88.00		P
200 Hg	0.010	0.010	ug/l	71.60	450.00	106.00		P
202 Hg	0.000	0.000	ug/l	1823.10	450.00	119.33		P
203 Tl	1.305	1.305	ug/l	8.34	4500.00	9453.33		P
205 Tl	1.299	1.299	ug/l	6.03	4500.00	22563.33		P
206 Pb	0.596	0.596	ug/l	10.06	4500.00	3936.67		P
207 Pb	0.575	0.575	ug/l	4.67	4500.00	3516.67		P
208 Pb	0.594	0.594	ug/l	7.77	4500.00	15893.33		P
232 Th	0.663	0.663	ug/l	6.23	4500.00	22654.44		P
238 U	0.164	0.164	ug/l	11.14	4500.00	8926.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	757630.00	1.03	609356.69	124.3	60.000002	-	125
72 Ge	971542.81	1.68	849473.38	114.4	60.000002	-	125
89 Y	1586261.80	0.75	1346571.10	117.8	60.000002	-	125
115 In	1815428.30	2.52	1630928.10	111.3	60.000002	-	125
209 Bi	5407544.50	0.96	5261894.50	102.8	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01083

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\052_CCB.D\052_CCB.D#
Date Acquired: Feb 14 2018 02:24 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:30 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	-0.050	ug/l	48.12	0.09	
11 B	-2.108	ug/l	5.95	1.18	
27 Al	3.857	ug/l	6.33	0.38	Fail
47 Ti	-0.015	ug/l	956.04	0.17	
51 V	0.079	ug/l	59.21	0.09	
52 Cr	0.142	ug/l	22.86	0.12	Fail
53 Cr	0.124	ug/l	40.86	0.13	
55 Mn	0.624	ug/l	11.34	0.14	Fail
57 Fe	12.300	ug/l	14.36	4.00	Fail
59 Co	0.105	ug/l	17.85	0.04	Fail
60 Ni	0.068	ug/l	32.96	0.08	
62 Ni	0.048	ug/l	553.08	0.32	
63 Cu	0.074	ug/l	77.10	0.09	
65 Cu	0.051	ug/l	112.52	0.22	
66 Zn	0.003	ug/l	4081.30	0.10	
75 As	0.019	ug/l	166.72	0.12	
77 Se	0.329	ug/l	14.64	1.22	
79 Br	-0.007	ug/l	4998.70	#VALUE!	
82 Se	-0.030	ug/l	378.76	0.32	
88 Sr	0.073	ug/l	24.95	0.05	Fail
95 Mo	0.168	ug/l	44.51	0.05	Fail
97 Mo	0.211	ug/l	34.63	0.03	Fail
98 Mo	0.181	ug/l	35.18	0.03	Fail
107 Ag	0.023	ug/l	55.48	0.09	
109 Ag	0.014	ug/l	136.87	0.10	
111 Cd	0.068	ug/l	6.56	0.03	Fail
114 Cd	-0.017	ug/l	47.83	0.03	
118 Sn	0.347	ug/l	21.99	0.05	Fail
121 Sb	0.113	ug/l	3.82	0.03	Fail
123 Sb	0.119	ug/l	8.28	0.04	Fail
135 Ba	1.199	ug/l	9.06	0.09	Fail
137 Ba	1.238	ug/l	12.42	0.08	Fail
139 La	0.140	ug/l	8.43	0.02	Fail
140 Ce	0.158	ug/l	12.09	0.02	Fail
199 Hg	-0.006	ug/l	159.99	0.03	
200 Hg	-0.005	ug/l	23.98	0.03	
202 Hg	-0.013	ug/l	70.30	0.03	
203 Tl	1.417	ug/l	1.06	0.03	Fail
205 Tl	1.415	ug/l	4.99	0.02	Fail
206 Pb	0.312	ug/l	10.95	#VALUE!	
207 Pb	0.320	ug/l	12.13	#VALUE!	
208 Pb	0.325	ug/l	6.03	0.02	Fail
232 Th	0.285	ug/l	16.57	0.06	Fail
238 U	0.034	ug/l	21.73	0.02	Fail

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	733250.00	1.33	609356.69	120.3	60 - 125	
72 Ge	964746.88	2.62	849473.38	113.6	60 - 125	
89 Y	1576490.00	1.95	1346571.10	117.1	60 - 125	
115 In	1788956.10	3.10	1630928.10	109.7	60 - 125	
209 Bi	5360677.00	1.53	5261894.50	101.9	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

22 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\053SMPL.D\053SMPL.D#
Date Acquired: Feb 14 2018 02:26 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: LCSD-118409
Misc Info: 6010.20-SPLP
Vial Number: 1210
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	244.700	244.700	ug/l	1.14	4500.00	231143.30		P
11 B	602.800	602.800	ug/l	1.71	4500.00	346872.19		P
27 Al	2,609.000	2609.000	ug/l	1.89	4500.00	5964072.00		A
47 Ti	569.400	569.400	ug/l	2.01	4500.00	174216.70		P
51 V	560.100	560.100	ug/l	3.09	4500.00	2440569.00		A
52 Cr	542.000	542.000	ug/l	2.35	4500.00	2061180.00		A
53 Cr	580.400	580.400	ug/l	2.20	4500.00	257153.30		P
55 Mn	2,648.000	2648.000	ug/l	2.46	4500.00	13261710.00		A
57 Fe	2,689.000	2689.000	ug/l	1.42	4500.00	304820.00		P
59 Co	539.900	539.900	ug/l	1.36	4500.00	2463689.00		A
60 Ni	528.500	528.500	ug/l	1.28	4500.00	542400.00		P
62 Ni	528.700	528.700	ug/l	0.39	4500.00	81353.33		P
63 Cu	524.200	524.200	ug/l	1.35	4500.00	1322880.00		A
65 Cu	513.800	513.800	ug/l	0.83	4500.00	624743.31		P
66 Zn	464.200	464.200	ug/l	1.57	4500.00	380083.31		P
75 As	489.200	489.200	ug/l	3.20	4500.00	442288.50		P
77 Se	452.000	452.000	ug/l	1.70	4500.00	26465.67		P
79 Br	8.277	8.277	ug/l	---	#VALUE!	1300.00		P
82 Se	404.200	404.200	ug/l	2.10	4500.00	31439.93		P
88 Sr	532.300	532.300	ug/l	0.75	4500.00	4114995.00		A
95 Mo	571.600	571.600	ug/l	2.83	4500.00	854920.00		P
97 Mo	571.400	571.400	ug/l	1.79	4500.00	536956.69		P
98 Mo	566.800	566.800	ug/l	2.05	4500.00	1395678.00		A
107 Ag	265.900	265.900	ug/l	1.85	1800.00	1200165.00		A
109 Ag	269.500	269.500	ug/l	3.86	1800.00	1169469.00		A
111 Cd	241.800	241.800	ug/l	3.20	4500.00	277687.69		P
114 Cd	240.800	240.800	ug/l	2.39	4500.00	640112.50		P
118 Sn	573.900	573.900	ug/l	2.21	4500.00	1654126.00		A
121 Sb	517.700	517.700	ug/l	3.41	4500.00	2217296.00		A
123 Sb	505.500	505.500	ug/l	3.41	4500.00	1693334.00		A
135 Ba	5,544.000	5544.000	ug/l	2.28	4500.00	5758488.00		A
137 Ba	5,490.000	5490.000	ug/l	3.76	4500.00	10060860.00		A
139 La	516.600	516.600	ug/l	0.61	4500.00	9005169.00		A
140 Ce	520.100	520.100	ug/l	2.56	4500.00	8774837.00		A
199 Hg	0.088	0.088	ug/l	5.96	450.00	172.67		P
200 Hg	0.121	0.121	ug/l	5.49	450.00	267.00		P
202 Hg	0.080	0.080	ug/l	10.06	450.00	263.33		P
203 Tl	508.200	508.200	ug/l	1.18	4500.00	3073058.00		A
205 Tl	520.600	520.600	ug/l	1.71	4500.00	7539018.00		A
206 Pb	531.100	531.100	ug/l	0.98	4500.00	2559134.00		A
207 Pb	522.500	522.500	ug/l	2.04	4500.00	2321744.00		A
208 Pb	521.800	521.800	ug/l	2.72	4500.00	10429780.00		A
232 Th	583.100	583.100	ug/l	1.83	4500.00	13761260.00		A
238 U	542.800	542.800	ug/l	0.22	4500.00	14122350.00		A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	716460.00	3.48	609356.69	117.6	60.000002	-	125
72 Ge	907002.13	3.61	849473.38	106.8	60.000002	-	125
89 Y	1537127.00	4.30	1346571.10	114.2	60.000002	-	125
115 In	1682415.60	4.61	1630928.10	103.2	60.000002	-	125
209 Bi	4919114.00	3.79	5261894.50	93.5	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01085

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\054SMPL.D\054SMPL.D#
Date Acquired: Feb 14 2018 02:29 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020067-001AMS3
Misc Info: 6010.20-SPLP
Vial Number: 1213
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	223.200	223.200	ug/l	2.79	4500.00	231955.50		P
11 B	754.000	754.000	ug/l	1.88	4500.00	476624.41		P
27 Al	26,580.000	26580.000	ug/l	0.67	4500.00	66814000.00		A
47 Ti	784.800	784.800	ug/l	2.87	4500.00	247356.70		P
51 V	583.000	583.000	ug/l	2.01	4500.00	2618428.00		A
52 Cr	551.300	551.300	ug/l	2.88	4500.00	2159769.00		A
53 Cr	585.400	585.400	ug/l	2.84	4500.00	267260.00		P
55 Mn	2,709.000	2709.000	ug/l	2.67	4500.00	13979590.00		A
57 Fe	20,790.000	20790.000	ug/l	2.45	4500.00	2385763.00		A
59 Co	529.300	529.300	ug/l	3.98	4500.00	2487729.00		A
60 Ni	519.100	519.100	ug/l	2.70	4500.00	548840.00		P
62 Ni	514.100	514.100	ug/l	1.86	4500.00	81480.00		P
63 Cu	504.100	504.100	ug/l	1.90	4500.00	1311011.00		A
65 Cu	515.300	515.300	ug/l	0.89	4500.00	645783.31		P
66 Zn	489.800	489.800	ug/l	2.09	4500.00	413429.69		P
75 As	482.800	482.800	ug/l	2.10	4500.00	449979.19		P
77 Se	441.300	441.300	ug/l	2.69	4500.00	26615.33		P
79 Br	12.200	12.200	ug/l	---	#VALUE!	1870.00		P
82 Se	400.200	400.200	ug/l	2.75	4500.00	32074.13		P
88 Sr	571.300	571.300	ug/l	1.84	4500.00	4549817.00		A
95 Mo	547.100	547.100	ug/l	3.02	4500.00	858486.63		P
97 Mo	549.700	549.700	ug/l	3.15	4500.00	541786.69		P
98 Mo	549.000	549.000	ug/l	3.97	4500.00	1417259.00		A
107 Ag	264.200	264.200	ug/l	3.79	1800.00	1250119.00		A
109 Ag	260.000	260.000	ug/l	2.49	1800.00	1184499.00		A
111 Cd	238.000	238.000	ug/l	2.97	4500.00	286771.91		P
114 Cd	235.800	235.800	ug/l	2.40	4500.00	657549.13		P
118 Sn	570.100	570.100	ug/l	3.95	4500.00	1723176.00		A
121 Sb	486.500	486.500	ug/l	2.67	4500.00	2186929.00		A
123 Sb	497.600	497.600	ug/l	3.39	4500.00	1749013.00		A
135 Ba	5,753.000	5753.000	ug/l	2.78	4500.00	6267937.00		A
137 Ba	5,611.000	5611.000	ug/l	3.75	4500.00	10783900.00		A
139 La	528.200	528.200	ug/l	4.14	4500.00	9648552.00		A
140 Ce	540.200	540.200	ug/l	4.74	4500.00	9554811.00		A
199 Hg	0.087	0.087	ug/l	18.26	450.00	182.33		P
200 Hg	0.105	0.105	ug/l	4.10	450.00	258.67		P
202 Hg	0.081	0.081	ug/l	4.93	450.00	283.33		P
203 Tl	503.800	503.800	ug/l	2.68	4500.00	3241372.00		A
205 Tl	507.000	507.000	ug/l	2.38	4500.00	7814462.00		A
206 Pb	536.300	536.300	ug/l	2.49	4500.00	2748509.00		A
207 Pb	528.100	528.100	ug/l	1.91	4500.00	2496661.00		A
208 Pb	523.900	523.900	ug/l	2.12	4500.00	11143910.00		A
232 Th	571.100	571.100	ug/l	0.97	4500.00	14345740.00		A
238 U	539.900	539.900	ug/l	3.09	4500.00	14937390.00		A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	788463.38	2.90	609356.69	129.4	60.000002	- 125	ISFail
72 Ge	934581.81	3.11	849473.38	110.0	60.000002	- 125	
89 Y	1613476.40	3.24	1346571.10	119.8	60.000002	- 125	
115 In	1765303.90	5.05	1630928.10	108.2	60.000002	- 125	
209 Bi	5236332.00	4.71	5261894.50	99.5	60.000002	- 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
1 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

ED_004985_00011411-01086

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\055SMPL.D\055SMPL.D#
Date Acquired: Feb 14 2018 02:31 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: B18020067-002AMS3
Misc Info: 6010.20-SPLP
Vial Number: 1215
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	230.700	230.700	ug/l	2.50	4500.00	230303.30		P
11 B	663.100	663.100	ug/l	5.01	4500.00	402976.69		P
27 Al	17,790.000	17790.000	ug/l	4.09	4500.00	42967968.00		A
47 Ti	729.500	729.500	ug/l	5.06	4500.00	228573.30		P
51 V	579.500	579.500	ug/l	5.76	4500.00	2588328.00		A
52 Cr	541.100	541.100	ug/l	5.66	4500.00	2106730.00		A
53 Cr	572.300	572.300	ug/l	4.86	4500.00	259783.30		P
55 Mn	2,845.000	2845.000	ug/l	5.91	4500.00	14585410.00		A
57 Fe	22,290.000	22290.000	ug/l	5.07	4500.00	2543747.00		A
59 Co	545.500	545.500	ug/l	3.14	4500.00	2550252.00		A
60 Ni	531.200	531.200	ug/l	5.74	4500.00	558133.31		P
62 Ni	539.800	539.800	ug/l	4.82	4500.00	85030.00		P
63 Cu	524.700	524.700	ug/l	6.43	4500.00	1355097.00		A
65 Cu	527.100	527.100	ug/l	5.23	4500.00	656336.63		P
66 Zn	495.400	495.400	ug/l	6.33	4500.00	415216.41		P
75 As	485.300	485.300	ug/l	5.03	4500.00	449554.50		P
77 Se	450.200	450.200	ug/l	4.45	4500.00	26988.00		P
79 Br	11.220	11.220	ug/l	---	#VALUE!	1720.00		P
82 Se	404.600	404.600	ug/l	4.96	4500.00	32239.93		P
88 Sr	572.800	572.800	ug/l	4.35	4500.00	4536521.00		A
95 Mo	552.900	552.900	ug/l	3.64	4500.00	871393.00		M
97 Mo	554.200	554.200	ug/l	4.95	4500.00	548533.31		P
98 Mo	556.300	556.300	ug/l	5.83	4500.00	1442713.00		A
107 Ag	257.900	257.900	ug/l	7.72	1800.00	1226410.00		A
109 Ag	277.100	277.100	ug/l	6.71	1800.00	1267058.00		A
111 Cd	244.600	244.600	ug/l	6.10	4500.00	296017.09		P
114 Cd	241.400	241.400	ug/l	5.67	4500.00	676052.81		P
118 Sn	573.000	573.000	ug/l	6.33	4500.00	1739795.00		A
121 Sb	518.200	518.200	ug/l	6.35	4500.00	2338437.00		A
123 Sb	517.600	517.600	ug/l	4.67	4500.00	1827295.00		A
135 Ba	5,644.000	5644.000	ug/l	9.05	4500.00	6175052.00		A
137 Ba	5,760.000	5760.000	ug/l	4.08	4500.00	11121860.00		A
139 La	530.900	530.900	ug/l	6.14	4500.00	9742764.00		A
140 Ce	558.500	558.500	ug/l	3.91	4500.00	9927414.00		A
199 Hg	0.071	0.071	ug/l	8.76	450.00	165.33		P
200 Hg	0.104	0.104	ug/l	6.80	450.00	258.67		P
202 Hg	0.084	0.084	ug/l	4.72	450.00	291.33		P
203 Tl	517.600	517.600	ug/l	2.92	4500.00	3365939.00		A
205 Tl	525.400	525.400	ug/l	3.21	4500.00	8185022.00		A
206 Pb	554.600	554.600	ug/l	3.88	4500.00	2873634.00		A
207 Pb	552.100	552.100	ug/l	2.59	4500.00	2635333.00		A
208 Pb	547.900	547.900	ug/l	2.57	4500.00	11770550.00		A
232 Th	584.400	584.400	ug/l	1.85	4500.00	14823650.00		A
238 U	553.400	553.400	ug/l	2.28	4500.00	15480470.00		A

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	757005.88	2.30	609356.69	124.2	60.000002	-	125
72 Ge	929331.63	4.66	849473.38	109.4	60.000002	-	125
89 Y	1638127.50	4.93	1346571.10	121.7	60.000002	-	125
115 In	1771757.40	1.84	1630928.10	108.6	60.000002	-	125
209 Bi	5287437.50	4.52	5261894.50	100.5	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01087

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\056SMPL.D\056SMPL.D#
Date Acquired: Feb 14 2018 02:34 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.382	0.382	ug/l	25.57	4500.00	625.56		P
11 B	6.797	6.797	ug/l	12.33	4500.00	7162.22		P
27 Al	35.150	35.150	ug/l	16.32	4500.00	92973.33		P
47 Ti	1.448	1.448	ug/l	24.81	4500.00	653.33		P
51 V	0.930	0.930	ug/l	22.28	4500.00	5806.38		P
52 Cr	0.995	0.995	ug/l	10.10	4500.00	7823.33		P
53 Cr	1.353	1.353	ug/l	16.96	4500.00	960.00		P
55 Mn	5.215	5.215	ug/l	14.87	4500.00	32156.67		P
57 Fe	31.820	31.820	ug/l	26.76	4500.00	11310.00		P
59 Co	0.981	0.981	ug/l	19.19	4500.00	6400.00		P
60 Ni	0.897	0.897	ug/l	12.51	4500.00	1346.67		P
62 Ni	0.802	0.802	ug/l	60.13	4500.00	353.33		P
63 Cu	0.939	0.939	ug/l	23.61	4500.00	3526.67		P
65 Cu	0.919	0.919	ug/l	17.43	4500.00	1630.00		P
66 Zn	0.682	0.682	ug/l	28.19	4500.00	1102.55		P
75 As	1.083	1.083	ug/l	24.06	4500.00	1444.90		P
77 Se	1.851	1.851	ug/l	4.19	4500.00	194.00		P
79 Br	0.065	0.065	ug/l	---	#VALUE!	256.67		P
82 Se	0.960	0.960	ug/l	39.19	4500.00	116.80		P
88 Sr	0.969	0.969	ug/l	17.48	4500.00	9736.67		P
95 Mo	1.346	1.346	ug/l	27.44	4500.00	2723.33		P
97 Mo	1.408	1.408	ug/l	11.61	4500.00	1813.33		P
98 Mo	1.337	1.337	ug/l	10.55	4500.00	4548.47		P
107 Ag	0.490	0.490	ug/l	20.71	1800.00	3177.78		P
109 Ag	0.482	0.482	ug/l	20.14	1800.00	3044.44		P
111 Cd	0.402	0.402	ug/l	26.58	4500.00	1384.42		P
114 Cd	0.399	0.399	ug/l	25.25	4500.00	1519.62		P
118 Sn	1.121	1.121	ug/l	9.62	4500.00	4520.00		P
121 Sb	1.080	1.080	ug/l	12.32	4500.00	6224.67		P
123 Sb	1.088	1.088	ug/l	11.73	4500.00	4911.33		P
135 Ba	10.980	10.980	ug/l	16.94	4500.00	13573.33		P
137 Ba	10.600	10.600	ug/l	16.61	4500.00	23146.67		P
139 La	1.047	1.047	ug/l	14.51	4500.00	21516.67		P
140 Ce	1.040	1.040	ug/l	14.46	4500.00	20730.00		P
199 Hg	-0.010	-0.010	ug/l	38.35	450.00	78.33		P
200 Hg	-0.005	-0.005	ug/l	28.93	450.00	91.00		P
202 Hg	-0.012	-0.012	ug/l	26.72	450.00	104.67		P
203 Tl	1.319	1.319	ug/l	2.63	4500.00	10606.67		P
205 Tl	1.348	1.348	ug/l	4.50	4500.00	25923.33		P
206 Pb	1.620	1.620	ug/l	6.82	4500.00	10396.67		P
207 Pb	1.638	1.638	ug/l	8.82	4500.00	9673.33		P
208 Pb	1.625	1.625	ug/l	6.92	4500.00	42823.33		P
232 Th	1.178	1.178	ug/l	11.89	4500.00	40036.66		P
238 U	0.886	0.886	ug/l	11.23	4500.00	32836.67		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)		Flag
45 Sc	798577.81	1.30	609356.69	131.1	60.000002	-	125	ISFail
72 Ge	1065824.50	0.91	849473.38	125.5	60.000002	-	125	ISFail
89 Y	1682500.80	2.52	1346571.10	124.9	60.000002	-	125	
115 In	1982311.80	1.87	1630928.10	121.5	60.000002	-	125	
209 Bi	6002923.00	1.72	5261894.50	114.1	60.000002	-	125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
2 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Fail

ED_004985_00011411-01088

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\057SMPL.D\057SMPL.D#
Date Acquired: Feb 14 2018 02:36 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	0.142	0.142	ug/l	36.92	4500.00	340.00		P
11 B	3.285	3.285	ug/l	3.27	4500.00	4480.00		P
27 Al	16.460	16.460	ug/l	8.74	4500.00	41406.66		P
47 Ti	0.732	0.732	ug/l	41.16	4500.00	356.67		P
51 V	0.455	0.455	ug/l	12.49	4500.00	3034.52		P
52 Cr	0.577	0.577	ug/l	5.63	4500.00	5350.00		P
53 Cr	0.701	0.701	ug/l	39.04	4500.00	556.67		P
55 Mn	2.743	2.743	ug/l	11.00	4500.00	15806.67		P
57 Fe	22.630	22.630	ug/l	9.04	4500.00	9076.67		P
59 Co	0.496	0.496	ug/l	7.27	4500.00	3413.33		P
60 Ni	0.430	0.430	ug/l	11.52	4500.00	703.33		P
62 Ni	0.241	0.241	ug/l	66.24	4500.00	226.67		P
63 Cu	0.391	0.391	ug/l	14.19	4500.00	1710.00		P
65 Cu	0.446	0.446	ug/l	7.32	4500.00	856.67		P
66 Zn	0.246	0.246	ug/l	6.20	4500.00	614.34		P
75 As	0.563	0.563	ug/l	10.11	4500.00	801.17		P
77 Se	0.588	0.588	ug/l	45.43	4500.00	96.33		P
79 Br	0.035	0.035	ug/l	---	#VALUE!	226.67		P
82 Se	0.438	0.438	ug/l	17.90	4500.00	62.13		P
88 Sr	0.464	0.464	ug/l	8.78	4500.00	4623.33		P
95 Mo	0.612	0.612	ug/l	0.75	4500.00	1293.33		P
97 Mo	0.508	0.508	ug/l	19.53	4500.00	736.67		P
98 Mo	0.491	0.491	ug/l	12.65	4500.00	1885.13		P
107 Ag	0.177	0.177	ug/l	5.67	1800.00	1370.00		P
109 Ag	0.178	0.178	ug/l	30.93	1800.00	1338.89		P
111 Cd	0.158	0.158	ug/l	48.11	4500.00	952.16		P
114 Cd	0.177	0.177	ug/l	24.96	4500.00	740.69		P
118 Sn	0.465	0.465	ug/l	6.17	4500.00	2063.33		P
121 Sb	0.440	0.440	ug/l	9.88	4500.00	2699.33		P
123 Sb	0.450	0.450	ug/l	11.47	4500.00	2156.00		P
135 Ba	5.592	5.592	ug/l	9.13	4500.00	6293.33		P
137 Ba	5.764	5.764	ug/l	10.87	4500.00	11440.00		P
139 La	0.525	0.525	ug/l	10.93	4500.00	9716.67		P
140 Ce	0.524	0.524	ug/l	7.18	4500.00	9440.00		P
199 Hg	-0.016	-0.016	ug/l	32.48	450.00	63.00		P
200 Hg	-0.012	-0.012	ug/l	37.18	450.00	68.00		P
202 Hg	-0.018	-0.018	ug/l	42.69	450.00	80.33		P
203 Tl	1.283	1.283	ug/l	4.73	4500.00	9236.67		P
205 Tl	1.295	1.295	ug/l	5.19	4500.00	22330.00		P
206 Pb	0.796	0.796	ug/l	6.64	4500.00	4950.00		P
207 Pb	0.821	0.821	ug/l	4.21	4500.00	4676.67		P
208 Pb	0.815	0.815	ug/l	4.50	4500.00	20550.00		P
232 Th	0.475	0.475	ug/l	7.28	4500.00	17612.22		P
238 U	0.375	0.375	ug/l	6.98	4500.00	14820.00		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)		Flag
45 Sc	726666.63	1.43	609356.69	119.3	60.000002	-	125
72 Ge	956503.56	0.76	849473.38	112.6	60.000002	-	125
89 Y	1519702.80	2.37	1346571.10	112.9	60.000002	-	125
115 In	1787326.40	3.12	1630928.10	109.6	60.000002	-	125
209 Bi	5361035.50	2.07	5261894.50	101.9	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01089

CCV QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\058CCV.D\058CCV.D#
Date Acquired: Feb 14 2018 02:39 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: CCV
Misc Info: ICPMS-200.8-W-D
Vial Number: 3
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: CCV
Dilution Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	Expected	QC Range 1 (%)	QC Range 2 (%)	Flag
9 Be	51.390	ug/l	2.56	50.00	85 - 115	90 - 110	
11 B	48.990	ug/l	0.87	50.00	85 - 115	90 - 110	
27 Al	59.300	ug/l	4.25	50.00	85 - 115	90 - 110	>15%
47 Ti	53.540	ug/l	6.78	50.00	85 - 115	90 - 110	
51 V	52.570	ug/l	4.69	50.00	85 - 115	90 - 110	
52 Cr	52.390	ug/l	4.44	50.00	85 - 115	90 - 110	
53 Cr	52.320	ug/l	5.45	50.00	85 - 115	90 - 110	
55 Mn	53.990	ug/l	4.26	50.00	85 - 115	90 - 110	
57 Fe	1352.000	ug/l	4.77	1300.00	85 - 115	90 - 110	
59 Co	51.480	ug/l	4.11	50.00	85 - 115	90 - 110	
60 Ni	51.760	ug/l	4.96	50.00	85 - 115	90 - 110	
62 Ni	53.730	ug/l	6.92	50.00	85 - 115	90 - 110	
63 Cu	51.510	ug/l	3.88	50.00	85 - 115	90 - 110	
65 Cu	51.540	ug/l	5.77	50.00	85 - 115	90 - 110	
66 Zn	51.520	ug/l	3.49	50.00	85 - 115	90 - 110	
75 As	50.590	ug/l	4.05	50.00	85 - 115	90 - 110	
77 Se	51.340	ug/l	4.83	50.00	85 - 115	90 - 110	
79 Br	1.307	ug/l	0.72	---	#### - ####	#### - ####	
82 Se	51.710	ug/l	3.01	50.00	85 - 115	90 - 110	
88 Sr	50.560	ug/l	4.18	50.00	85 - 115	90 - 110	
95 Mo	52.170	ug/l	3.53	50.00	85 - 115	90 - 110	
97 Mo	52.990	ug/l	3.79	50.00	85 - 115	90 - 110	
98 Mo	52.330	ug/l	3.61	50.00	85 - 115	90 - 110	
107 Ag	19.500	ug/l	0.95	20.00	85 - 115	90 - 110	
109 Ag	19.570	ug/l	1.34	20.00	85 - 115	90 - 110	
111 Cd	50.720	ug/l	3.50	50.00	85 - 115	90 - 110	
114 Cd	50.650	ug/l	3.25	50.00	85 - 115	90 - 110	
118 Sn	49.700	ug/l	4.49	50.00	85 - 115	90 - 110	
121 Sb	49.610	ug/l	4.57	50.00	85 - 115	90 - 110	
123 Sb	49.780	ug/l	3.67	50.00	85 - 115	90 - 110	
135 Ba	52.830	ug/l	3.07	50.00	85 - 115	90 - 110	
137 Ba	52.900	ug/l	4.85	50.00	85 - 115	90 - 110	
139 La	50.230	ug/l	4.02	50.00	85 - 115	90 - 110	
140 Ce	50.410	ug/l	3.44	50.00	85 - 115	90 - 110	
199 Hg	1.038	ug/l	3.73	1.00	85 - 115	90 - 110	
200 Hg	0.993	ug/l	4.49	1.00	85 - 115	90 - 110	
202 Hg	1.036	ug/l	6.03	1.00	85 - 115	90 - 110	
203 Tl	51.110	ug/l	4.42	50.00	85 - 115	90 - 110	
205 Tl	51.690	ug/l	3.88	50.00	85 - 115	90 - 110	
206 Pb	50.800	ug/l	4.26	50.00	85 - 115	90 - 110	
207 Pb	50.320	ug/l	4.71	50.00	85 - 115	90 - 110	
208 Pb	50.460	ug/l	4.00	50.00	85 - 115	90 - 110	
232 Th	44.740	ug/l	2.11	50.00	85 - 115	90 - 110	>10%
238 U	49.020	ug/l	2.68	50.00	85 - 115	90 - 110	

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	704326.63	0.64	609356.69	115.6	60 - 125	
72 Ge	926480.00	2.35	849473.38	109.1	60 - 125	
89 Y	1477658.90	0.54	1346571.10	109.7	60 - 125	
115 In	1667318.00	1.78	1630928.10	102.2	60 - 125	
209 Bi	5026301.00	2.13	5261894.50	95.5	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

QC Range 1
1 :Element Failures 10 :Max. Number of Failures Allowed
QC Range 2
2 :Element Failures 8 :Max. Number of Failures Allowed

0 :ISTD Failures 1 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01090

Sample QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\059SMPL.D\059SMPL.D#
Date Acquired: Feb 14 2018 02:42 pm
Acq. Method: 208CLdsa.M
Operator: JPV
Sample Name: Rinse
Misc Info: ICPMS-200.8-W-D
Vial Number: 1
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal. Update: Feb 14 2018 12:30 pm
Sample Type: Sample
Dilution Factor: 1.00
Autodil Factor: Undiluted
Final Dil Factor: 1.00

QC Elements

Element	Corr Conc	Raw Conc	Units	RSD(%)	High Limit	Counts	Flag	DMode
9 Be	-0.002	-0.002	ug/l	812.15	4500.00	192.22		P
11 B	-1.673	-1.673	ug/l	9.69	4500.00	1525.56		P
27 Al	5.632	5.632	ug/l	3.47	4500.00	15523.33		P
47 Ti	0.281	0.281	ug/l	51.10	4500.00	203.33		P
51 V	0.133	0.133	ug/l	20.12	4500.00	1494.74		P
52 Cr	0.195	0.195	ug/l	22.20	4500.00	3676.67		P
53 Cr	0.205	0.205	ug/l	29.67	4500.00	313.33		P
55 Mn	1.078	1.078	ug/l	0.85	4500.00	6750.00		P
57 Fe	11.660	11.660	ug/l	28.23	4500.00	7500.00		P
59 Co	0.165	0.165	ug/l	7.41	4500.00	1750.00		P
60 Ni	0.133	0.133	ug/l	59.77	4500.00	366.67		P
62 Ni	-0.238	-0.238	ug/l	114.69	4500.00	143.33		P
63 Cu	0.095	0.095	ug/l	23.92	4500.00	886.67		P
65 Cu	0.118	0.118	ug/l	45.39	4500.00	420.00		P
66 Zn	-0.062	-0.062	ug/l	71.53	4500.00	335.92		P
75 As	0.221	0.221	ug/l	31.72	4500.00	458.23		P
77 Se	0.220	0.220	ug/l	134.50	4500.00	70.67		P
79 Br	-0.025	-0.025	ug/l	---	#VALUE!	210.00		P
82 Se	0.238	0.238	ug/l	15.34	4500.00	44.00		P
88 Sr	0.122	0.122	ug/l	18.34	4500.00	1770.00		P
95 Mo	0.629	0.629	ug/l	13.87	4500.00	1253.33		P
97 Mo	0.470	0.470	ug/l	24.13	4500.00	663.33		P
98 Mo	0.528	0.528	ug/l	10.33	4500.00	1881.31		P
107 Ag	0.143	0.143	ug/l	17.76	1800.00	1142.22		P
109 Ag	0.159	0.159	ug/l	42.29	1800.00	1185.56		P
111 Cd	0.062	0.062	ug/l	33.63	4500.00	791.72		P
114 Cd	0.024	0.024	ug/l	55.58	4500.00	294.26		P
118 Sn	0.892	0.892	ug/l	7.15	4500.00	3193.33		P
121 Sb	0.287	0.287	ug/l	0.67	4500.00	1904.33		P
123 Sb	0.298	0.298	ug/l	1.94	4500.00	1533.00		P
135 Ba	2.117	2.117	ug/l	15.53	4500.00	2330.00		P
137 Ba	2.114	2.114	ug/l	7.24	4500.00	4123.33		P
139 La	0.236	0.236	ug/l	4.87	4500.00	4153.33		P
140 Ce	0.242	0.242	ug/l	9.86	4500.00	4153.33		P
199 Hg	-0.003	-0.003	ug/l	178.58	450.00	74.00		P
200 Hg	0.006	0.006	ug/l	22.57	450.00	93.33		P
202 Hg	-0.009	-0.009	ug/l	49.88	450.00	94.00		P
203 Tl	1.329	1.329	ug/l	5.38	4500.00	8980.00		P
205 Tl	1.357	1.357	ug/l	0.99	4500.00	21936.67		P
206 Pb	0.360	0.360	ug/l	9.38	4500.00	2510.00		P
207 Pb	0.363	0.363	ug/l	1.67	4500.00	2320.00		P
208 Pb	0.378	0.378	ug/l	4.90	4500.00	10390.00		P
232 Th	0.575	0.575	ug/l	6.09	4500.00	19044.44		P
238 U	0.138	0.138	ug/l	4.64	4500.00	7623.33		P

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)		QC Range(%)	Flag
45 Sc	690333.38	1.31	609356.69	113.3	60.000002	-	125
72 Ge	920883.38	1.53	849473.38	108.4	60.000002	-	125
89 Y	1467449.30	1.17	1346571.10	109.0	60.000002	-	125
115 In	1693395.00	2.55	1630928.10	103.8	60.000002	-	125
209 Bi	5050086.00	1.82	5261894.50	96.0	60.000002	-	125

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

0 :Element Failures 0 :Max. Number of Failures Allowed
0 :ISTD Failures 0 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

ED_004985_00011411-01091

CCB QC Report ICPMS202-B

Data File: C:\ICPCHEM\1\DATA\18B14m00.B\060_CCB.D\060_CCB.D#
Date Acquired: Feb 14 2018 02:45 pm
Operator: JPV
Sample Name: CCB
Misc Info: ICPMS-200.8-W-D
Vial Number: 2
Current Method: C:\ICPCHEM\1\METHODS\208CLdsa.M
Calibration File: C:\ICPCHEM\1\DATA\16A04J00.B\208CLdsa.C
Last Cal Update: Feb 14 2018 12:30 pm
Sample Type: CCB
Total Dil Factor: 1.00

QC Elements

Element	Conc.	Units	RSD(%)	High Limit	Flag
9 Be	-0.029	ug/l	117.61	0.09	
11 B	-2.406	ug/l	3.39	1.18	
27 Al	3.728	ug/l	3.33	0.38	Fail
47 Ti	0.211	ug/l	137.46	0.17	Fail
51 V	0.080	ug/l	50.55	0.09	
52 Cr	0.170	ug/l	33.19	0.12	Fail
53 Cr	0.171	ug/l	32.06	0.13	Fail
55 Mn	0.753	ug/l	9.49	0.14	Fail
57 Fe	7.978	ug/l	59.00	4.00	Fail
59 Co	0.111	ug/l	18.89	0.04	Fail
60 Ni	-0.026	ug/l	71.99	0.08	
62 Ni	0.094	ug/l	257.67	0.32	
63 Cu	0.092	ug/l	7.45	0.09	
65 Cu	0.091	ug/l	56.47	0.22	
66 Zn	-0.096	ug/l	57.52	0.10	
75 As	0.109	ug/l	15.40	0.12	
77 Se	0.100	ug/l	124.19	1.22	
79 Br	-0.109	ug/l	113.53	#VALUE!	
82 Se	-0.022	ug/l	297.34	0.32	
88 Sr	0.065	ug/l	44.83	0.05	Fail
95 Mo	0.247	ug/l	41.71	0.05	Fail
97 Mo	0.170	ug/l	91.36	0.03	Fail
98 Mo	0.175	ug/l	18.05	0.03	Fail
107 Ag	0.069	ug/l	26.57	0.09	
109 Ag	0.066	ug/l	48.61	0.10	
111 Cd	-0.009	ug/l	649.33	0.03	
114 Cd	-0.007	ug/l	308.83	0.03	
118 Sn	0.304	ug/l	24.41	0.05	Fail
121 Sb	0.123	ug/l	3.25	0.03	Fail
123 Sb	0.130	ug/l	6.49	0.04	Fail
135 Ba	1.466	ug/l	15.80	0.09	Fail
137 Ba	1.285	ug/l	8.58	0.08	Fail
139 La	0.164	ug/l	6.60	0.02	Fail
140 Ce	0.159	ug/l	10.45	0.02	Fail
199 Hg	-0.009	ug/l	58.19	0.03	
200 Hg	-0.010	ug/l	15.89	0.03	
202 Hg	-0.009	ug/l	70.40	0.03	
203 Tl	1.203	ug/l	5.87	0.03	Fail
205 Tl	1.214	ug/l	2.29	0.02	Fail
206 Pb	0.263	ug/l	10.58	#VALUE!	
207 Pb	0.263	ug/l	2.93	#VALUE!	
208 Pb	0.270	ug/l	6.08	0.02	Fail
232 Th	0.257	ug/l	12.59	0.06	Fail
238 U	0.046	ug/l	8.65	0.02	Fail

ISTD Elements

Element	CPS Mean	RSD(%)	Ref Value	Rec(%)	QC Range(%)	Flag
45 Sc	672760.00	0.72	609356.69	110.4	60 - 125	
72 Ge	896056.63	0.99	849473.38	105.5	60 - 125	
89 Y	1435050.50	0.76	1346571.10	106.6	60 - 125	
115 In	1643434.90	2.19	1630928.10	100.8	60 - 125	
209 Bi	4883406.00	0.77	5261894.50	92.8	60 - 125	

ISTD Ref File : C:\ICPCHEM\1\DATA\18B14m00.B\003CALB.D\003CALB.D#

23 :Element Failures 30 :Max. Number of Failures Allowed
0 :ISTD Failures 2 :Max. Number of ISTD Failures Allowed

Data Results:
Analytes: Pass
ISTD: Pass

Work Order Receipt Checklist

Homestake Mining Co

C18010792

Login completed by: Dorian Quis
Date Received: 1/30/2018
Reviewed by: Kasey Vidick
Received by: kak
Reviewed Date: 2/1/2018
Carrier name: NDA

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	6.2°C On Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

ED_004985_00011411-01094

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Page 1 of 1

Account Information (Billing information)

Company/Name	Homestake Mining Company
Contact	~~Billy Arrieta~~ Tom Wohlford
Phone	~~505.290.3706~~ 505.290.2187
Mailing Address	PO Box 98
City, State, Zip	Grants, NM 87020
Email	twohlford@barrick.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	5105
Bottle Order	54217

Report Information (if different than Account Information)

Company/Name	Arcadis/Shannon Ulrich
Contact	Shannon Ulrich
Phone	865.771.2397
Mailing Address	630 Plaza Drive Ste 100
City, State, Zip	Highlands Ranch, CO 80129
Email	shannon.ulrich@arcadis.com
Receive Report	☐Hard Copy ☒Email
Special Report/Formats:	excel/EQuIS
☒LEVEL IV ☐NELAC ☒EDD/EDT (contact laboratory) ☐Other	

Comments

Contact Tracey Archer upon receipt.

Hold DCM Labs samples until Arcadis approves transfer

Project Information

Project Name, PWSID, Permit, etc.	Grants Reclamation Project
Sampler Name	Shannon Ulrich
Sampler Phone	865.771.2397
Sample Origin State	NM
EPA/State Compliance	☐Yes ☒No

URANIUM MINING CLIENTS MUST indicate sample type. Background location
☐ Unprocessed Ore
☐ Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11(e)2 Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes

A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.

Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	SPLP variation: Mo, Se, U, V	Total metals: Al, Ca, Fe, Mo, P, K, Se, Na, U, V	Sample for DCM labs (please hold)	See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	DD-BK-15-16-012518	1-25-18	1605	~~3~~ SMU	S	X	X	X			
2	DD-BK-50-51-012518	1-25-18	1710	~~3~~ SMU	S	X	X	X SMU			C18010792
3											
4											
5											
6											
7											
8											
9											
10											

SMU

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Shannon Ulrich	1/29/18 / 1530		UPS		
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time 1/31/18 6:31	Signature

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check	Amount $	Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-11/17 v.2

ED_004985_00011411-01095

ENERGY LAB Trust our People. Trust our Data. www.energylab.com

Billings, MT 800.735.4489 • Casper, WY 888.235.0515 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

BOTTLE ORDER 54217

SHIPPED TO: Homestake Mining Co

Contact: Shannon Ulrich or Shawn Roberts
Hwy 605

Grants NM 87020

Phone: 5052874456

Project: SPLP and Total Metals

Order Created by: Tracey Archer
Shipped From: Casper, WY

Ship Date: 1/12/2018
VIA: Ground
Quote Used: 5105

Bottle Size/Type	Bottles Per Samp	Method	Tests	Critical Hold Time	Preservative	Notes	Num of Samp
SPLP Variation (22 Sets)							
1 Liter Clear Glass Wide Mouth	1	E6010.20	Metals by ICP/ICPMS, SPLP				1
SPLP Variation/Level 4 (2 Sets)							
1 Liter Clear Glass Wide Mouth	1	E6010.20	Metals by ICP/ICPMS, SPLP				1
Total Metals (22 Sets)							
8 oz. Clear Glass, Wide-Mouth	1	E6010.20	Metals by ICP/ICPMS, Total				1

4 coolers coming with a total of 20 sample sets.

Please contact Tracey Archer upon receipt of coolers.

Thanks!

ED_004985_00011411-01096

Total Metals/Level 4 (2 Sets)						
8 oz. Clear Glass, Wide-Mouth	1	E6010.20	Metals by ICP/ICPMS, Total			1

Comments

Please include:
- 2L-water for a field blank
- 2L -water for an equipment blank
- COCs
- custody seals
- temperature blanks
- UPS overnight labels
- One extra set of: UPS overnight label, COC, custody seal, temperature blank.

■ HNO3 - Nitric Acid	☐ H2SO4 - Sulfuric Acid	■ NaOH - Sodium Hydroxide	**We strongly suggest that the samples are shipped the same day as they are collected.**
■ ZnAc - Zinc Acetate	■ HCl - Hydrochloric Acid	☐ H3PO4 - Phosphoric Acid	

Material Safety Data Sheets(MSDS) Available @ EnergyLab.com ->Services -> MSDS Sheets

Corrosive Chemicals: Nitric, Sulfuric, Phosphoric, Hydrochloric Acids and Sodium Hydroxide. Zinc Acetate is a skin irritant.

Subcontracting of sample analyses to an outside laboratory may be required. If so, Energy Laboratories will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

February 22, 2018

Report to:
Shannon Ulrich
ARCADIS
630 Plaza Drive
Suite 100
Highlands Ranch, CO 80129

cc: Anna Hagemeister

Bill to:
Accounts Payable
ARCADIS
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129

Project ID: AO000120.1702.00002
ACZ Project ID: L42514

Shannon Ulrich:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 06, 2018. This project has been assigned to ACZ's project number, L42514. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L42514. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after August 21, 2018. If the samples are determined to be hazardous, additional charges apply for disposal (typically $11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.

Sue Webber has reviewed and approved this report.

ED_004985_00011411-01097

ARCADIS
Project ID: AO000120.1702.00002
Sample ID: DD2-BK-25-26-012218

ACZ Sample ID: ***L42514-01***
Date Sampled: *01/22/18 15:20*
Date Received: *02/06/18*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Texture by Hydrometer	ASA No. 9 Pt. 1 Section 15-5									
Clay		1	7.5		*	%	0.1	0.5	02/19/18 0:00	ajm
Sand		1	92.5		*	%	0.1	0.5	02/19/18 0:00	ajm
Silt		1		U	*	%	0.1	0.5	02/19/18 0:00	ajm
Texture Classification		1	Sand		*				02/19/18 0:00	ajm

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								02/07/18 7:45	dbt
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								02/08/18 10:23	dbt/klg

ARCADIS
Project ID: AO000120.1702.00002
Sample ID: DD2-BK-11-12-012218

ACZ Sample ID: ***L42514-02***
Date Sampled: *01/22/18 15:09*
Date Received: *02/06/18*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Texture by Hydrometer	ASA No. 9 Pt. 1 Section 15-5									
Clay		1	62.5		*	%	0.1	0.5	02/19/18 0:00	ajm
Sand		1	7.5		*	%	0.1	0.5	02/19/18 0:00	ajm
Silt		1	30.0		*	%	0.1	0.5	02/19/18 0:00	ajm
Texture Classification		1	Clay		*				02/19/18 0:00	ajm

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								02/07/18 7:46	dbt
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								02/08/18 10:29	dbt/klg

ARCADIS
Project ID: AO000120.1702.00002
Sample ID: DD2-BK-71-72-D12318

ACZ Sample ID: ***L42514-03***
Date Sampled: *01/23/18 13:30*
Date Received: *02/06/18*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Texture by Hydrometer	ASA No. 9 Pt. 1 Section 15-5									
Clay		1	7.5		*	%	0.1	0.5	02/20/18 0:00	ajm
Sand		1	92.5		*	%	0.1	0.5	02/20/18 0:00	ajm
Silt		1		U	*	%	0.1	0.5	02/20/18 0:00	ajm
Texture Classification		1	Sand		*				02/20/18 0:00	ajm

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								02/07/18 7:48	dbt
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								02/08/18 10:35	dbt/klg

ARCADIS
Project ID: AO000120.1702.00002
Sample ID: DD-BK-9-10-012518

ACZ Sample ID: ***L42514-04***
Date Sampled: *01/25/18 15:50*
Date Received: *02/06/18*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Texture by Hydrometer	ASA No. 9 Pt. 1 Section 15-5									
Clay		1	45.0		*	%	0.1	0.5	02/20/18 0:00	ajm
Sand		1	22.5		*	%	0.1	0.5	02/20/18 0:00	ajm
Silt		1	32.5		*	%	0.1	0.5	02/20/18 0:00	ajm
Texture Classification		1	Clay		*				02/20/18 0:00	ajm

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								02/07/18 7:50	dbt
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								02/08/18 10:40	dbt/klg

ARCADIS
Project ID: AO000120.1702.00002
Sample ID: DD-BK-15-16-012518

ACZ Sample ID: ***L42514-05***
Date Sampled: *01/25/18 16:05*
Date Received: *02/06/18*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Texture by Hydrometer	ASA No. 9 Pt. 1 Section 15-5									
Clay		1	10.0	*		%	0.1	0.5	02/20/18 0:00	ajm
Sand		1	87.5	*		%	0.1	0.5	02/20/18 0:00	ajm
Silt		1	2.5	*		%	0.1	0.5	02/20/18 0:00	ajm
Texture Classification		1	Loamy Sand	*					02/20/18 0:00	ajm

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								02/07/18 7:52	dbt
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								02/08/18 10:46	dbt/klg

ARCADIS
Project ID: AO000120.1702.00002
Sample ID: DD-BK-30-31-012518

ACZ Sample ID: ***L42514-06***
Date Sampled: *01/25/18 16:20*
Date Received: *02/06/18*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Texture by Hydrometer	ASA No. 9 Pt. 1 Section 15-5									
Clay		1	10.0		*	%	0.1	0.5	02/20/18 0:00	ajm
Sand		1	80.0		*	%	0.1	0.5	02/20/18 0:00	ajm
Silt		1	10.0		*	%	0.1	0.5	02/20/18 0:00	ajm
Texture Classification		1	Sandy Loam/ Loamy Sand		*				02/20/18 0:00	ajm

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								02/07/18 7:54	dbt
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								02/08/18 10:52	dbt/klg

ARCADIS
Project ID: AO000120.1702.00002
Sample ID: DD-BK-36-37-012518

ACZ Sample ID: ***L42514-07***
Date Sampled: *01/25/18 16:40*
Date Received: *02/06/18*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Texture by Hydrometer	ASA No. 9 Pt. 1 Section 15-5									
Clay		1	47.5		*	%	0.1	0.5	02/20/18 0:00	ajm
Sand		1	30.0		*	%	0.1	0.5	02/20/18 0:00	ajm
Silt		1	22.5		*	%	0.1	0.5	02/20/18 0:00	ajm
Texture Classification		1	Clay		*				02/20/18 0:00	ajm

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								02/07/18 7:56	dbt
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								02/08/18 10:58	dbt/klg

ARCADIS
Project ID: AO000120.1702.00002
Sample ID: DD-BK-50-51-012518

ACZ Sample ID: ***L42514-08***
Date Sampled: *01/25/18 17:10*
Date Received: *02/06/18*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Texture by Hydrometer	ASA No. 9 Pt. 1 Section 15-5									
Clay		1	7.5		*	%	0.1	0.5	02/20/18 0:00	ajm
Sand		1	92.5		*	%	0.1	0.5	02/20/18 0:00	ajm
Silt		1		U	*	%	0.1	0.5	02/20/18 0:00	ajm
Texture Classification		1	Sand		*				02/20/18 0:00	ajm

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								02/07/18 7:58	dbt
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								02/08/18 11:04	dbt/klg

ARCADIS
Project ID: AO000120.1702.00002
Sample ID: DD2-BK-36-37-012618

ACZ Sample ID: ***L42514-09***
Date Sampled: *01/26/18 14:50*
Date Received: *02/06/18*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Texture by Hydrometer	ASA No. 9 Pt. 1 Section 15-5									
Clay		1	7.5	*		%	0.1	0.5	02/20/18 0:00	ajm
Sand		1	87.5	*		%	0.1	0.5	02/20/18 0:00	ajm
Silt		1	5.0	*		%	0.1	0.5	02/20/18 0:00	ajm
Texture Classification		1	Loamy Sand	*					02/20/18 0:00	ajm

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Air Dry at 34 Degrees C	USDA No. 1, 1972								02/07/18 7:59	dbt
Sieve-2000 um (2.0mm)	ASA No.9, 15-4.2.2								02/08/18 11:10	dbt/klg

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Batch)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4) EPA SW-846. Test Methods for Evaluating Solid Waste.
(5) Standard Methods for the Examination of Water and Wastewater.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click: http://www.acz.com/public/extquallist.pdf

REP001.03.15.02

ARCADIS

ACZ Project ID: ***L42514***

Percent Clay ASA No. 9 Pt. 1 Section 15-5

ACZ ID	Type	Analyzed	PCN/SCN	QC Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG442122												
L42514-01DUP	DUP	02/19/18 21:31		7.5	7.5	%				0	20	

Percent Sand ASA No. 9 Pt. 1 Section 15-5

ACZ ID	Type	Analyzed	PCN/SCN	QC Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG442122												
L42514-01DUP	DUP	02/19/18 21:31		92.5	92.5	%				0	20	

Percent Silt ASA No. 9 Pt. 1 Section 15-5

ACZ ID	Type	Analyzed	PCN/SCN	QC Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG442122												
L42514-01DUP	DUP	02/19/18 21:31		U	U	%				0	20	RA

ARCADIS

ACZ Project ID: ***L42514***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L42514-01	WG442122	Silt	ASA No. 9 Pt. 1 Section 15-5	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

Soil Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Clay	ASA No. 9 Pt. 1 Section 15-5
Sand	ASA No. 9 Pt. 1 Section 15-5
Silt	ASA No. 9 Pt. 1 Section 15-5
Texture Classification	ASA No. 9 Pt. 1 Section 15-5

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

ARCADIS
AO000120.0001.00002

ACZ Project ID: L42514
Date Received: 02/06/2018 13:22
Received By:
Date Printed: 2/7/2018

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? [1]			X
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
NA27790	12.6	NA	14	N/A

Was ice present in the shipment container(s)?

No - Wet or gel ice was not present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

ARCADIS
AO000120.0001.00002

ACZ Project ID: L42514
Date Received: 02/06/2018 13:22
Received By:
Date Printed: 2/7/2018

[1] The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na2S2O3 preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

ACZ Laboratories, Inc. L42514

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: Shannon Ulrich
Company: Arcadis
E-mail: shannon.ulrich@arcadis.com
Address: 11001 West 120th Avenue, Ste. 200
Broomfield, CO 80021
Telephone: 865-771-2397

Copy of Report to:

Name: Anna Hagemeister
Company: Arcadis
E-mail: anna.hagemeister@arcadis.com
Telephone: 303-471-3926

Invoice to:

Name: Accounts Payable
Company: Arcadis
E-mail: accountspayable.administration@arca
Address: 630 Plaza Drive, Ste. 100
Highlands Ranch, CO 80129
Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [X] NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes [ ] No [X]

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Shannon Ulrich **Sampler's Site Information** **State** NM **Zip code** 87020 **Time Zone** mtn

***Sampler's Signature:** Shannon Ulrich

*I attest to the authenticity and validity of this sample. I understand that intentionally mislabeling the time/date/location or tampering with the sample in anyway, is considered fraud and punishable by State Law.

PROJECT INFORMATION

Quote #: PARTICLE-SIZE
PO#: AO000120.0001.00002
Reporting state for compliance testing:
Check box if samples include NRC licensed material? [ ]

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	Particle size analysis								
					SMU							
DD2-BK-25-26-012218	1/22/18 : 1520	SO	1	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
DD2-BK-11-12-012218	1/22/18 : 1509	SO	1	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
DD2-BK-71-72-012318	1/23/18 : 1330	SO	1	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
DD-BK-9-10-012518	1/25/18 : 1550	SO	1	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
DD-BK-15-16-012518	1/25/18 : 1605	SO	1	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
DD-BK-30-31-012518	1/25/18 : 1620	SO	1	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
DD-BK-36-37-012518	1/25/18 : 1640	SO	1	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
DD-BK-50-51-012518	1/25/18 : 1710	SO	1	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
DD2-BK-36-37-012618	1/26/18 : 1450	SO	1	[X]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
				[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	SMU

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

DD-BK-36-37-012518 is a day that has dried out

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Shannon Ulrich	1/31/18:1600	UPS	2/6/18 1352

FRMAD050.06.14.14 White - Return with sample. Yellow - Retain for your records.

L42514 Chain of Custody

ED_004985_00011411-01113

APPENDIX D

Mineralogical Data

12421 W. 49th Avenue, Unit #6
Wheat Ridge, CO 80033 (303) 463-8270

Semi-Quantitative X-Ray Diffraction Analysis

Client:
Energy Laboratories, Inc.
2393 Salt Creek Hwy
Casper, WY 82602-0247

Analysis Date:	5-15-18
Reporting Date:	5-16-18
Receipt Date:	4-3-18
Client Job No.:	None Given
Project Title:	Homestake Mining Co.
DCMSL Project:	ELAB48A

Client Sample No.:	**DD2-BK-60-61-012618**	**DD2-BK-11-12-012218**
Bulk Sample		
Quartz	28	26
K-Feldspar	6	5
Plagioclase	6	6
Calcite	3	7
Gypsum	1	-
Kaolinite	-	-
Illite/Mica	-	-
Smectite	-	-
Total Clay	56	56
Smectite	39	26
Illite	4	7
Kaolinite	13	23

The bulk samples were prepared for x-ray diffraction analysis and scanned over a range of 4° to 45 ° 2θ Cu Kα radiation, 40kV, 25mA. Mineral phases were identified with the aid of computer-assisted programs accessing a powder diffraction database. Estimates of mineral concentrations are based on relative peak heights and reference intensity ratios (RIR) measured in-house.

DCM SCIENCE LABORATORY, INC
12421 W. 49th Avenue, Unit #6
Wheat Ridge, CO 80033 (303) 463-8270

Semi-Quantitative X-Ray Diffraction Analysis

Client:
Energy Laboratories, Inc.
2393 Salt Creek Hwy
Casper, WY 82602-0247

Analysis Date: 5-15-18
Reporting Date: 5-16-18
Receipt Date: 4-3-18
Client Job No.: None Given
Project Title: Homestake Mining Co.
DCMSL Project: ELAB48A

Client Sample No.:	**DD2-BK-60-61-012618**	**DD2-BK-11-12-012218**
Clay Fraction <2µm		
Smectite	69	46
Illite	7	13
Kaolin	24	41

An oriented clay mount (<2µm) was prepared for x-ray diffraction analysis and scanned over a range of 3° to 40° 2Θ Cu Ka radiation, 40kV, 25mA. The mount was analyzed air-dried (RH ~25%) and glycolated. Clay concentrations are based on peak areas and intensity factors measured in-house on known standards or computer calculated.

Ron Schott

Ron Schott, Analyst

ED_004985_00011411-01117

Energy Laboratories, Inc.
2393 Salt Creek Hwy * PO Box 247
Casper, WY 82602-0247
307.235.0515

C18010791

CHAIN-OF-CUSTODY RECORD

Page 1 of 1
05-Apr-18

Custody Seal: Y N
Intact: Y N
Signature Match: Y N

Shipped By: _____
Receipt Temp: _____

Subcontractor:
ELI - Casper
2393 Salt Creek Hwy
Casper, WY 82602

PCM Laboratories
12421 W. 49th Ave. Unit #6
Wheat Ridge, CO 80033

TEL: (307) 235-0515 FAX:
Acct #:

Subcontractor's Client: Homestake Mining Co

					SERVICES	Requested Tests
☐	C18010791-002C	Soil	01/26/18 03:05 P	1-ZIPLOCK	1	
☐	C18010791-004C	Soil	01/25/18 03:50 P	1-ZIPLOCK	1	
☐	C18010791-006C	Soil	01/25/18 04:40 P	1-ZIPLOCK	1	
☐	C18010791-010C	Soil	01/26/18 01:30 P	1-ZIPLOCK	1	
☐	C18010791-013C	Soil	01/22/18 03:09 P	1-ZIPLOCK	1	
☐	C18010791-014C	Soil	01/22/18 03:20 P	1-ZIPLOCK	1	
☐	C18010791-015C	Soil	01/23/18 12:50 P	1-ZIPLOCK	1	
☐	C18010791-017C	Soil	01/23/18 01:30 P	1-ZIPLOCK	1	

Earliest Due Date: ~~2/21/2018~~

Comments: Please see attached email for analysis. - Tracey Archer

QC Level:
STD

	Date/Time		
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	

XRD

12337
ELAB48

ENERGY LABORATORIES
Trust our People. Trust our Data.
Billings, MT 800.735.4489 • Casper, WY 888.235.0515
Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

DCM SCIENCE LABORATORY, INC.
12421 W. 49th Avenue, Unit #6
Wheat Ridge, CO 80033 (303) 463-8270

Semi-Quantitative X-Ray Diffraction Analysis

Client:
Energy Laboratories, Inc.
2393 Salt Creek Hwy
Casper, WY 82602-0247

Analysis Date: 5-15-18
Reporting Date: 5-16-18
Receipt Date: 4-3-18
Client Job No.: None Given
Project Title: Homestake Mining Co.
DCMSL Project: ELAB48B

Client Sample No.:	**DD-BK-9-10-012518**	**DD2-BK-25-26-012218**	**DD2-BK-51-52-012318**	**DD2-BK-71-72-012318**
Phase				
Quartz	38	78	54	70
K-Feldspar	9	9	10	12
Plagioclase	7	5	12	8
Calcite	5	3	1	3
Gypsum	-	-	-	-
Kaolinite	11	-	6	1
Illite/Mica	4	3	2	3
Smectite	23	-	13	1
Hematite	-	-	1	1
Unaccounted	<5	<5	<5	<5

The samples were prepared for x-ray diffraction analysis and scanned over a range of 4° to 45° 2Θ Cu Kα radiation, 40kV, 25mA. Mineral phases were identified with the aid of computer-assisted programs accessing a powder diffraction database. Estimates of mineral concentrations are based on relative peak heights and reference intensity ratios (RIR) measured in-house.

Ron Schott

Ron Schott, Analyst

ED_004985_00011411-01119

Energy Laboratories, Inc.
2393 Salt Creek Hwy * PO Box 247
Casper, WY 82602-0247
307.235.0515

C18010791

CHAIN-OF-CUSTODY RECORD

Custody Seal: Y N
Intact: Y N
Signature Match: Y N

Shipped By: _____
Receipt Temp: _____

Subcontractor:
ELI - Casper
2393 Salt Creek Hwy
Casper, WY 82602

PCM Laboratories
12421 W. 49th Ave. Unit #6
Wheat Ridge, CO 80033

TEL: (307) 235-0515 FAX:
Acct #:

Subcontractor's Client: Homestake Mining Co

						Requested Tests
					SERVICES	
☐	C18010791-002C	Soil	01/26/18 03:05 P	1-ZIPLOCK	1	
☐	C18010791-004C	Soil	01/25/18 03:50 P	1-ZIPLOCK	1	
☐	C18010791-006C	Soil	01/25/18 04:40 P	1-ZIPLOCK	1	
☐	C18010791-010C	Soil	01/26/18 01:30 P	1-ZIPLOCK	1	
☐	C18010791-013C	Soil	01/22/18 03:09 P	1-ZIPLOCK	1	
☐	C18010791-014C	Soil	01/22/18 03:20 P	1-ZIPLOCK	1	
☐	C18010791-015C	Soil	01/23/18 12:50 P	1-ZIPLOCK	1	
☐	C18010791-017C	Soil	01/23/18 01:30 P	1-ZIPLOCK	1	

Earliest Due Date: ~~2/21/2018~~

Comments: Please see attached email for analysis. - Tracey Archer

QC Level:
STD

	Date/Time		
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	

XRD

1837
ELAB48

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Trust our People. Trust our Data.
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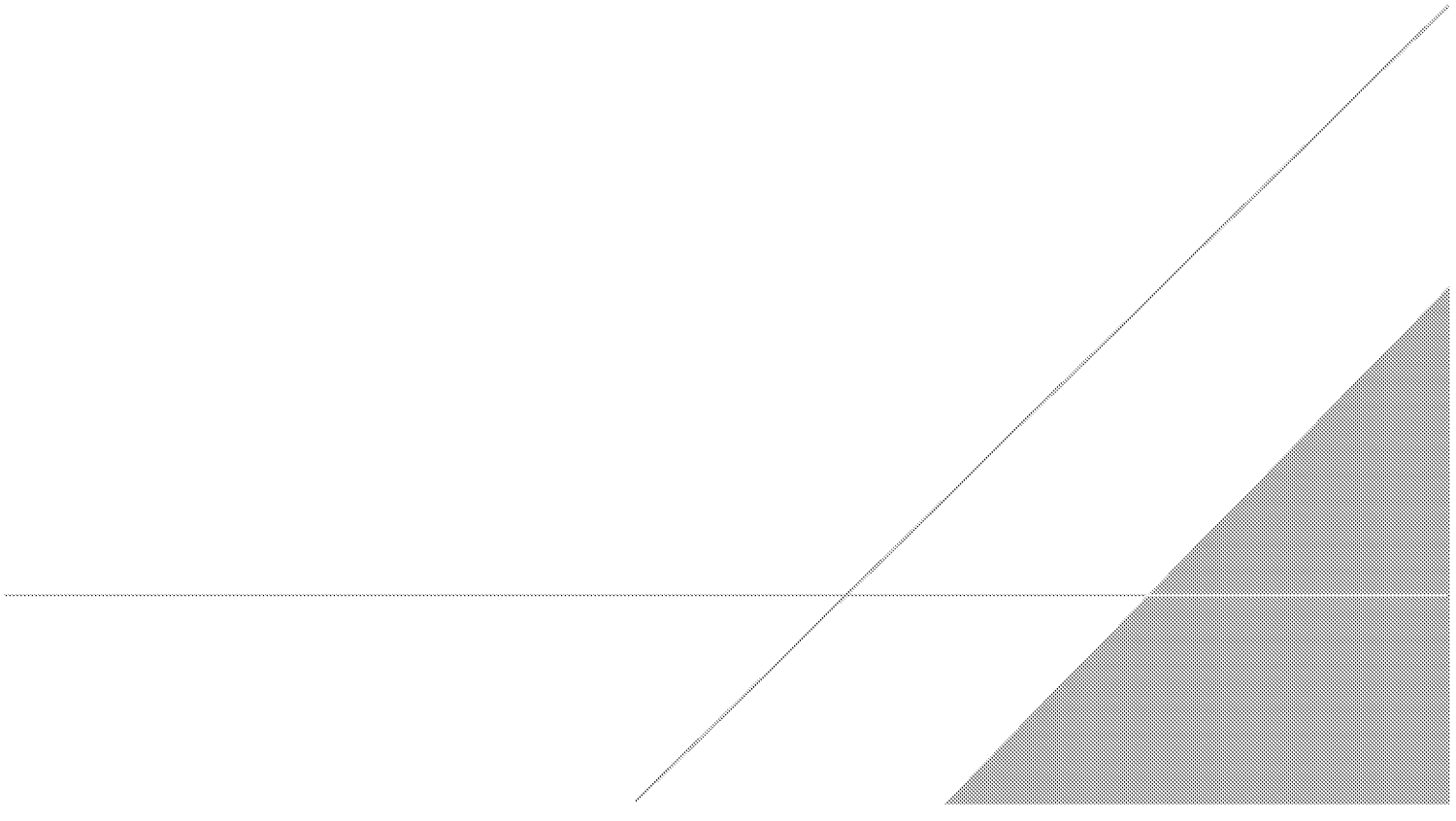
Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

APPENDIX D

Mineralogical Data



DCM
S·C·I·E·N·C·E
LABORATORY, INC.

12421 W. 49th Avenue, Unit #6
Wheat Ridge, CO 80033 - (303) 463-8270

Scanning Electron Microscopy and Petrographic Analysis

Client:
Energy Laboratories, Inc.
2393 Salt Creek Hwy
Casper, WY 82602-0247

Analysis Date:	5-15-18
Reporting Date:	5-16-18
Receipt Date:	4-6-18
Client Job No.:	None Given
Project Title:	Homestake Mining Co.
DCMSL Project:	ELAB46,47

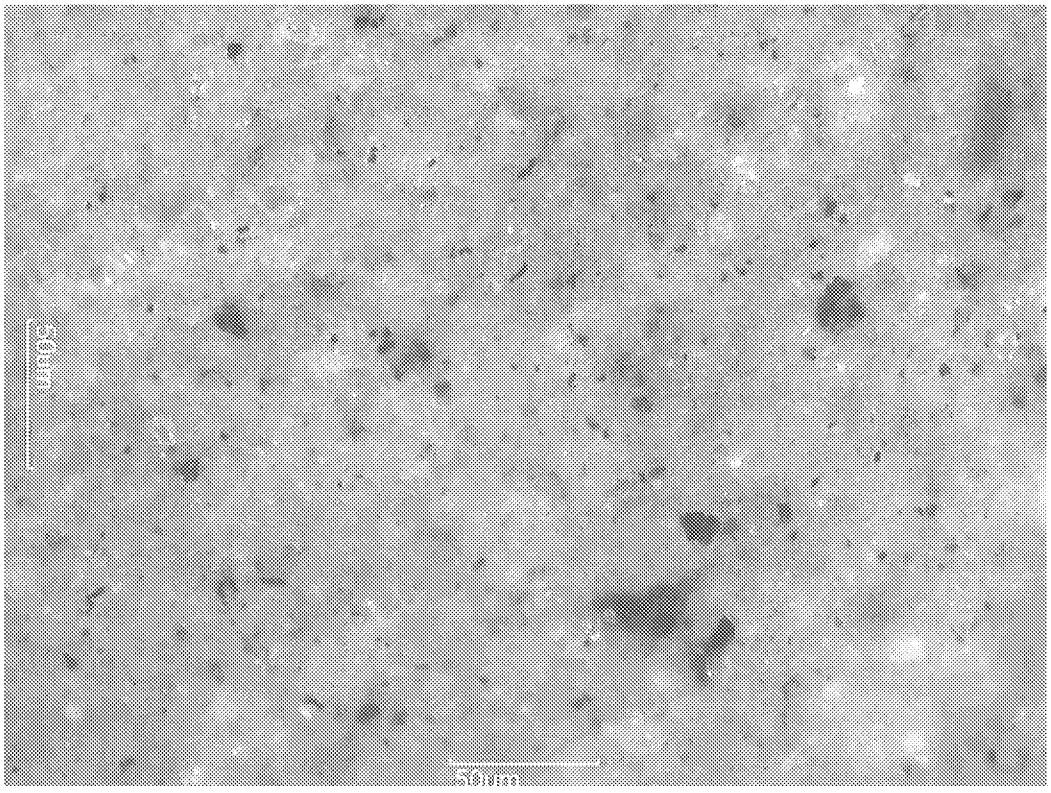
The objective of this project is to determine U associations with other mineral phases contained in eight Grants soil samples (client samples no. **DD2-BK-60-61-012618, DD-BK-9-10-012518, DD-BK-36-37-012518, DD-BK-58-59-012618, DD2-BK-11-12-012218, DD2-BK-25-26-012218, DD2-BK-51-52-012318** and **DD2-BK-71-72-012318**). Each core was prepared as a standard polished thin section or polished billet for study by field emission scanning electron microscopy (FE-SEM) equipped with an energy dispersive system (EDS). Particles of interest were identified using backscatter imaging at magnifications ranging from 500X to 40,000X, 20keV. FE-SEM images and spectra of relevant features are included for documentation. In addition, a petrographic analysis was performed on each sample using reflected/transmitted light microscopy. Color photomicrographs are included.

Client Sample No: **DD2-BK-60-61-012618**

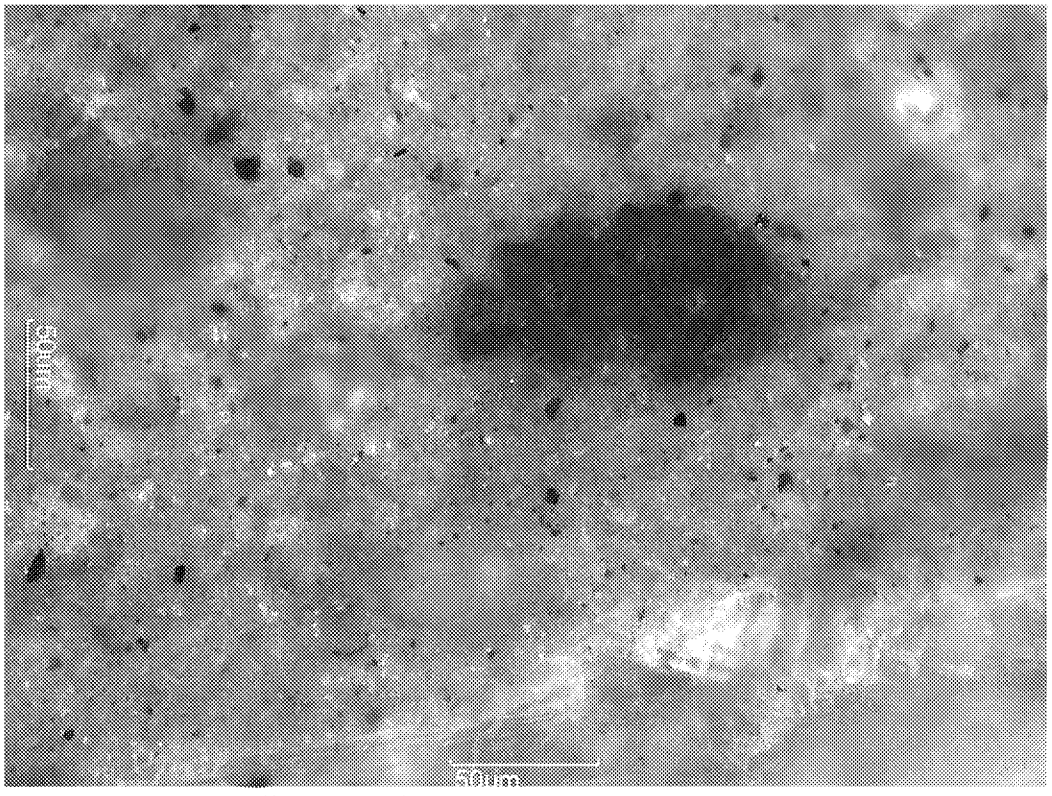
This sample is a brown sediment composed of greater than 50% clay by mass. Due to the high clay content a standard thin section could not be prepared, therefore, reflected light microscopy was done on a polished billet and transmitted light microscopy was achieved using grain mounts. The polished billet was carbon coated and used for study by FE-SEM. XRD indicates the clay is primarily swelling smectite (~39%) followed by lesser amounts of kaolinite (~13%) and illite (~4%). Approximately 40% of the sample's mass is composed of quartz and various types of feldspar. Quartz occurs as angular to well rounded grains that vary greatly in size from fine to course silt (5μm-50μm) and very fine to fine sand (65μm-250μm). Approximately 1% of the quartz is in the form of rounded, dirty looking microcrystalline chert riddled with opaque inclusions. Plagioclase and potassium feldspar is present in like amounts. Plagioclase (~6%) occurs as angular to sub-rounded grains in the silt to fine sand size. Optical studies indicate an albite to andesine composition. Potassium feldspar (~6%) is angular to sub-rounded with a similar size range as the plagioclase. Although most of the K-spar is cloudy looking orthoclase, a few clear grains of microcline are present. Other silicates include a trace of zircon, amphibole

and brown colored mica. This is the only sample gypsum (~1%) is present in. Gypsum occurs as water clear selenite that is probably secondary to the sediment. In the bulk specimen the selenite is seen as aggregates up to several millimeters in size intertwined with clay. Although not readily apparent using light microscopy, FE-SEM identified a second sulfate. Barium sulfate occurs as thin seams and small grains in clay. Some of the barite carries low values of Sr. FE-SEM also identified a cluster of halite cubes in a small clay vug. Carbonate in the form of calcite is present in low amounts (~3%) and occurs as fine-grained aggregates, minute grains mixed with clay or as individual grains up to 75µm. A few carbonate forams are also present. Organic material occurs as carbonized plant fragments and accounts for approximately 1% of the sample. Some of the carbon retains preserved plant structure. Iron oxide occurs as small clots and rounded grains in the 1-2% range. Iron oxide is not detectable by XRD indicating most is amorphous. Other oxides present as a trace include magnetite, copper oxide and titanium oxide. The titanium generally occurs as rutile, leucoxene and titaniferous magnetite. FE-SEM and reflected light microscopy identified a trace of sulfides represented by several types. Pyrite is the most prominent followed by galena, sphalerite, stibnite, a Pb-Sb sulfosalt and a mixed sulfide composed of Fe, Pb, As, Sb, Cu and Zn Although this sample carries 2ppm total U, an extensive search using backscatter imaging and EDS X-ray microanalysis failed to locate detectable U. However, V and Th are associated with some rare earth mineralogy.

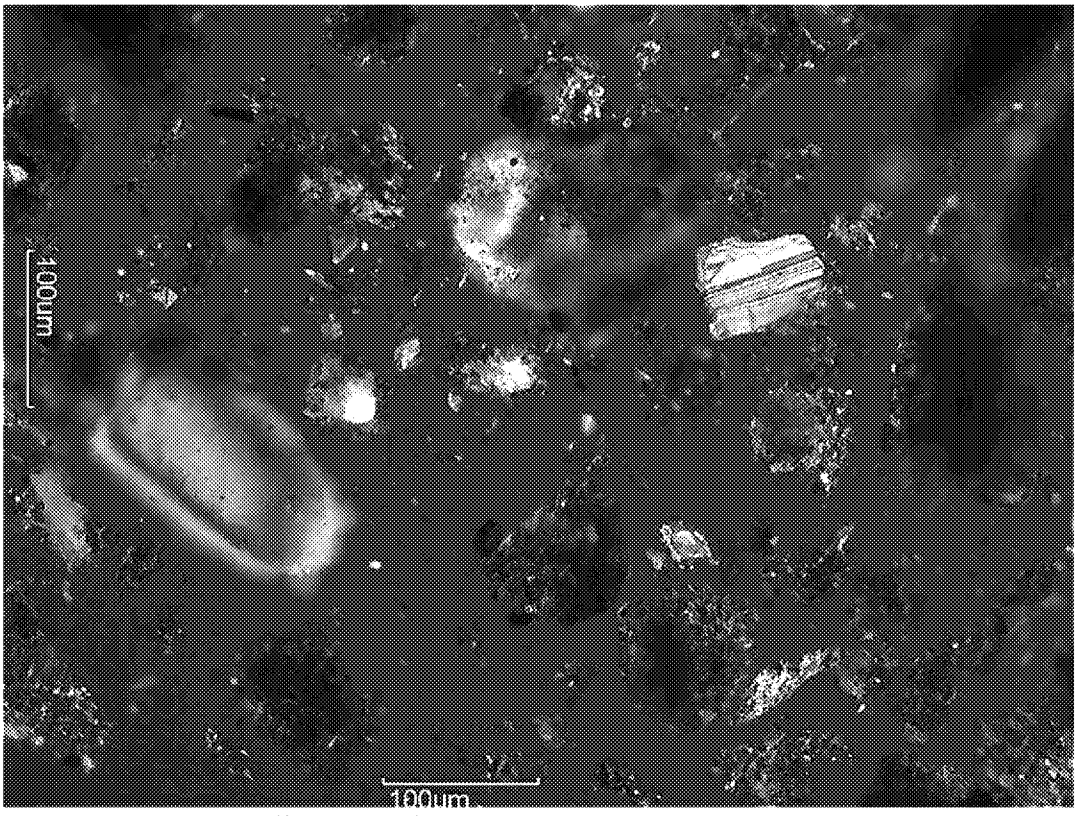
Client Sample No.: **DD2-BK-60-61-012618**
Small grain of yellow pyrite embedded in iron stained clay. Reflected light – 500X.



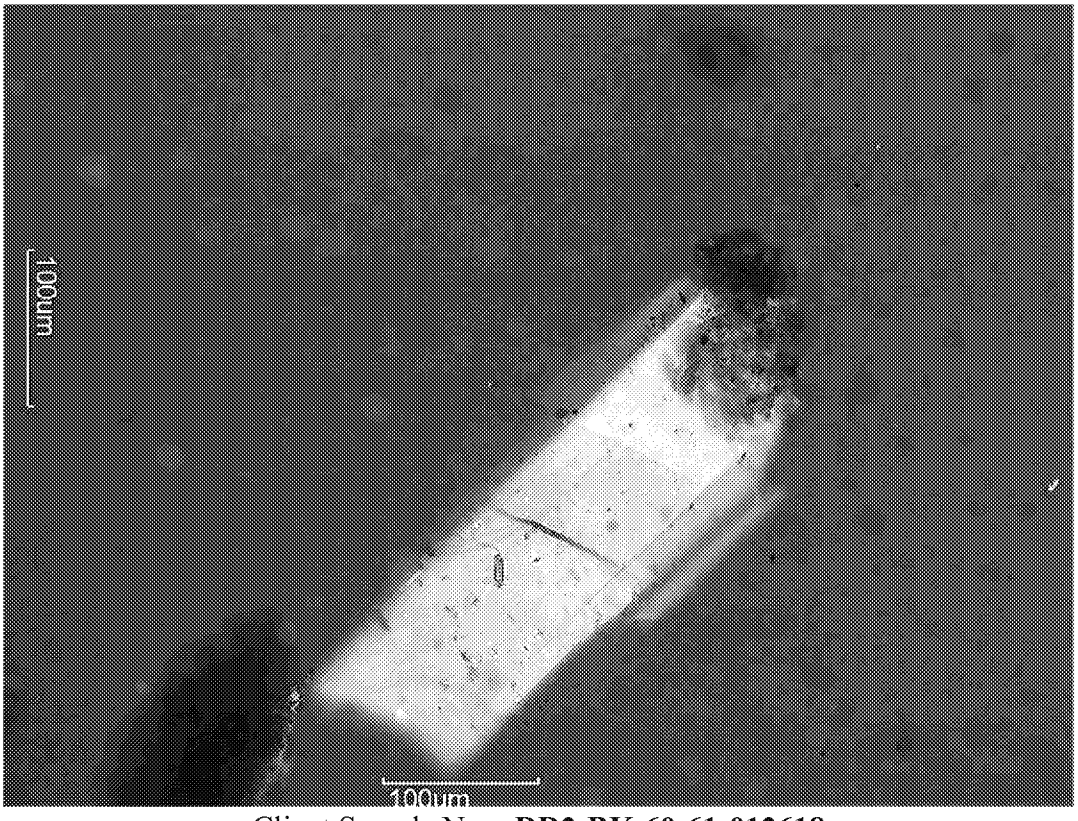
Client Sample No.: **DD2-BK-60-61-012618**
Black opaque carbon in a matrix of white clay. Reflected light crossed Nichols – 200X.



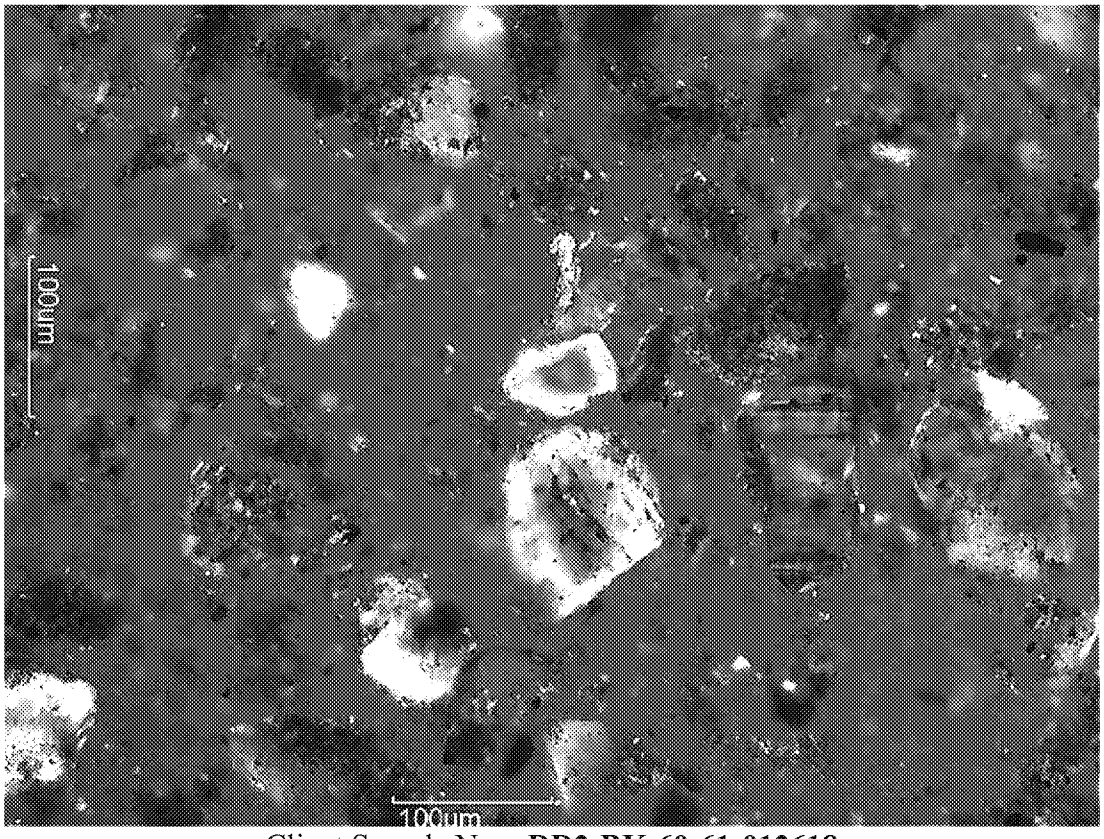
Client Sample No.: **DD2-BK-60-61-012618**
Clot of red iron oxide and opaque carbon in a matrix of iron oxide. Reflected light crossed Nichols – 200X.



Client Sample No.: **DD2-BK-60-61-012618**
Area photo showing very fine sand to silt sized quartz/feldspar, calcite and dark clay. Polarized light – 100X.

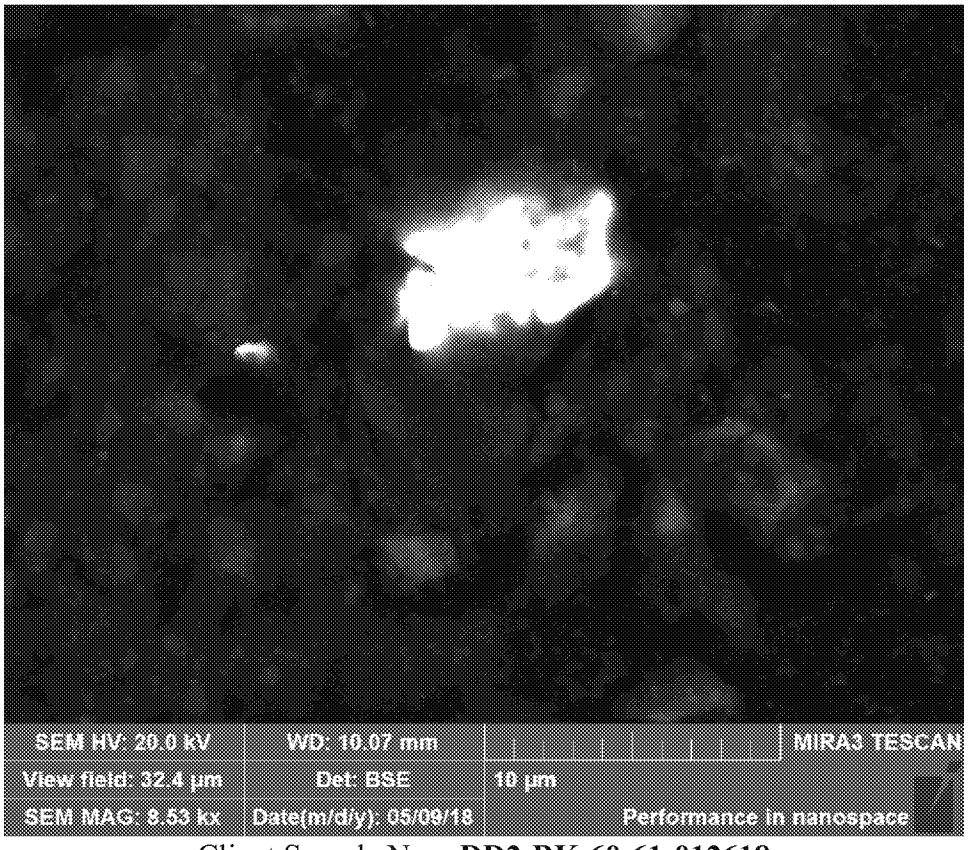


Client Sample No.: **DD2-BK-60-61-012618**
A fragment of selenite gypsum with dark clay. Polarized light – 100X.



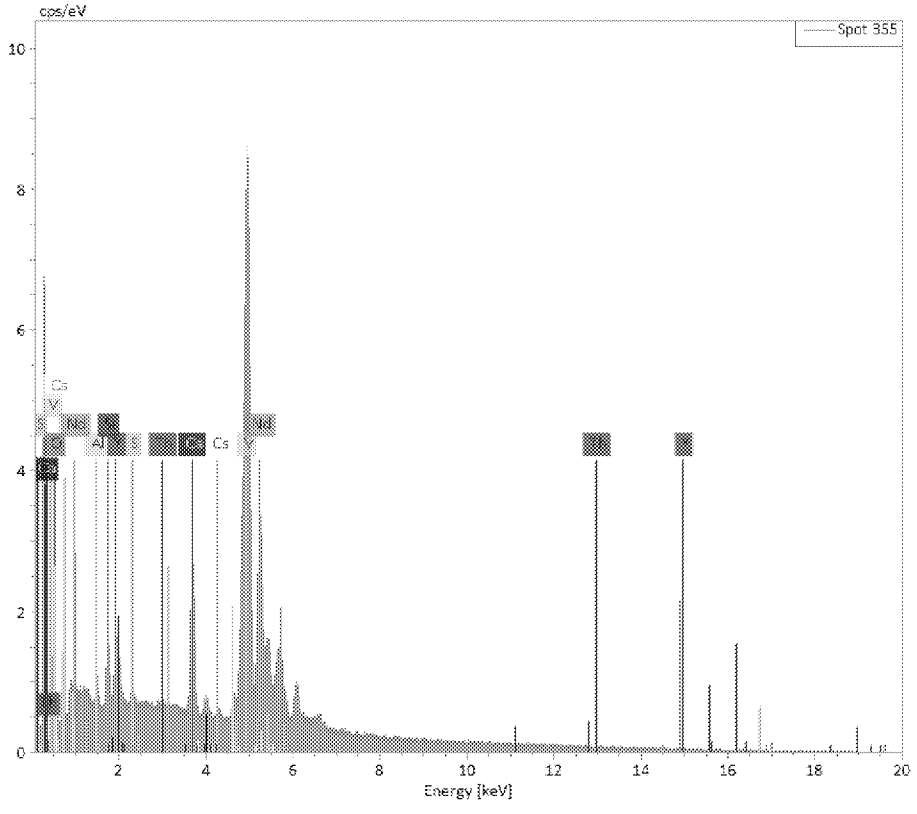
Client Sample No.: **DD2-BK-60-61-012618**

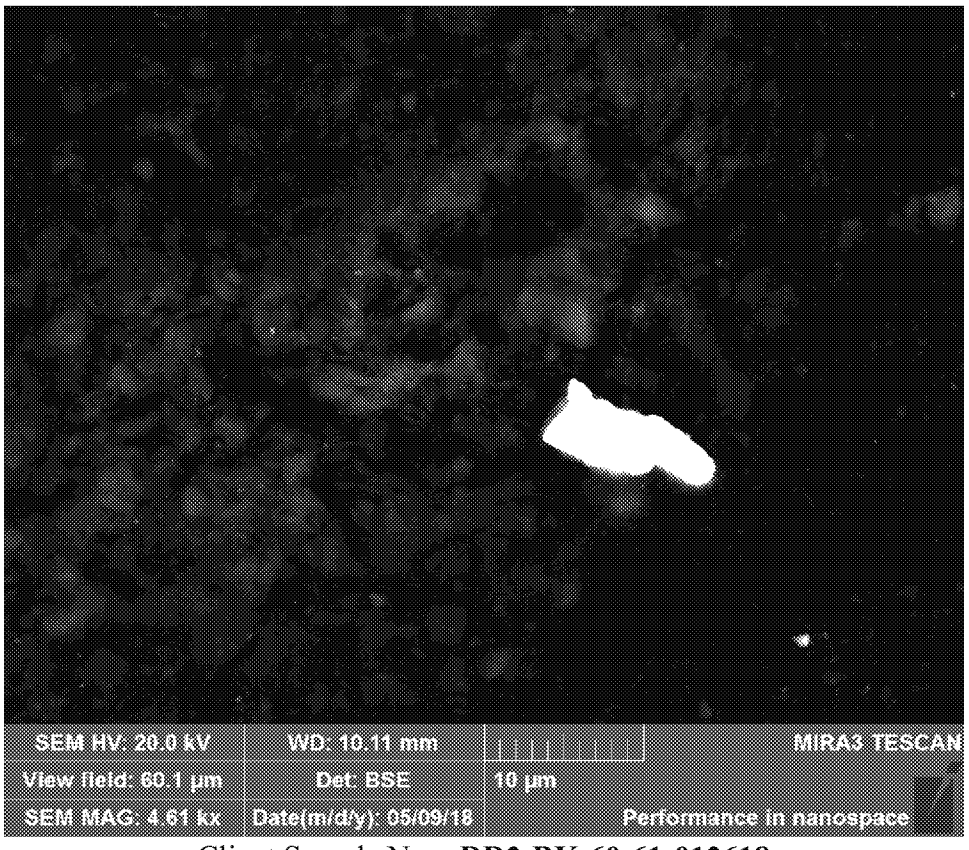
Numerous fragments of very fine sand to silt sized quartz/feldspar and dark clay riddled with opaques. Polarized light – 100X.



Client Sample No.: **DD2-BK-60-61-012618**

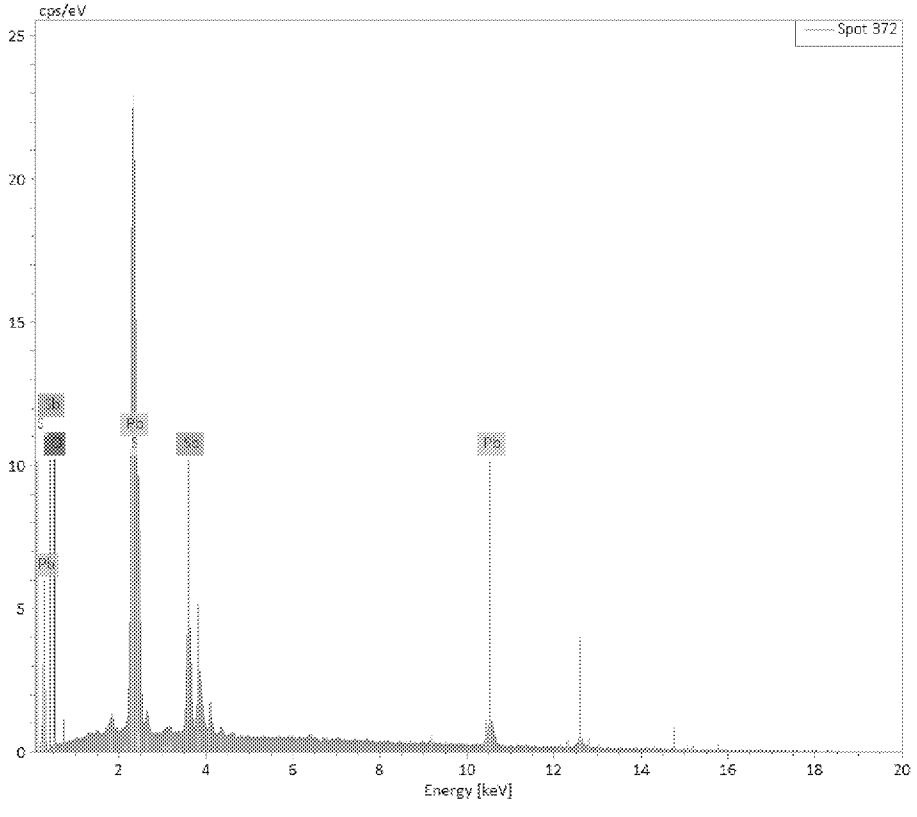
Backscatter image showing a bright grain composed of REE's with vanadium included in a clay mass – 8530X.

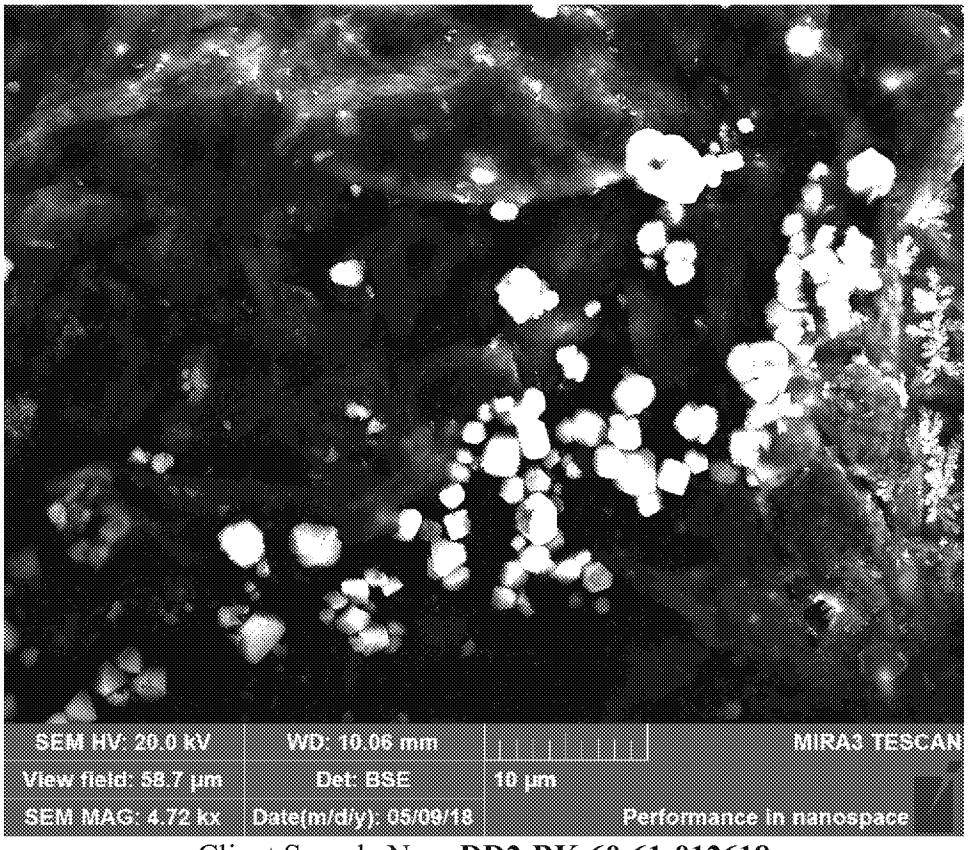




Client Sample No.: **DD2-BK-60-61-012618**

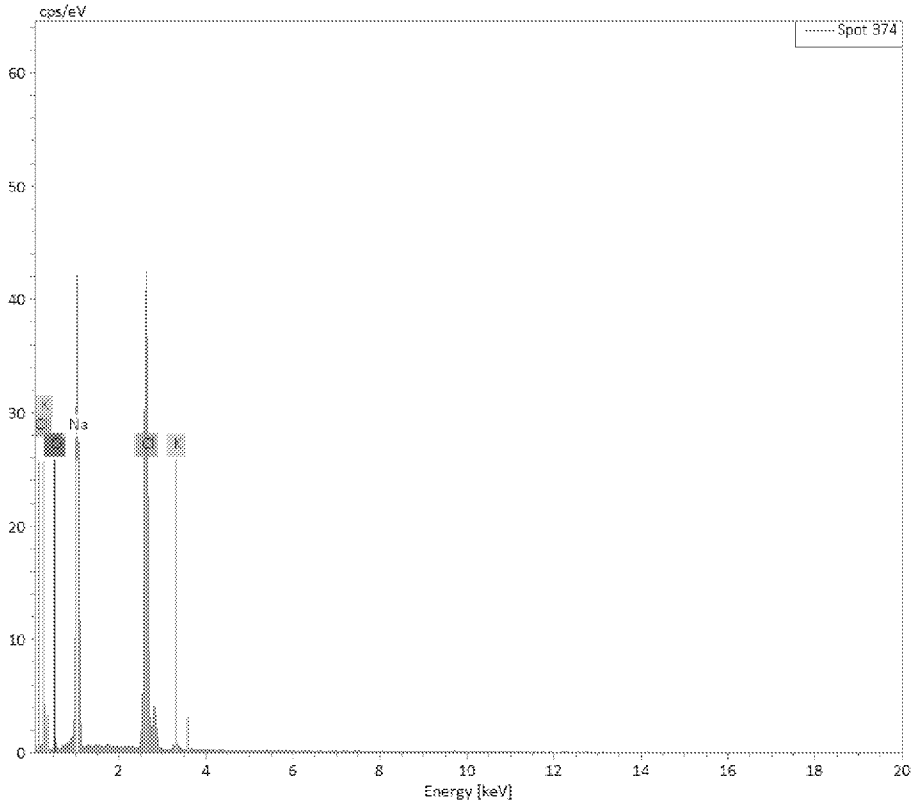
Backscatter image of clay with a bright grain of Pb-Sb-sulphosalt – 4,610X.

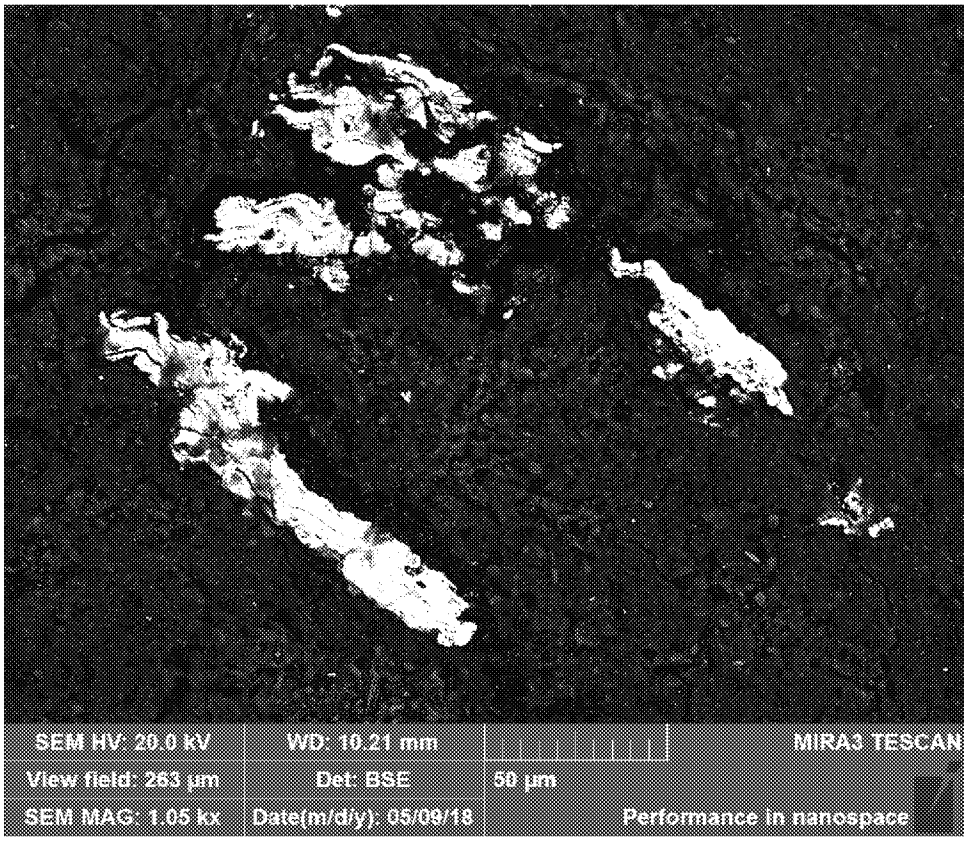




Client Sample No.: **DD2-BK-60-61-012618**

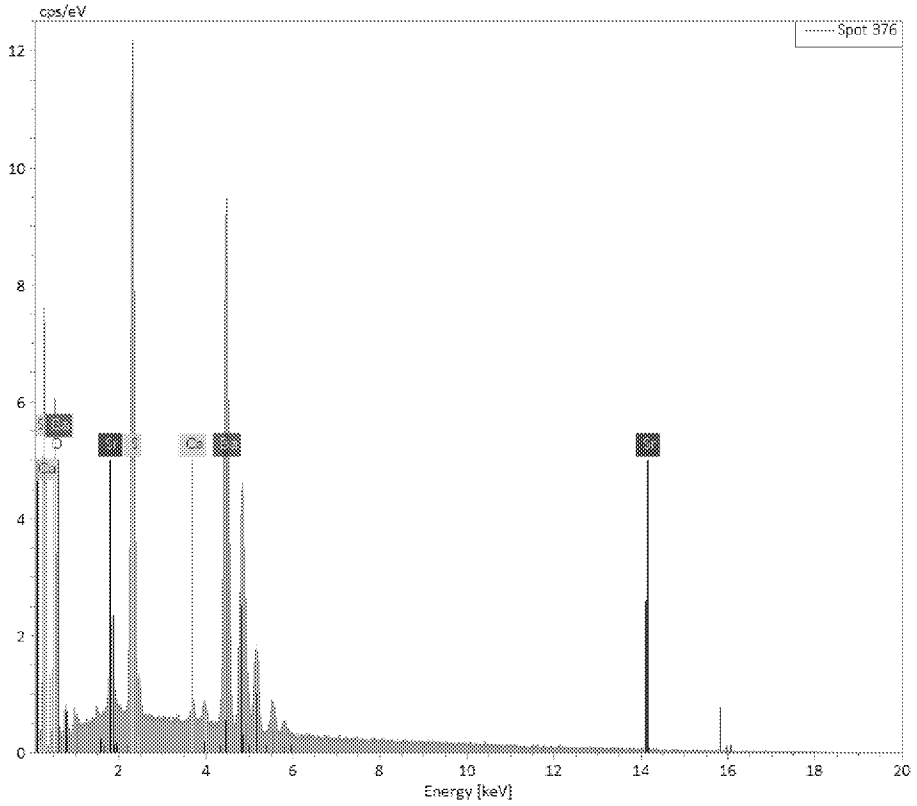
Backscatter image of a clay pocket filled with cubes of halite – 4,720X.

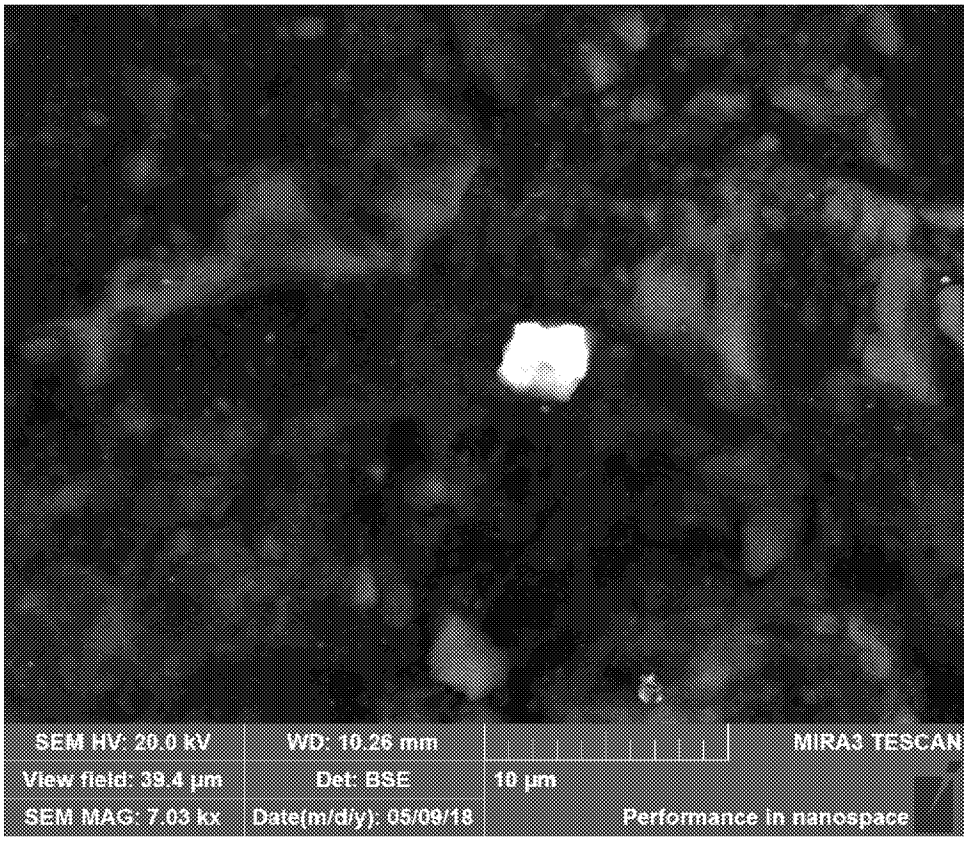




Client Sample No.: **DD2-BK-60-61-012618**

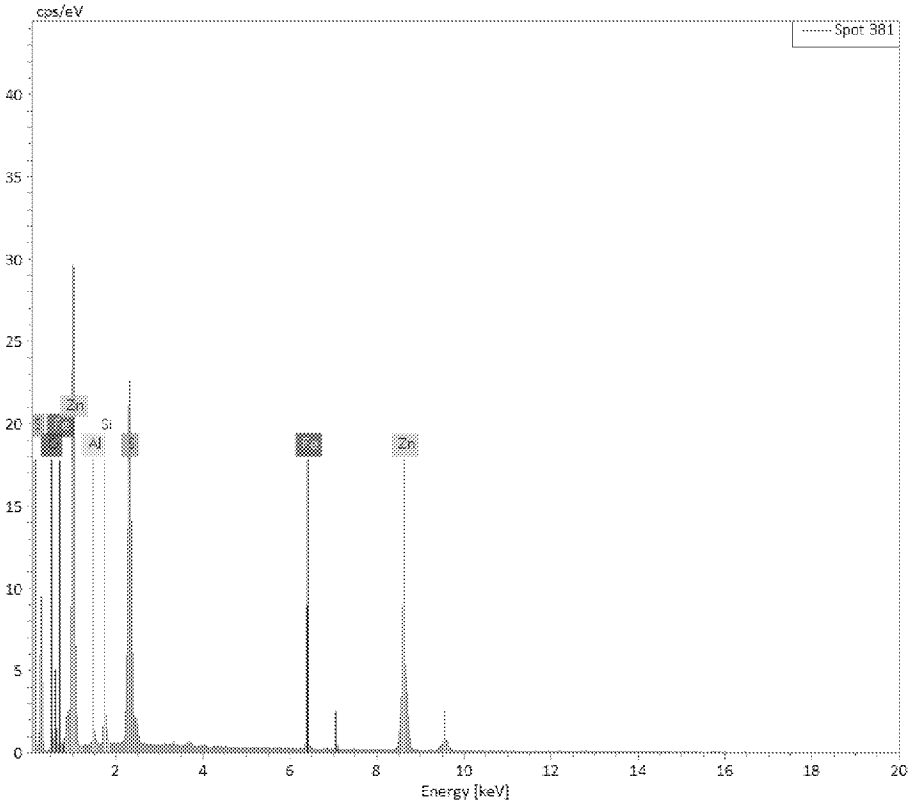
Backscatter image of clay with thin seams of barite – 1,050X.

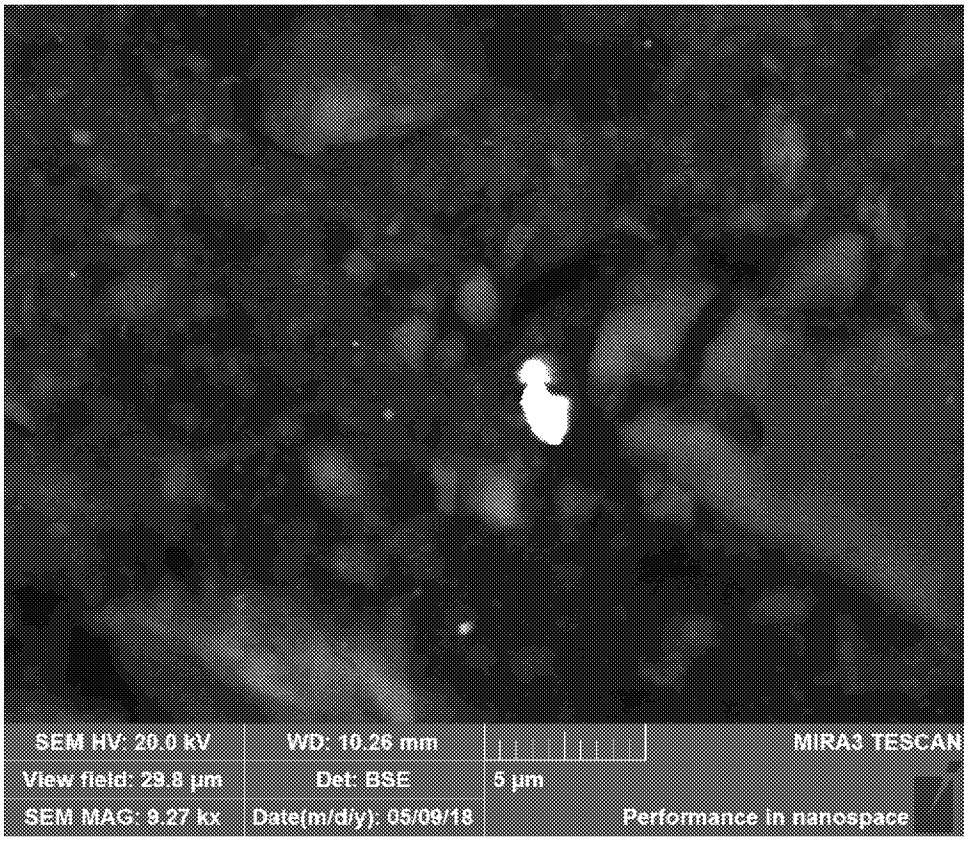




Client Sample No.: **DD2-BK-60-61-012618**

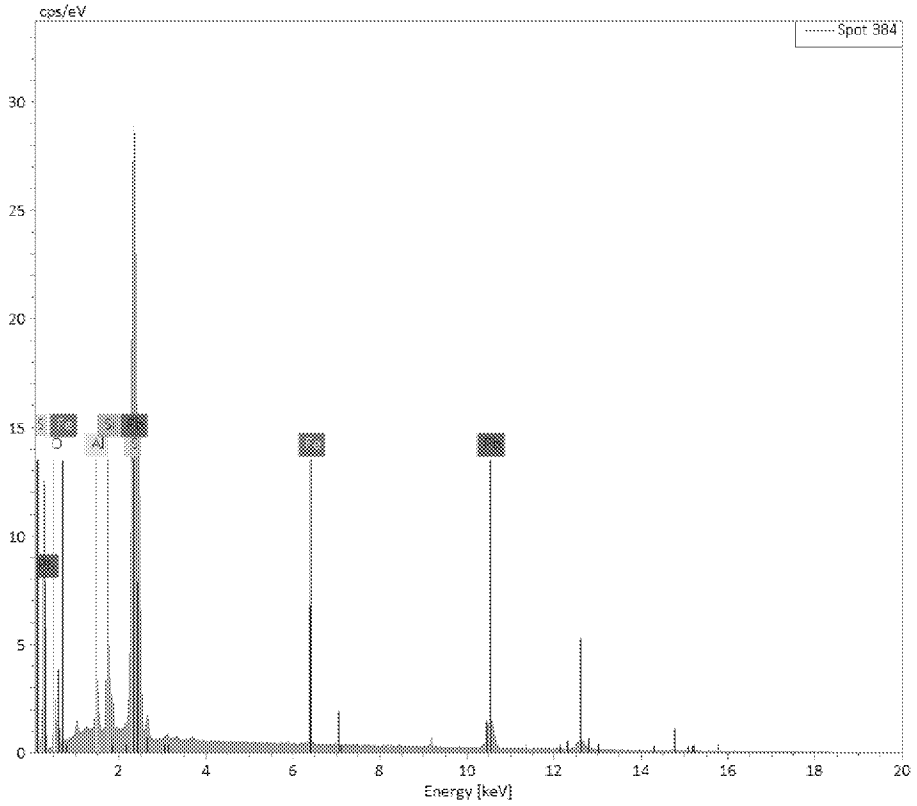
Backscatter image of a small sphalerite fragment included in clay – 7,030X.

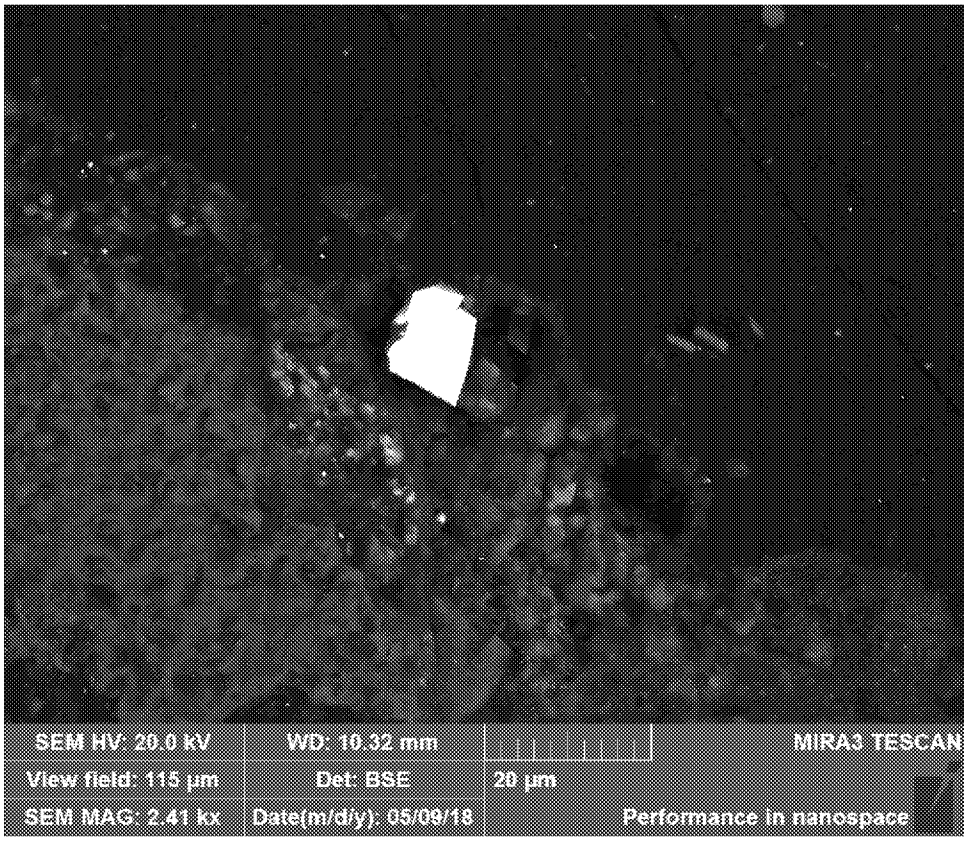




Client Sample No.: **DD2-BK-60-61-012618**

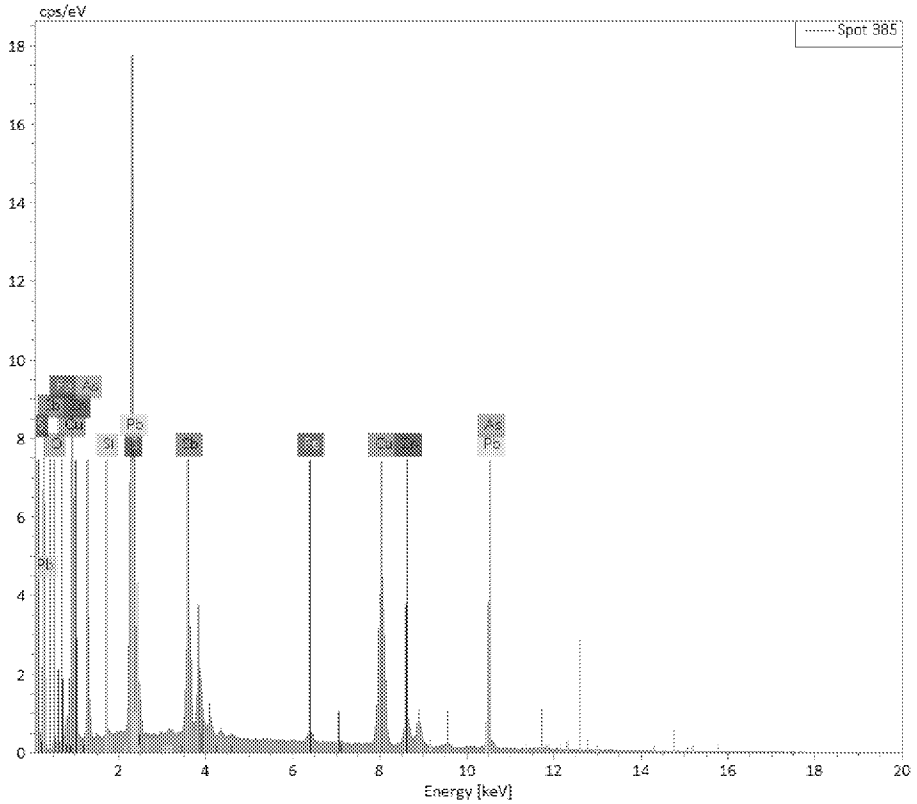
Backscatter image of clay/silt with a small bright grain of galena – 9,270X.

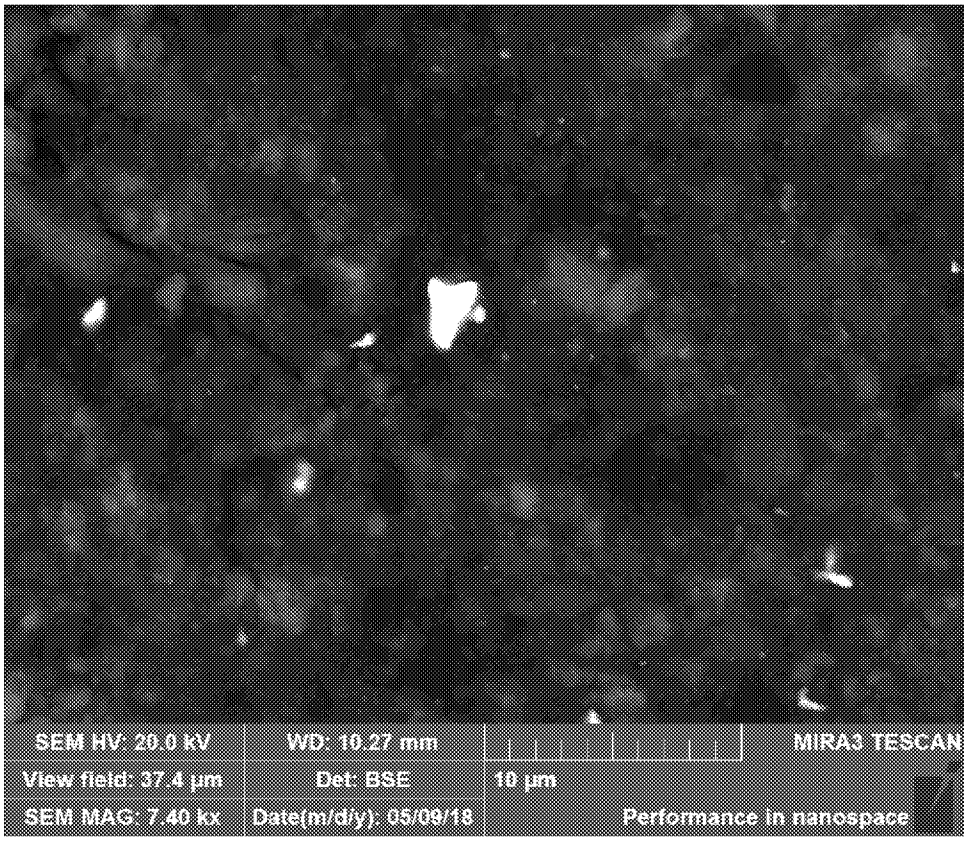




Client Sample No.: **DD2-BK-60-61-012618**

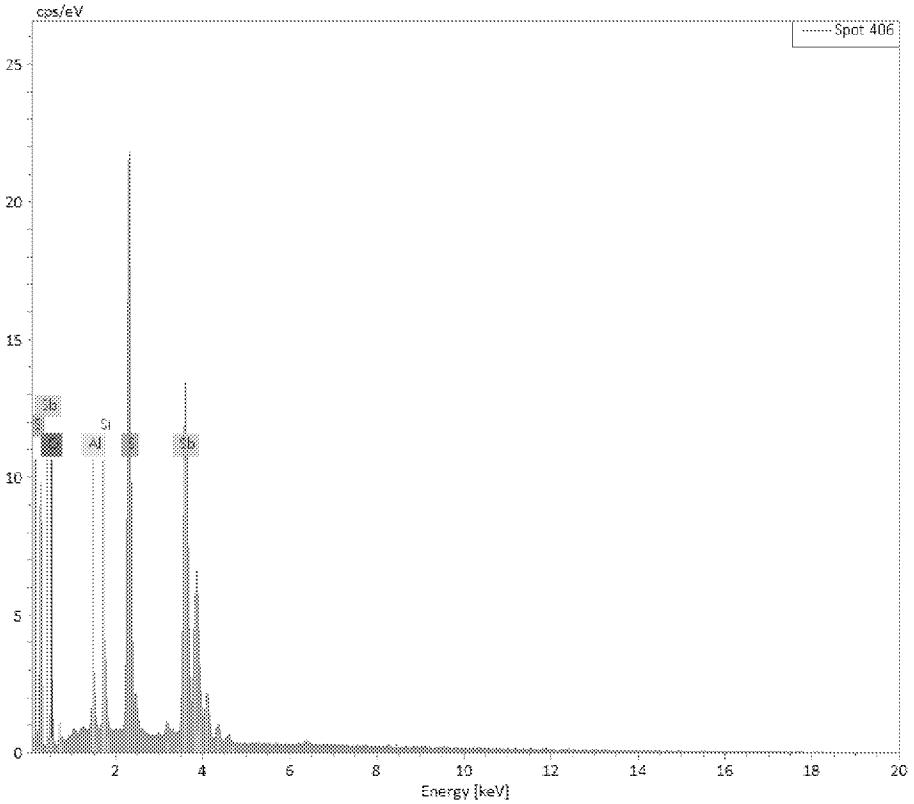
Backscatter image of clay with an included mixed metal sulfide grain – 2,410X.





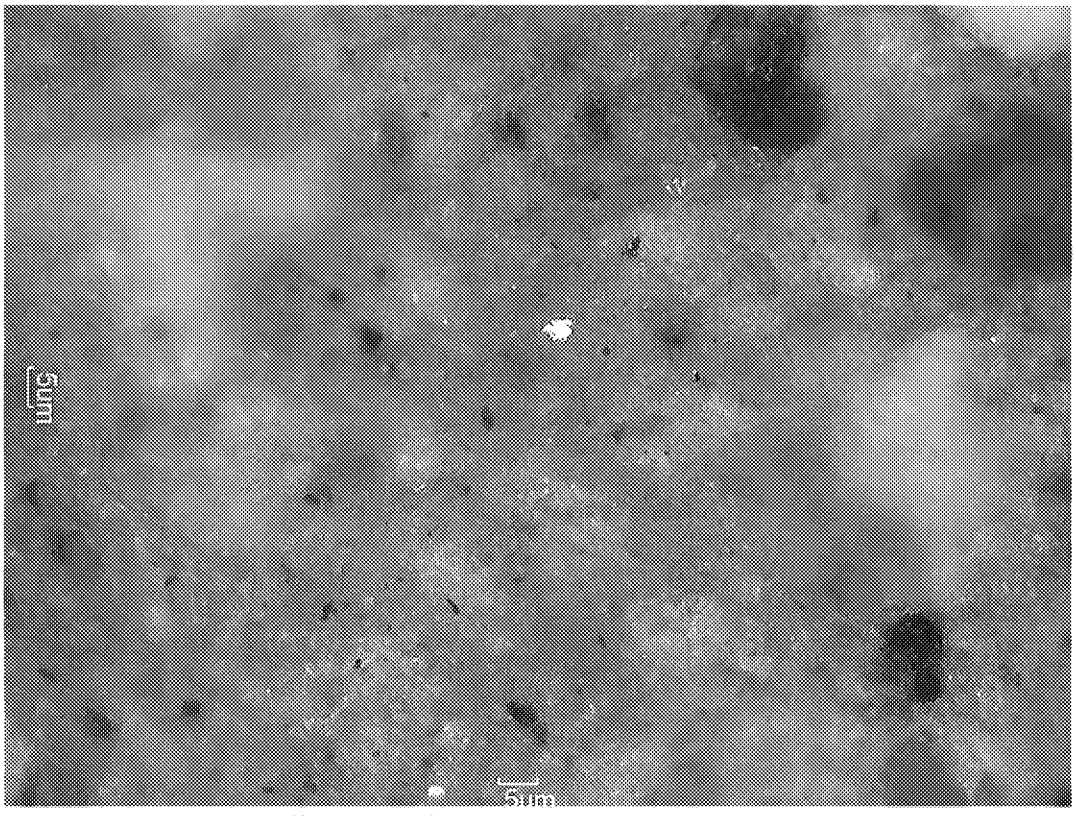
Client Sample No.: **DD2-BK-60-61-012618**

Backscatter image of clay mass with a bright grain of antimony sulfide (stibnite?) – 7,400X.

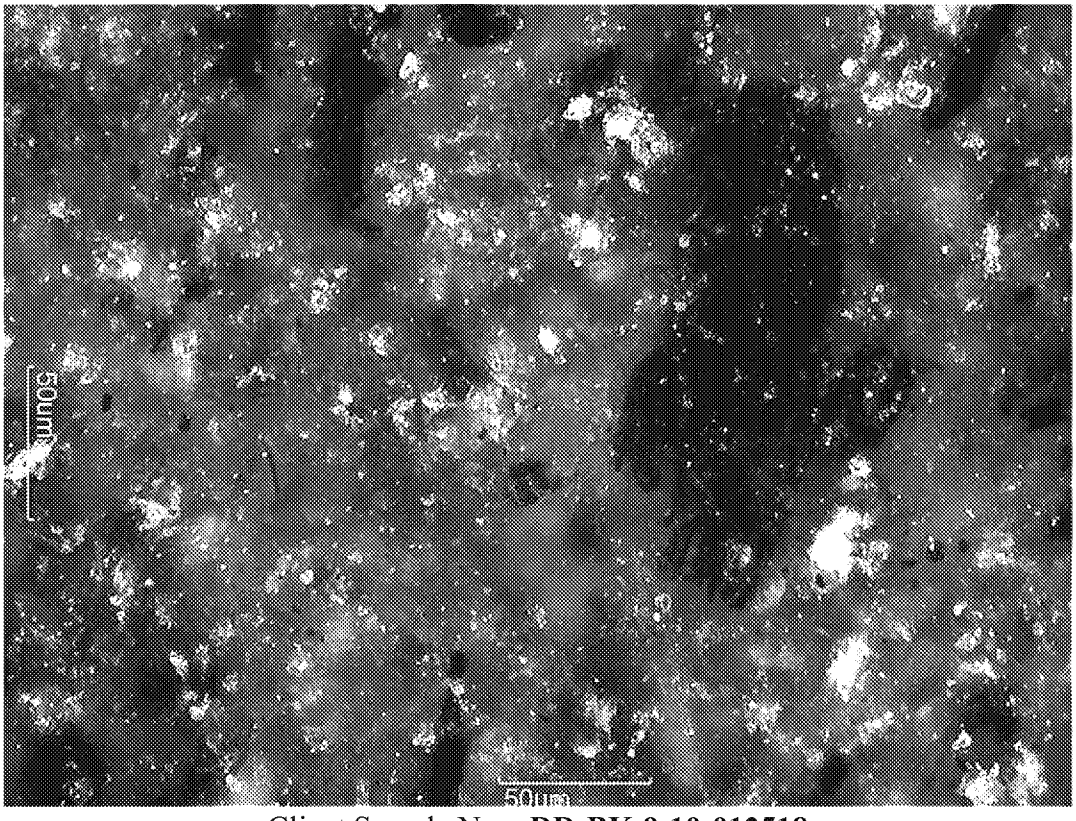


Client Sample No: **DD-BK-9-10-012518**

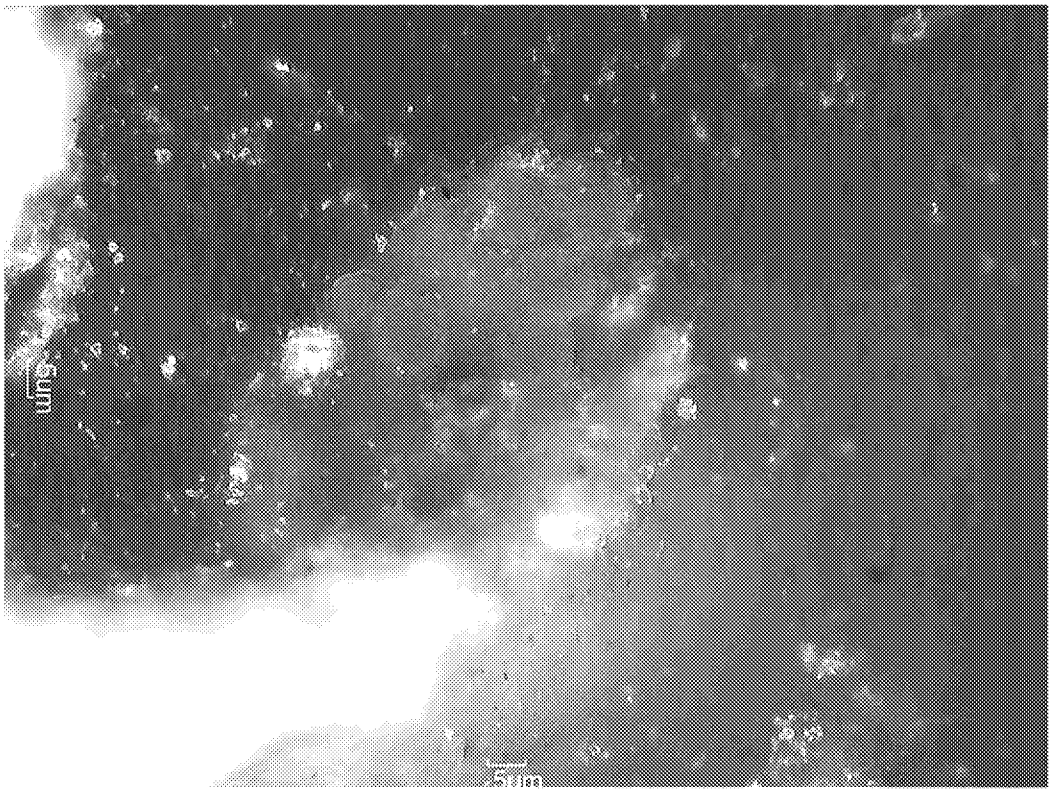
This sample is a tan colored, very fine sand to silty clay. Due to the high clay content of this sample a standard thin section could not be prepared, therefore, reflected light microscopy studies were performed on a polished billet and transmitted light microscopy examination was achieved using grain mounts. The polished billet was carbon coated and used for study by FE-SEM/EDS. XRD indicates the primary clay is swelling smectite (~23%) followed by kaolinite (~11%) and illite at (~4%). The clay has a dirty to almost opaque appearance due to inclusions of carbonized plant material. The bulk of the sediment's mass is primarily quartz followed by feldspar. Quartz (~38%), occurs as well rounded to angular grains that vary greatly in size from fine to course silt (5μm-50μm) and very fine to fine sand (65μm-250μm). A small population of the silica (~1%) is in the form of rounded grains of dirty looking microcrystalline chert. Potassium feldspar (~9%) is the dominant type and is a mix of mainly orthoclase and lesser amounts of microcline. Orthoclase/microcline occurs as angular to sub-rounded grains in the silt to fine sand size. The orthoclase is generally cloudy in appearance and microcline is water clear. Slightly lower amounts of plagioclase (~7%) occur as angular to sub-rounded grains in the silt to fine sand size. Refractive index studies indicate an albite to andesine composition. Some of the plagioclase shows mild seritization. Other silicates include a trace of mica, zircon and rare amphibole. Calcite is present in low amounts (~5%) and occurs as very fine aggregates and individual grains that measure up to 100μm. Fine grained calcite is seen intimately mixed with clay. The only sulfate identified in the sample is a trace of fine grained barite that carries low Sr. Although iron oxide is not detectable by XRD several examples were identified by reflected light microscopy and concentration is estimated to be around 1-2%. Iron oxide occurs as small featureless clots, rosettes and pseudomorphs after pyrite framboids. Oxides of titanium, copper and a trace of magnetite are also present. Sulfides occur as a trace and are represented by several types. Pyrite is the most common followed by chalcopyrite, galena and stibnite. The grains are generally very small with a maximum size of around 4-5μm. This sample contains a very low concentration of U at the 1ppm level. An extensive search and analysis by EDS X-ray microanalysis of clays, iron oxide and carbon fragments failed to detect adsorbed or discrete U phases. The majority of rare earth phosphates carry low amounts of Th and most of the zircon contains Ce. A few small grains of native Au were identified.



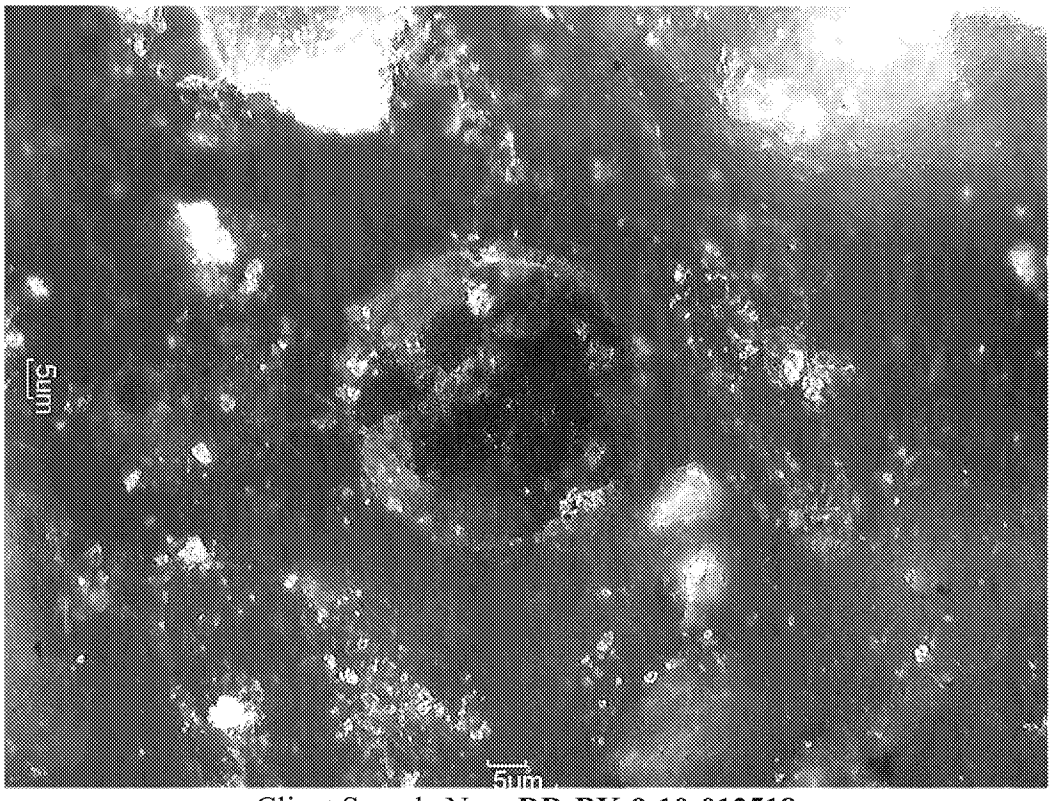
Client Sample No.: **DD-BK-9-10-012518**
Small grain of pyrite embedded in an iron stained clay matrix with numerous black grains of carbon. Reflected light – 500X.



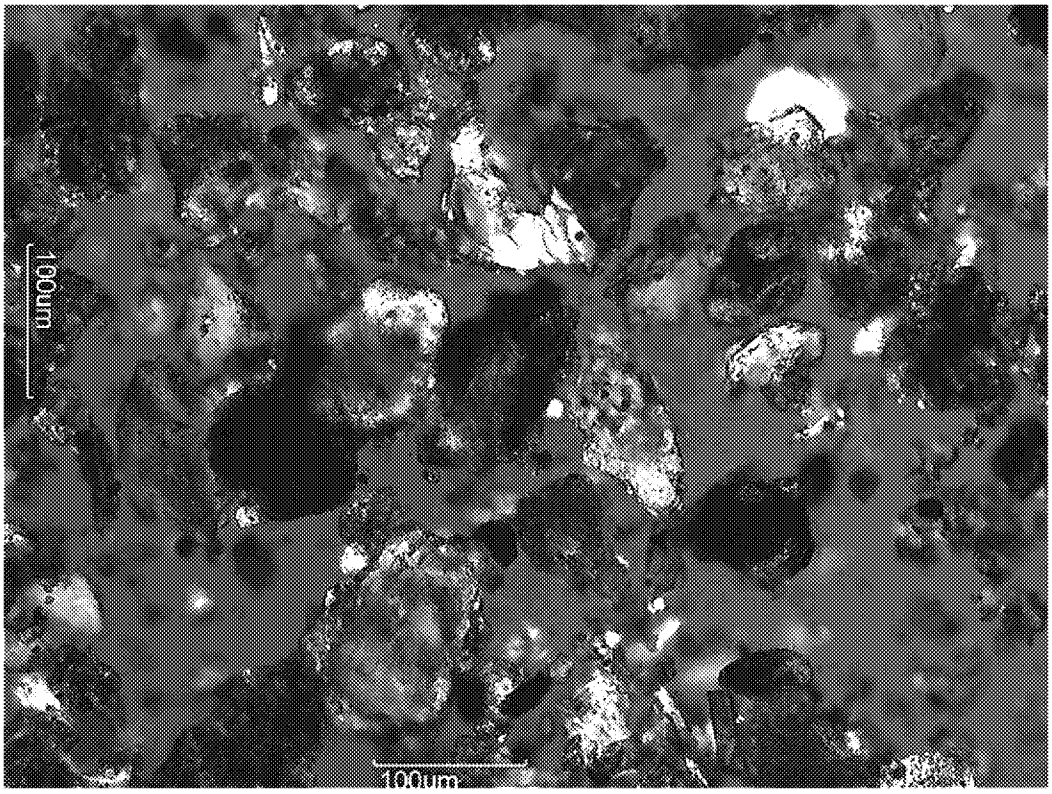
Client Sample No.: **DD-BK-9-10-012518**
Black carbon and reddish orange iron oxide in clay. Reflected light crossed Nichols – 200X.



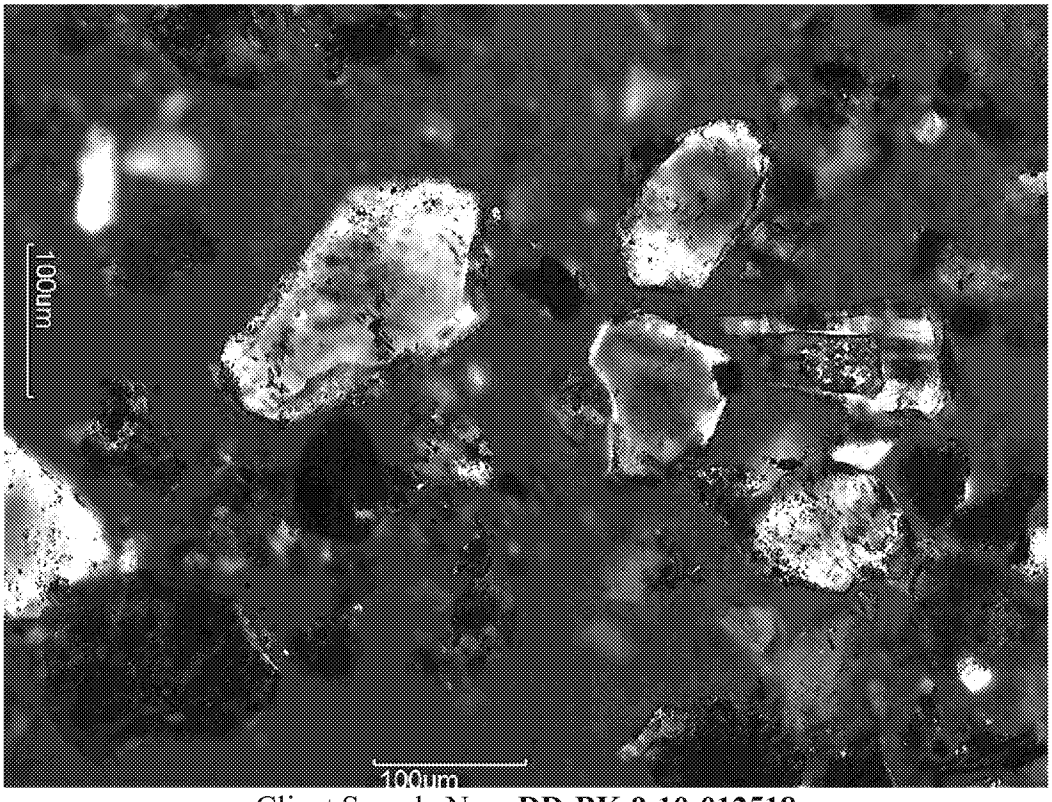
Client Sample No.: **DD-BK-9-10-012518**
Cluster of iron oxide spheres that likely represent hematite/goethite after pyrite framboids in a clay matrix. Reflected light crossed Nichols – 500X.



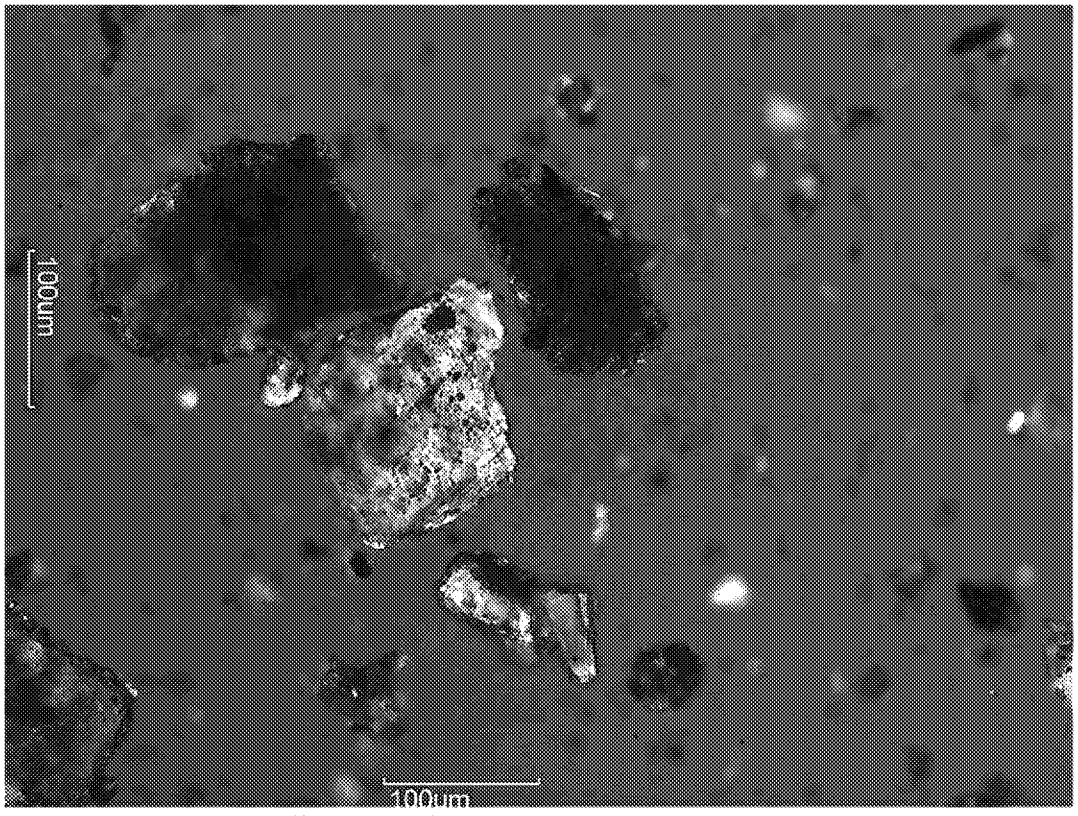
Client Sample No.: **DD-BK-9-10-012518**
A couple of hematite/goethite pseudomorphs after pyrite framboids. Reflected light crossed Nichols – 500X.



Client Sample No.: **DD-BK-9-10-012518**
Very fine sand to silt sized quartz/feldspar, calcite and clay masses with opaque inclusions. Polarized light – 100X.

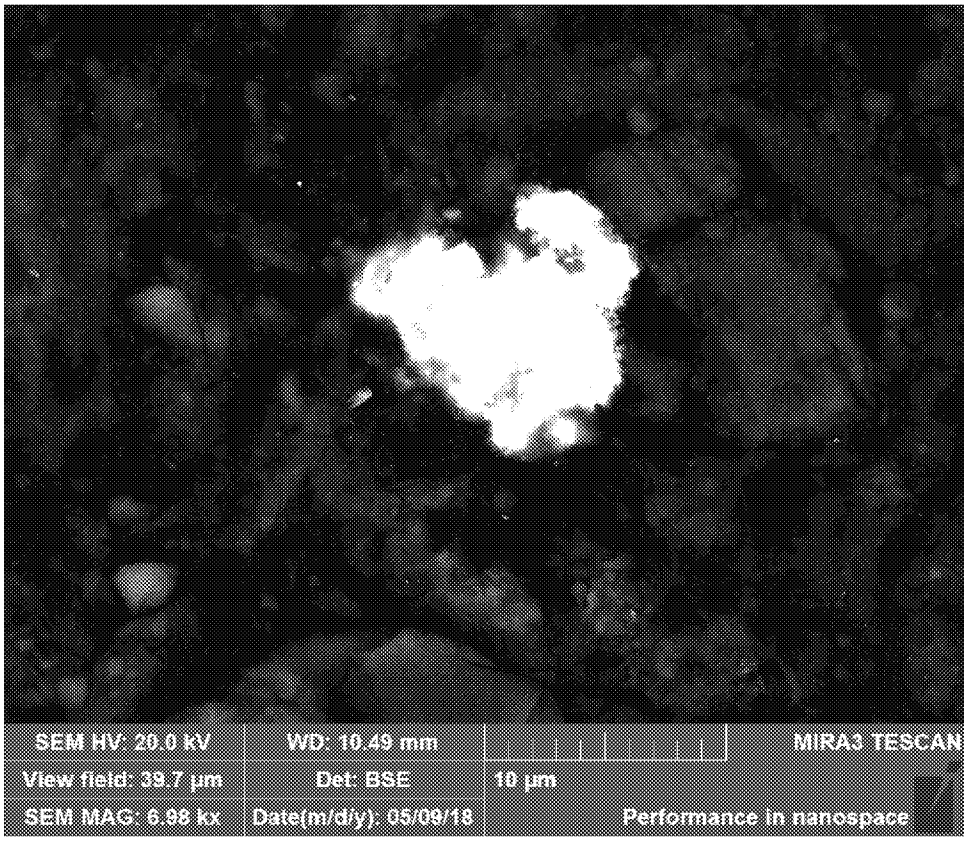


Client Sample No.: **DD-BK-9-10-012518**
Very fine sand to silt sized quartz/feldspar and clay masses with opaque inclusions. Polarized light – 100X.

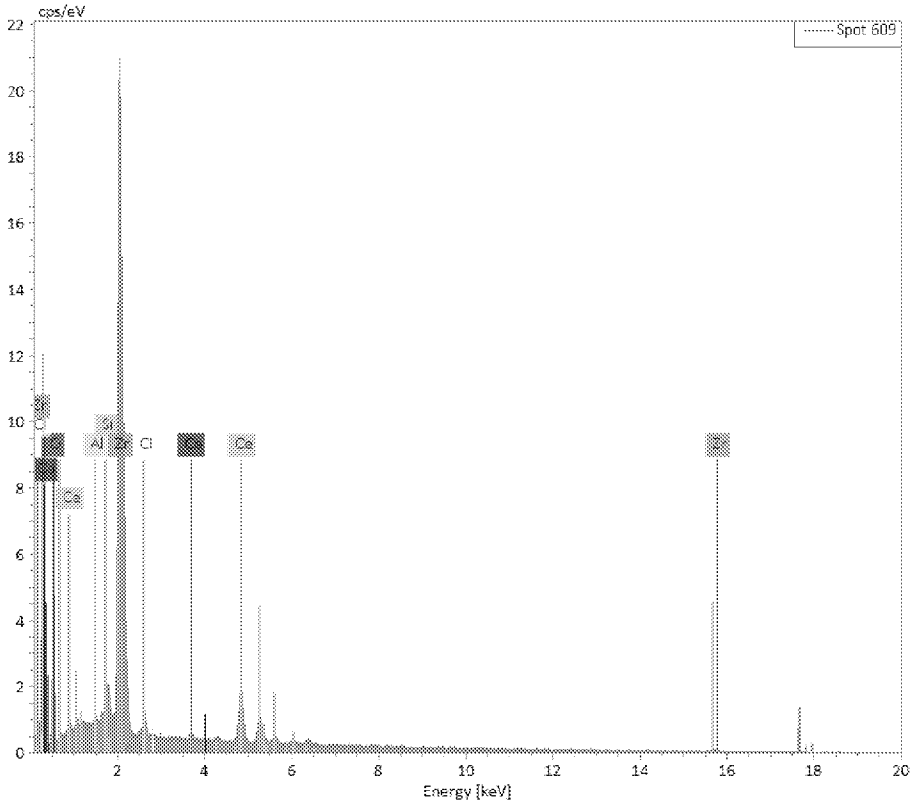


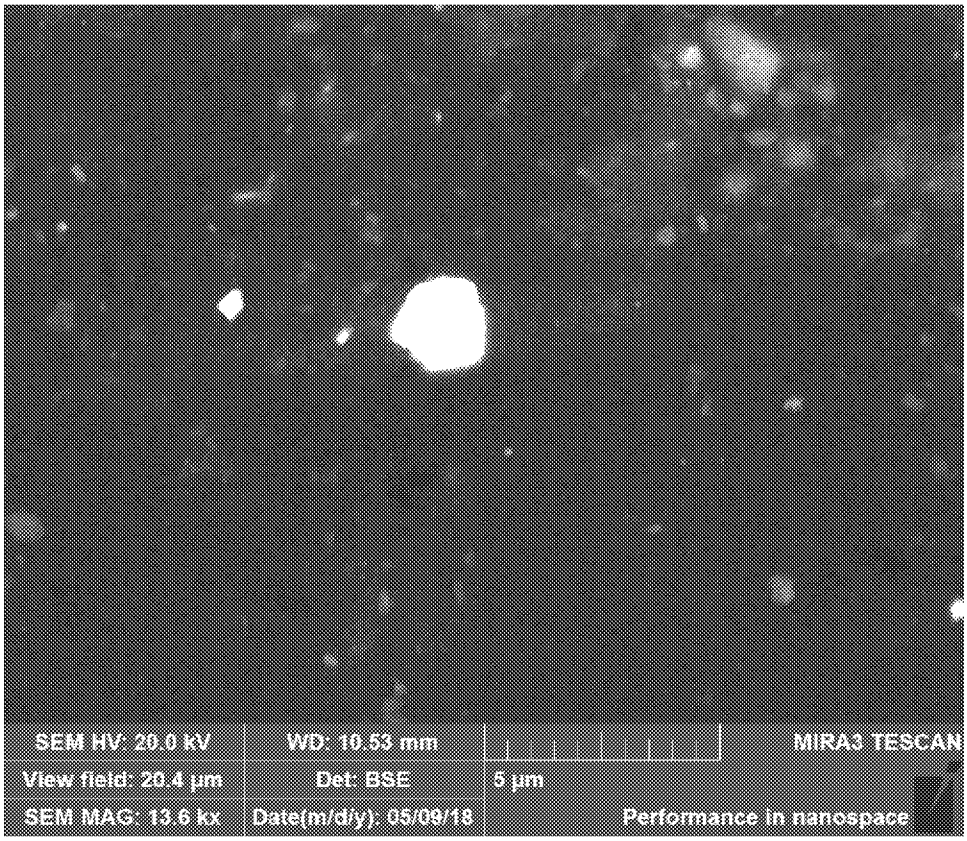
Client Sample No.: **DD-BK-9-10-012518**

Fragment of calcite is flanked by dark clay and some quartz. Polarized light – 100X.



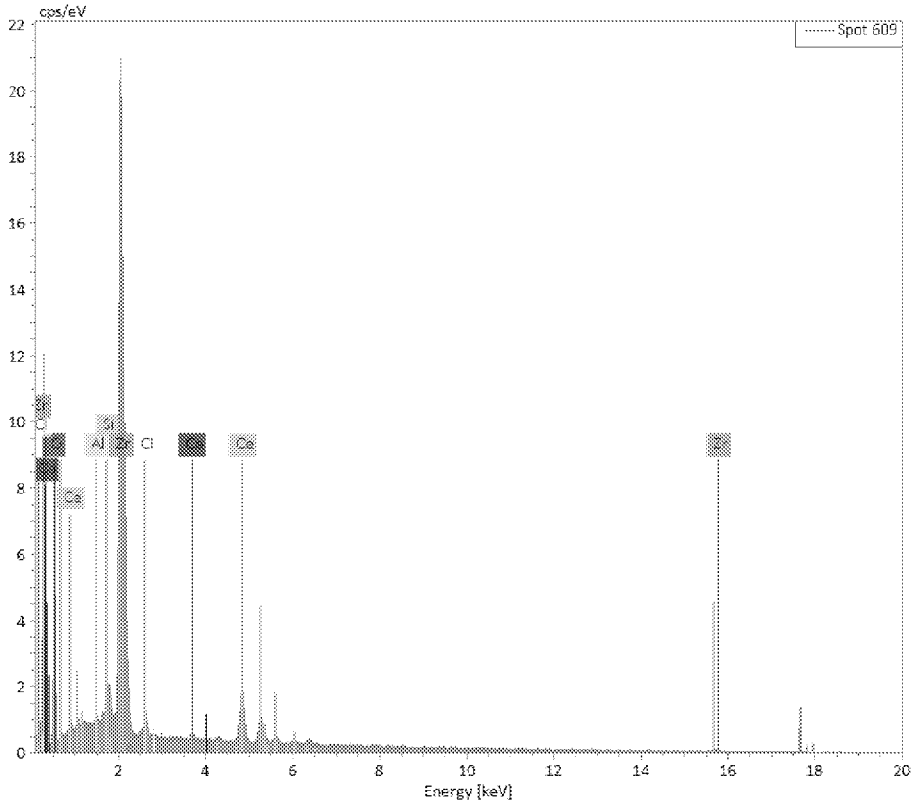
Client Sample No.: **DD-BK-9-10-012518**
Backscatter image of barite in clay matrix – 6,980X.

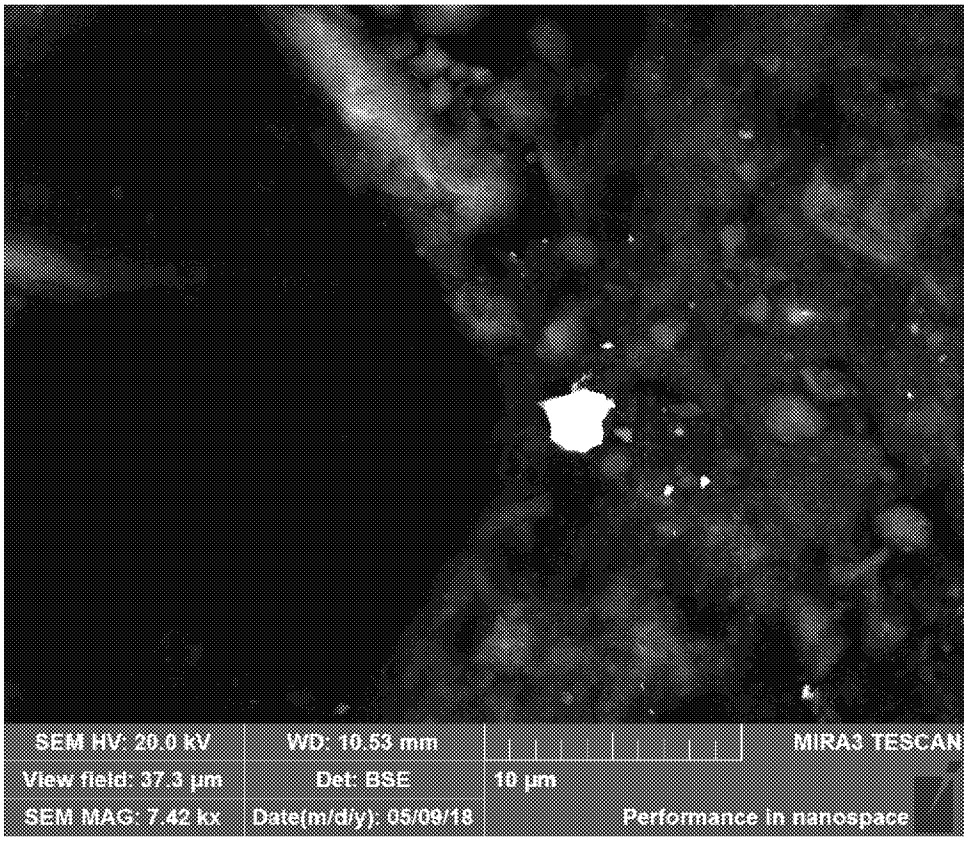




Client Sample No.: **DD-BK-9-10-012518**

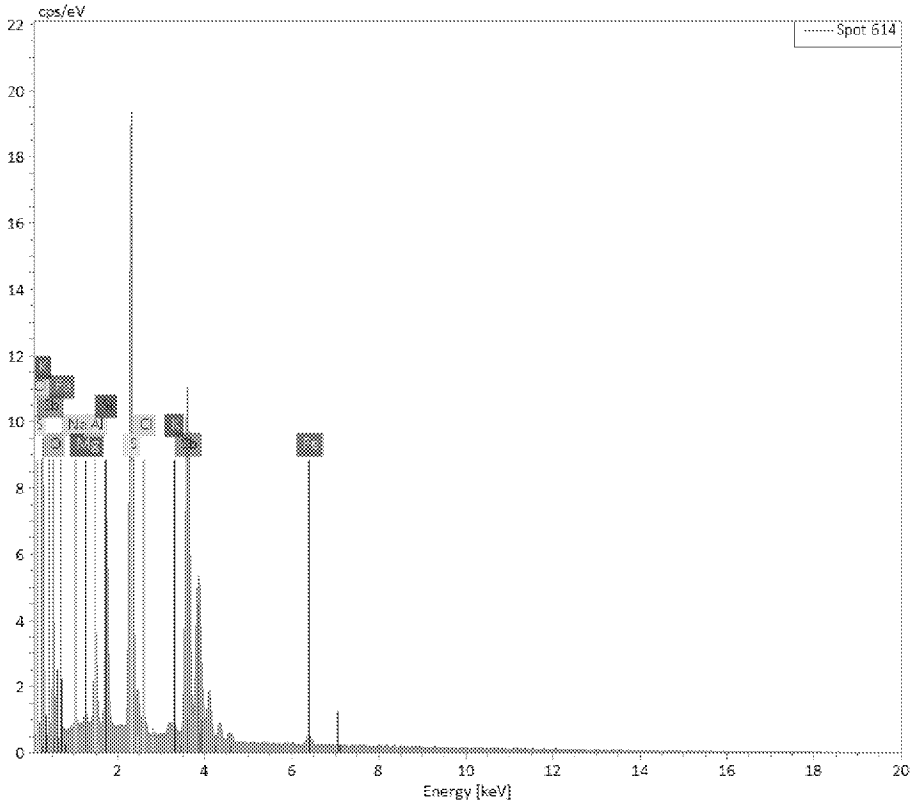
Backscatter image showing three liberated grains of bright zircon with Ce content – 13,600X.

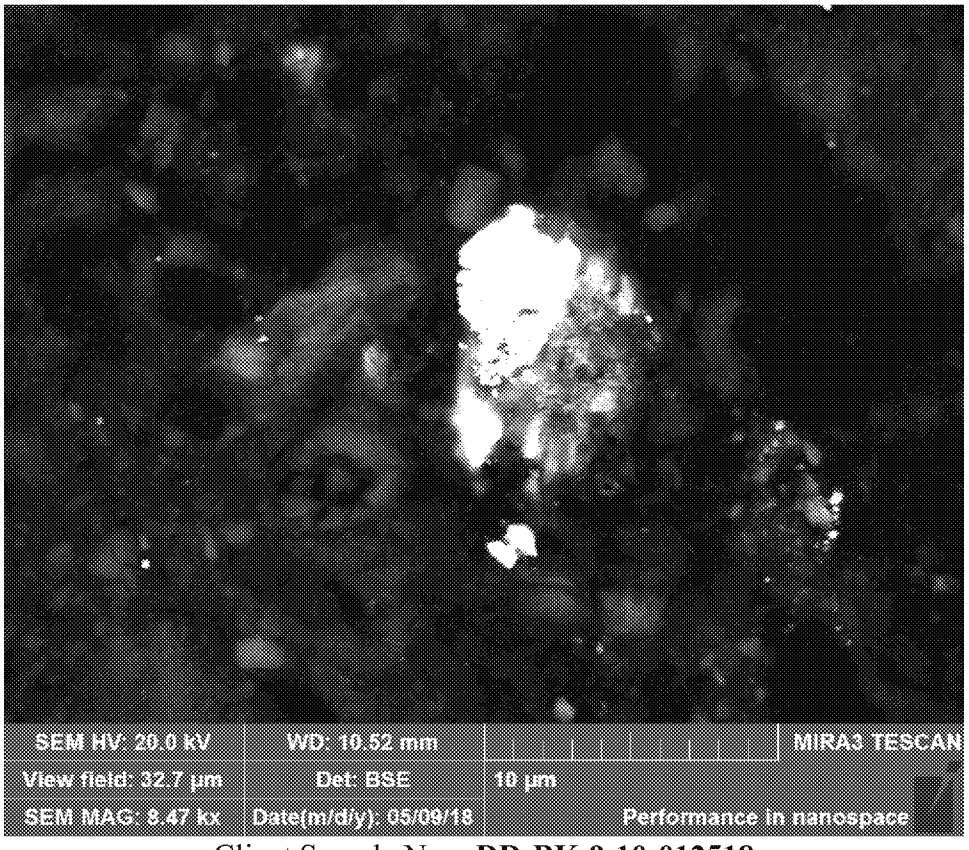




Client Sample No.: **DD-BK-9-10-012518**

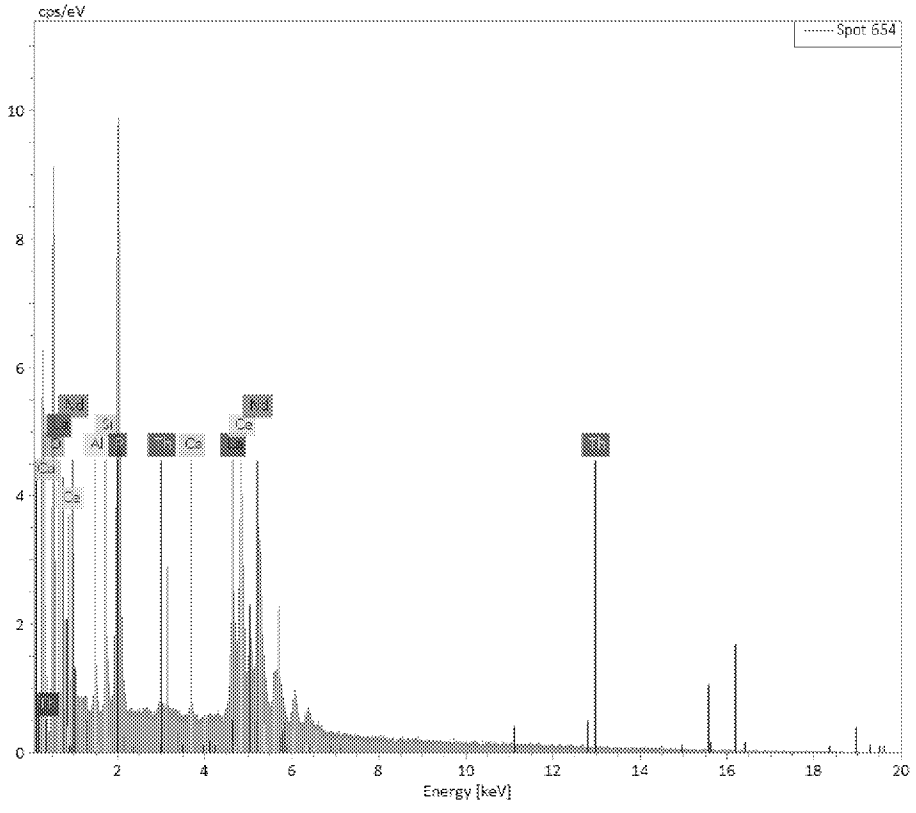
Backscatter image of an antimony sulfide grain in clay – 7,420X.

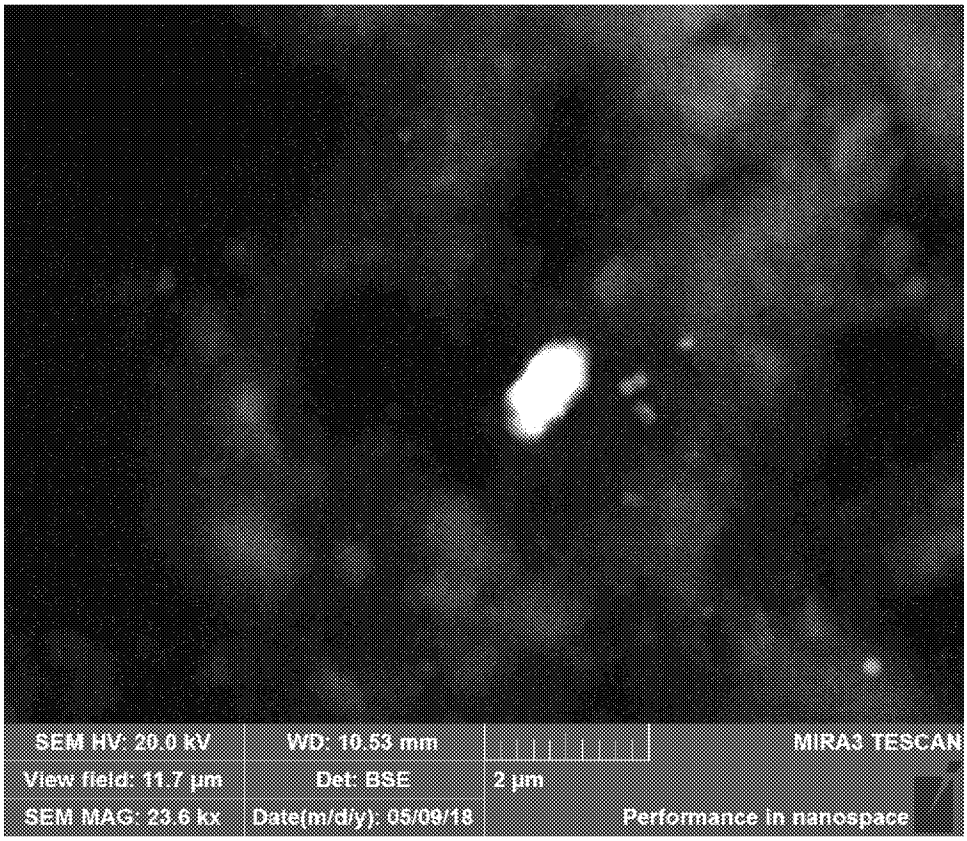




Client Sample No.: **DD-BK-9-10-012518**

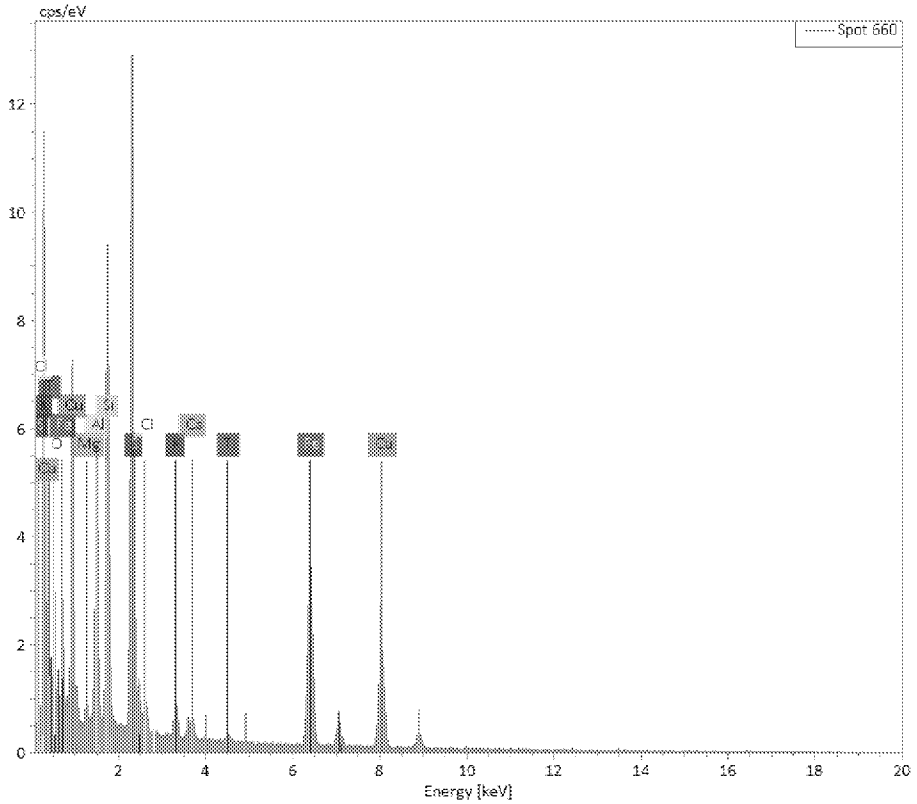
Backscatter image of a rare earth phosphate with some Th content embedded in clay – 8,470X.





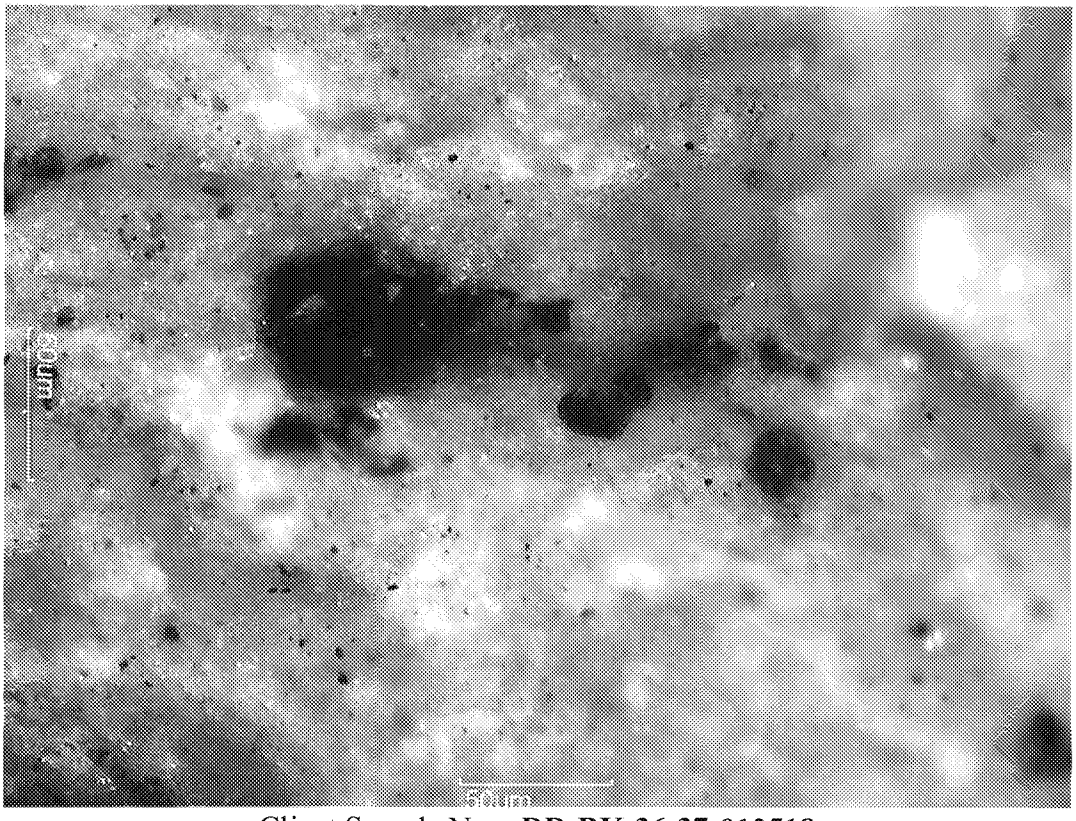
Client Sample No.: **DD-BK-9-10-012518**

Backscatter image of a clay mass with a minute grain of chalcopyrite – 23,600X.

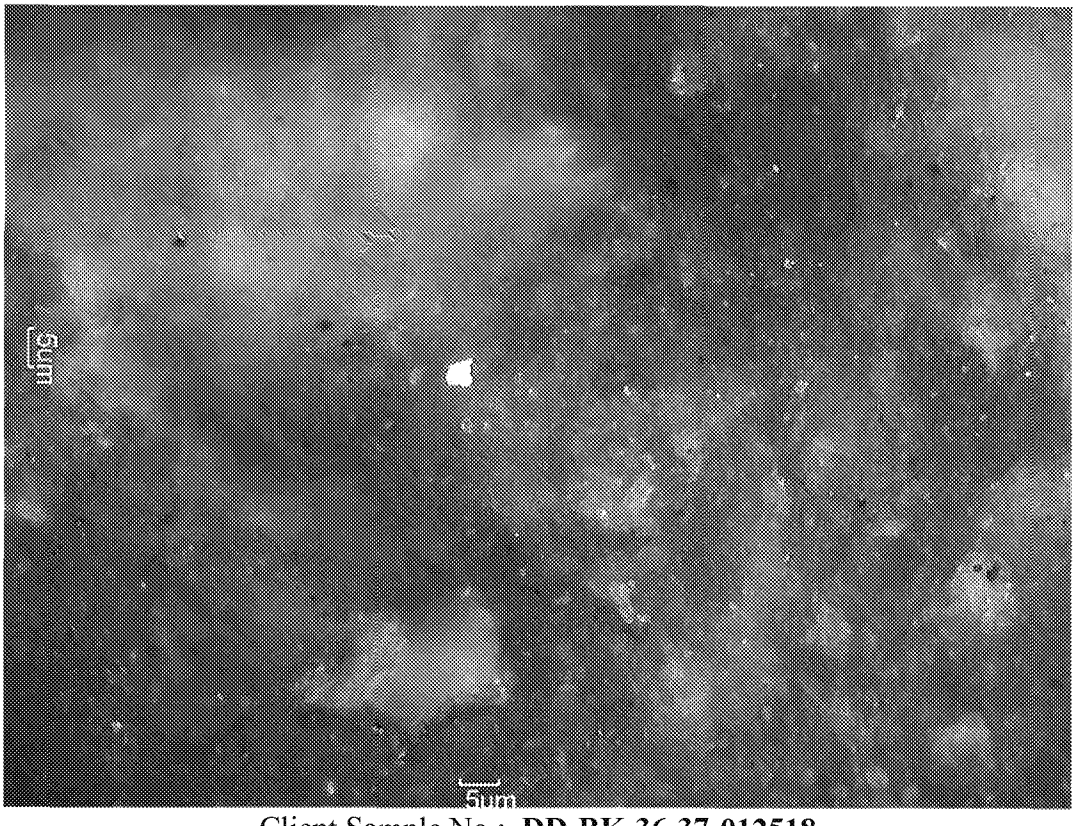


Client Sample No: **DD-BK-36-37-012518**

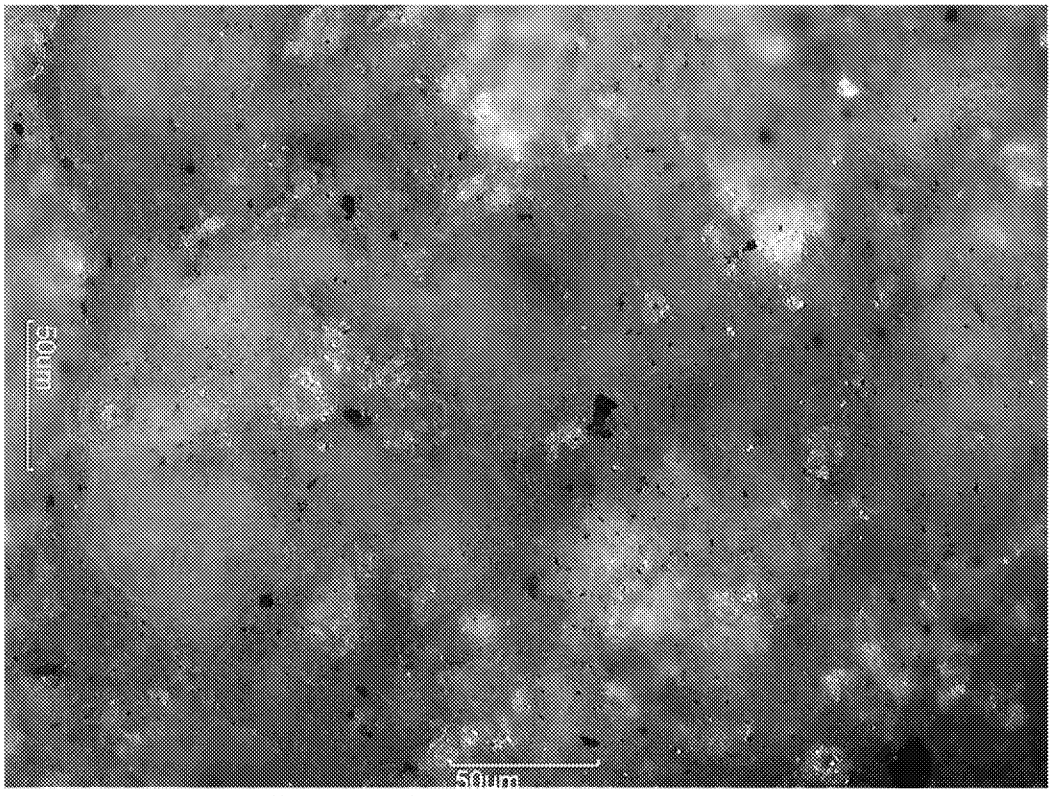
This sediment is tan in color with a reddish hue due to iron oxide staining. This sample was not analyzed by XRD per client request therefore, mineral identification and estimates are based solely on grain mounts and a polished billet. A standard thin section could not be prepared due to the high clay content. The polished billet was carbon coated and used for study by FE-SEM/EDS. Estimates of clay based on grain mounts and the polished billet indicate the clay concentration is ~45%. It is assumed the primary clay species is smectite followed by lesser amounts of kaolinite and illite based on other samples from this project analyzed by XRD. Quartz appears to be the primary silicate in a concentration of approximately 30-35%. Quartz occurs as well rounded to angular grains that vary greatly in size from fine to course silt (5μm-50μm) and very fine to fine sand (65μm-250μm). Like other samples, rounded grains of microcrystalline chert occur at around 1%. Approximately 12% of the sample is K-spar and plagioclase that appear to have equal ratios. The k-spar is mainly orthoclase and lesser amounts of grid twinned microcline and the plagioclase composition is albite to andesine. Small white to yellow grains seen in the bulk sample were removed and prepared as a grain mount in refractive index liquid and identified as plagioclase showing strong seritization. All feldspar contained in the sample ranges in size from silt to fine sand size. Calcite accounts for approximately 5-8% of the sample's volume and occurs as small individual grains ~2μm to 10μm in size and mixed with clay. A few carbonate forams are also present. Iron oxide accounts for approximately 2% and occurs as irregularly shaped masses and fine grains dispersed throughout the clay and as small pseudomorphs after pyrite framboids. Oxides of titanium and copper are present as a trace. Organic material occurs as small fragments up to 100μm and accounts for less than 1% of the sample. Barite identified by FE-SEM is present as a trace and occurs as thin seams in clay and small aggregates of tablet-like crystals. Sulfides are present as a trace and occur as minute grains of pyrite, galena, CuS and mixed grains composed of Cu, Zn, Sb and Pb. Of the samples in the study this material carries the highest concentration of native Au and some Ag. Several grains were identified included in clay with a grain size of less than 1μm up to 5μm. U content of this sample is 1ppm. An extensive search with backscatter imaging and analysis by EDS X-ray microanalysis on grains of interest failed to detect U in association with any mineral phases.



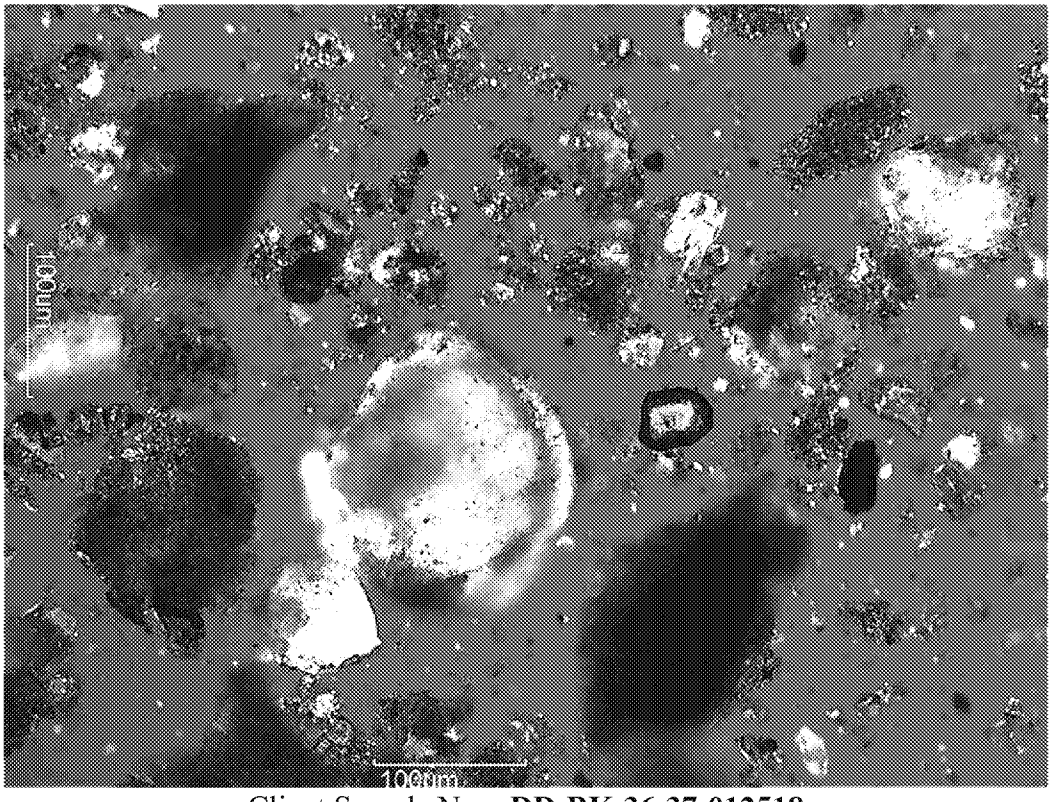
Client Sample No.: **DD-BK-36-37-012518**
Black organic material encased in a matrix of clay. Reflected light crossed Nichols – 200X



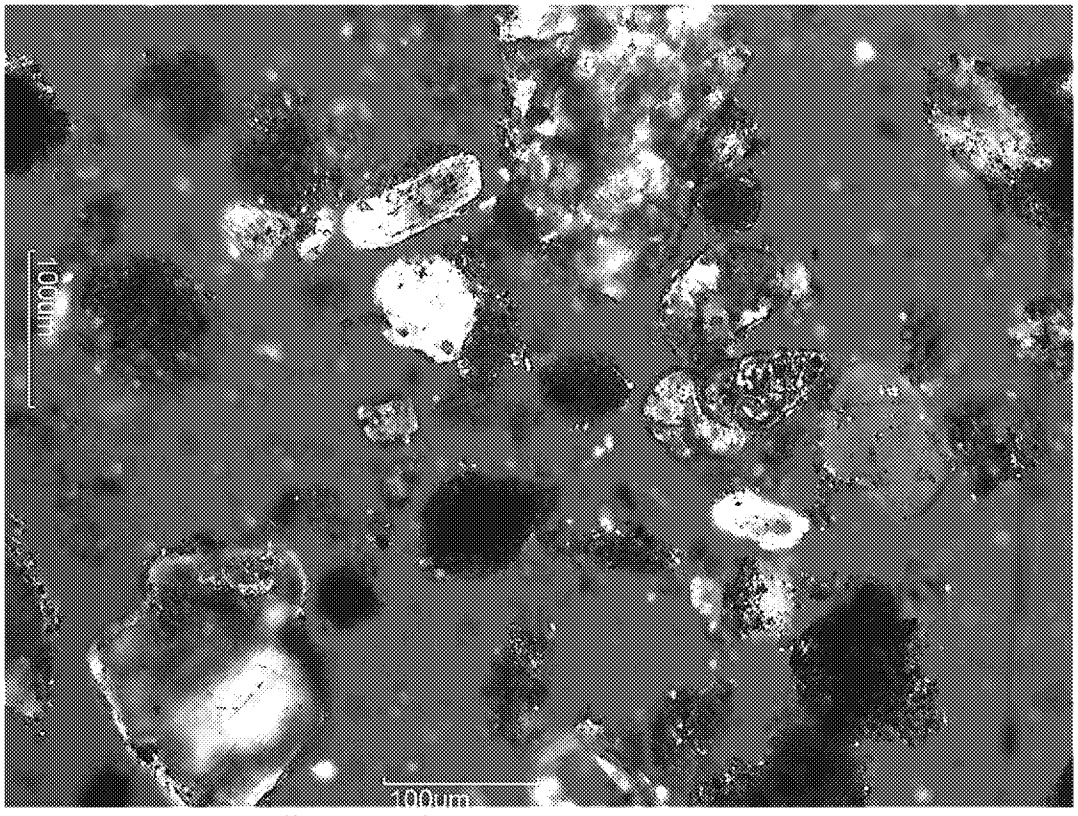
Client Sample No.: **DD-BK-36-37-012518**
Small grain of pyrite embedded in a matrix of iron stained clay. Reflected light – 500X.



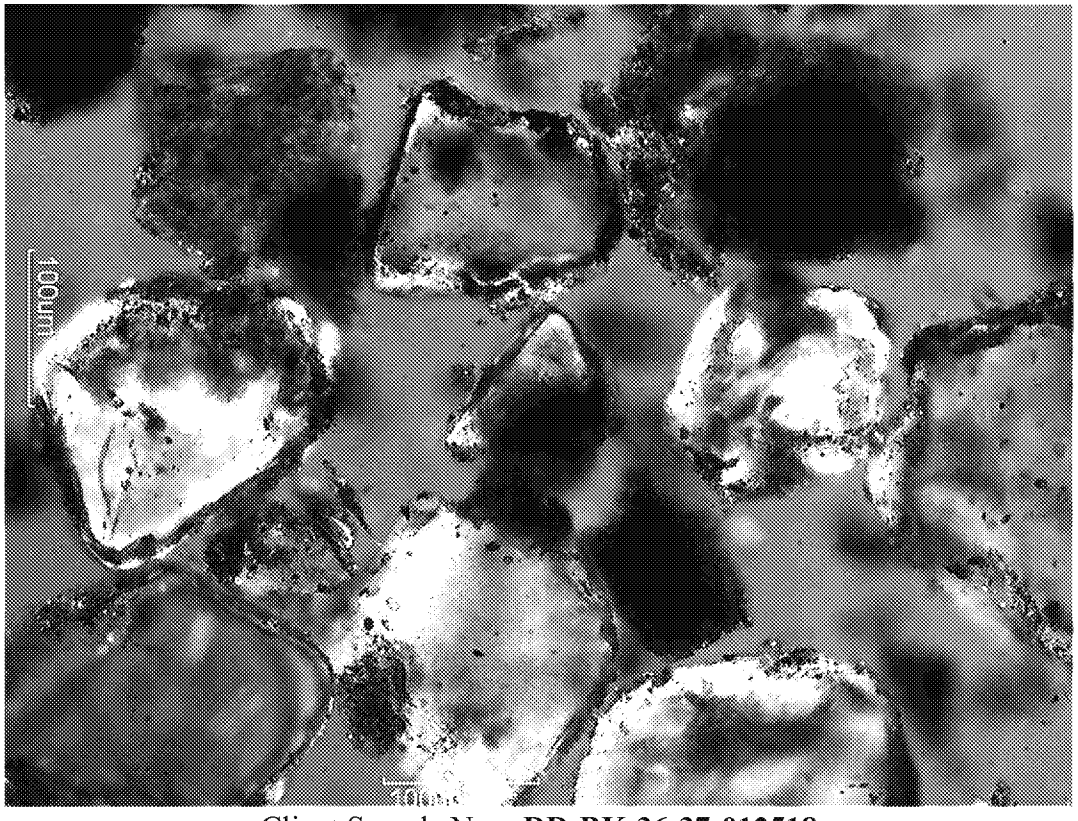
Client Sample No.: **DD-BK-36-37-012518**
Red iron stained clay with numerous inclusions of black organics. Reflected light crossed Nichols – 200X.



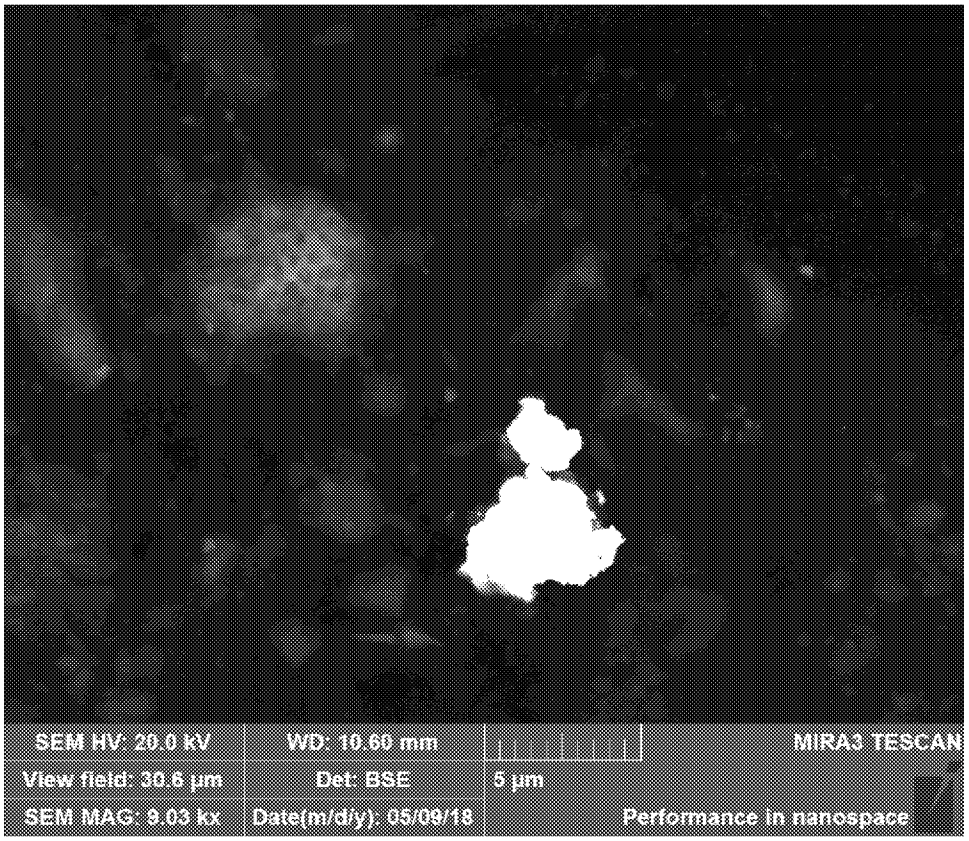
Client Sample No.: **DD-BK-36-37-012518**
Very fine sand to silt sized quartz/feldspar, colorful zircon and clay masses with opaque inclusions and fine-grained carbonate. Polarized light – 100X.



Client Sample No.: **DD-BK-36-37-012518**
Very fine sand to silt sized quartz/feldspar, dark clay masses with opaque inclusions and a carbonate foram. Polarized light – 100X.

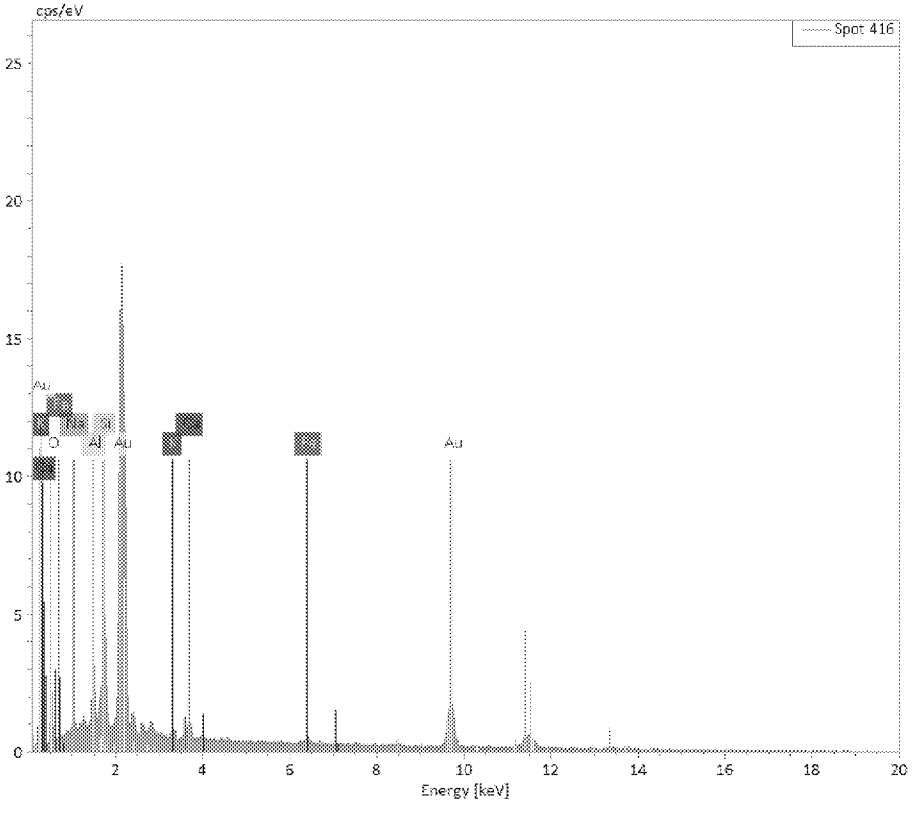


Client Sample No.: **DD-BK-36-37-012518**
Several sand sized quartz/feldspar grains and dark clay. Polarized light – 100X.



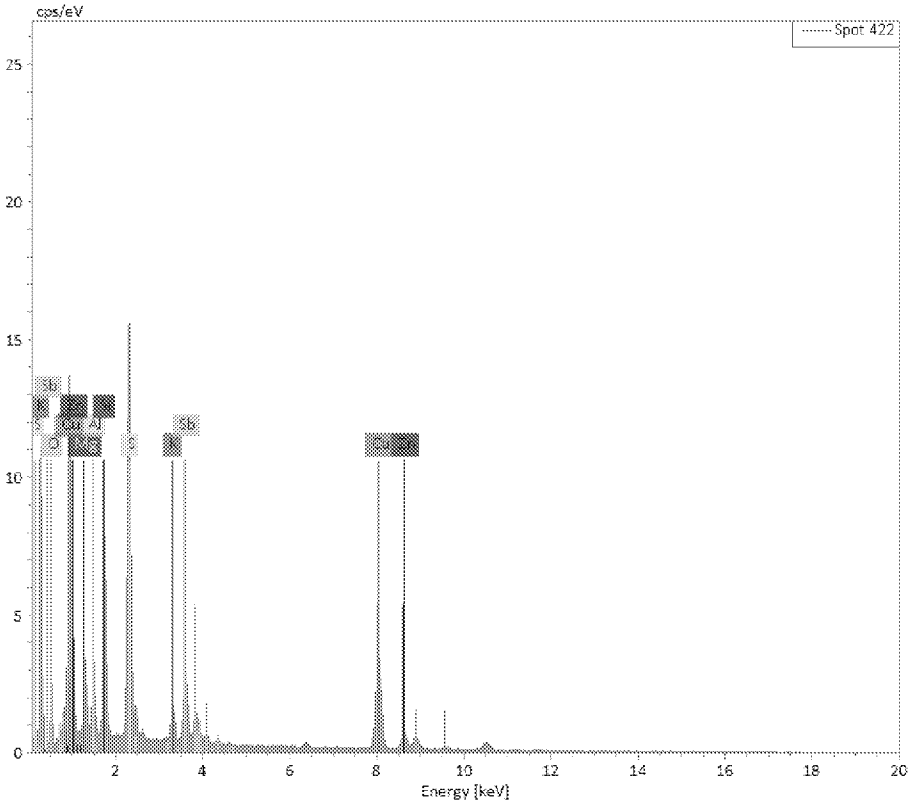
Client Sample No.: **DD-BK-36-37-012518**

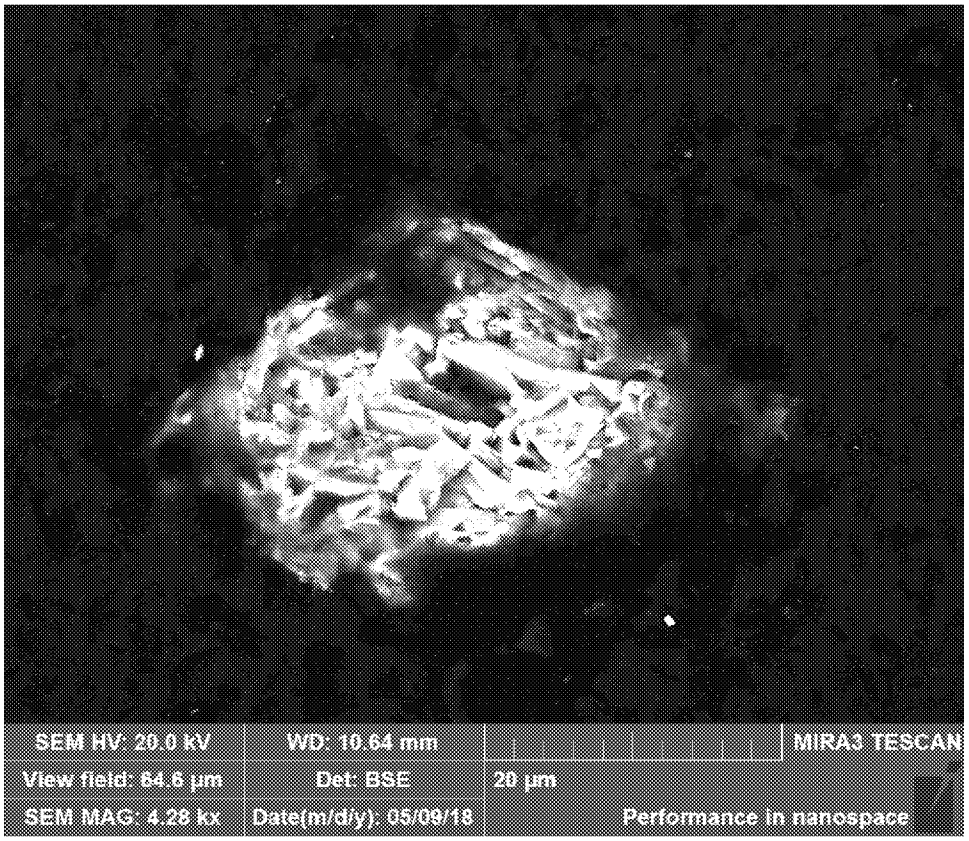
Backscatter image of bright Au in clay/silt. Upper left is an iron oxide pseudomorph after a pyrite framboid – 9,030X.



Client Sample No.: **DD-BK-36-37-012518**

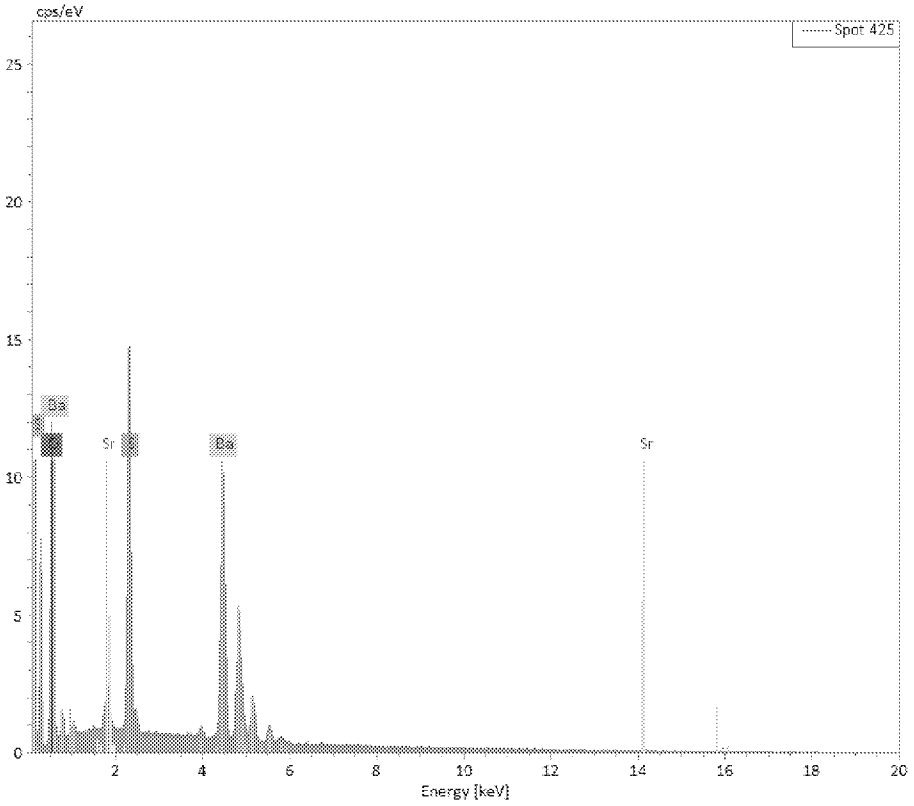
Backscatter image of an angular fragment of mixed metal sulfide in clay/silt – 15,000X.





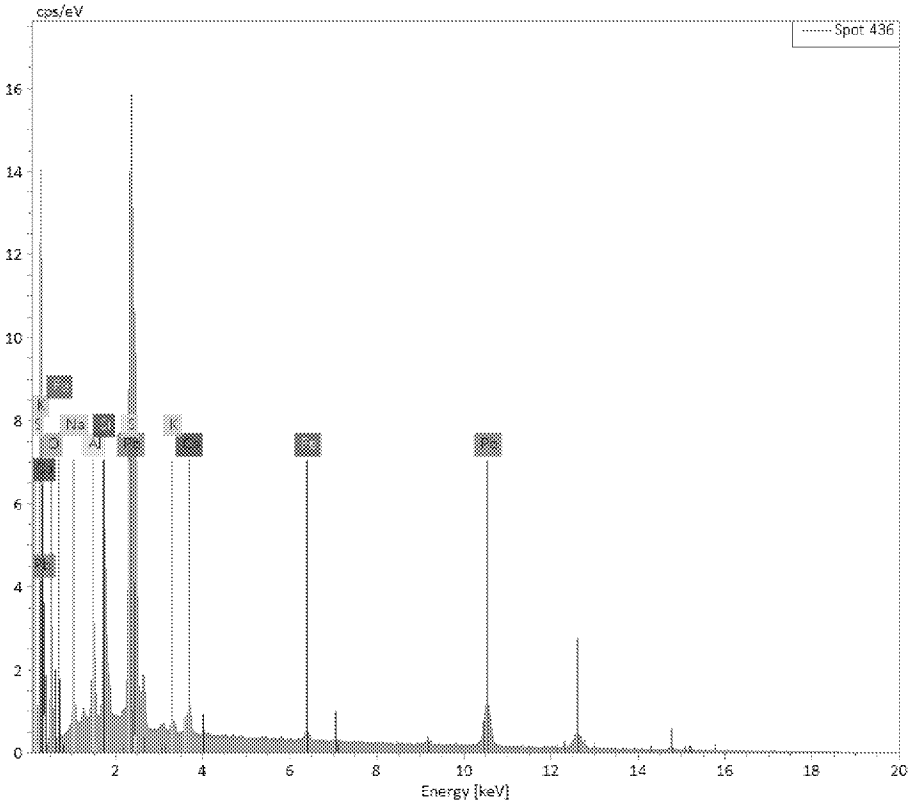
Client Sample No.: **DD-BK-36-37-012518**

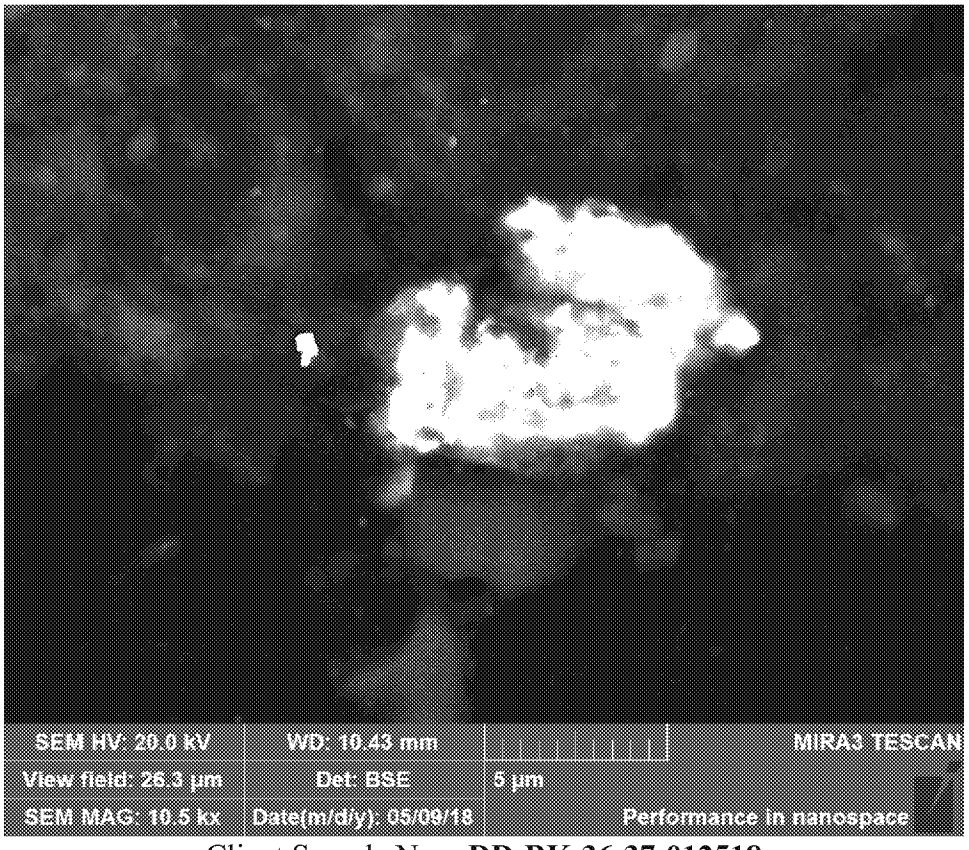
Backscatter image of barite in clay showing individual tablets – 4,280X.



Client Sample No.: **DD-BK-36-37-012518**

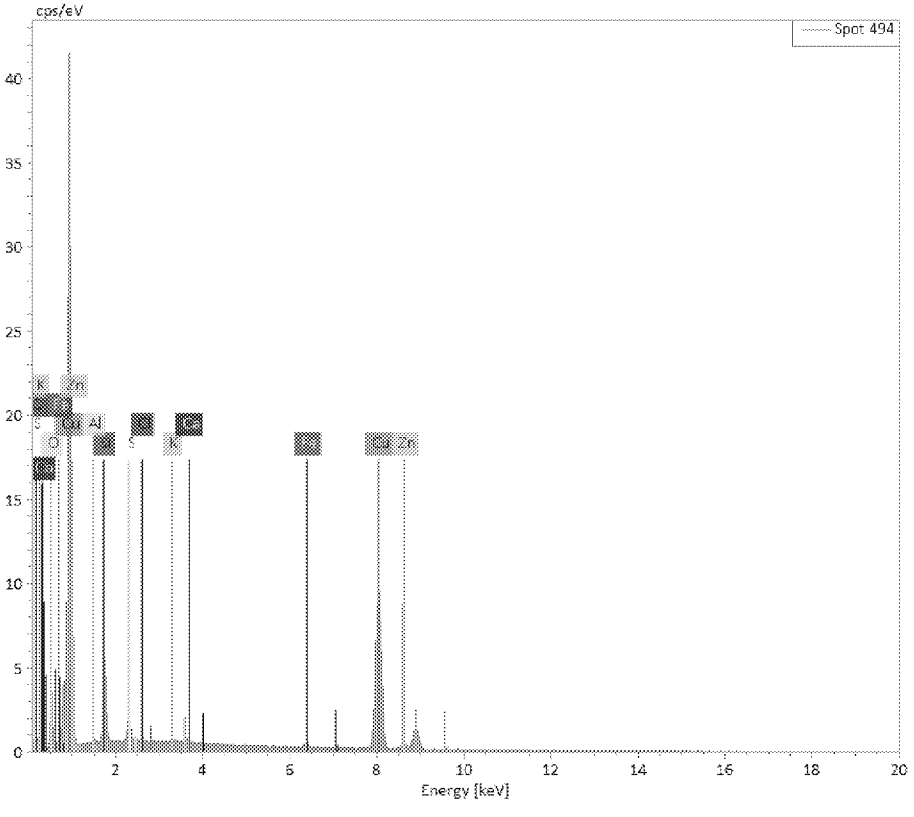
Backscatter image of minute lead sulfide grains in clay – 13,100X.

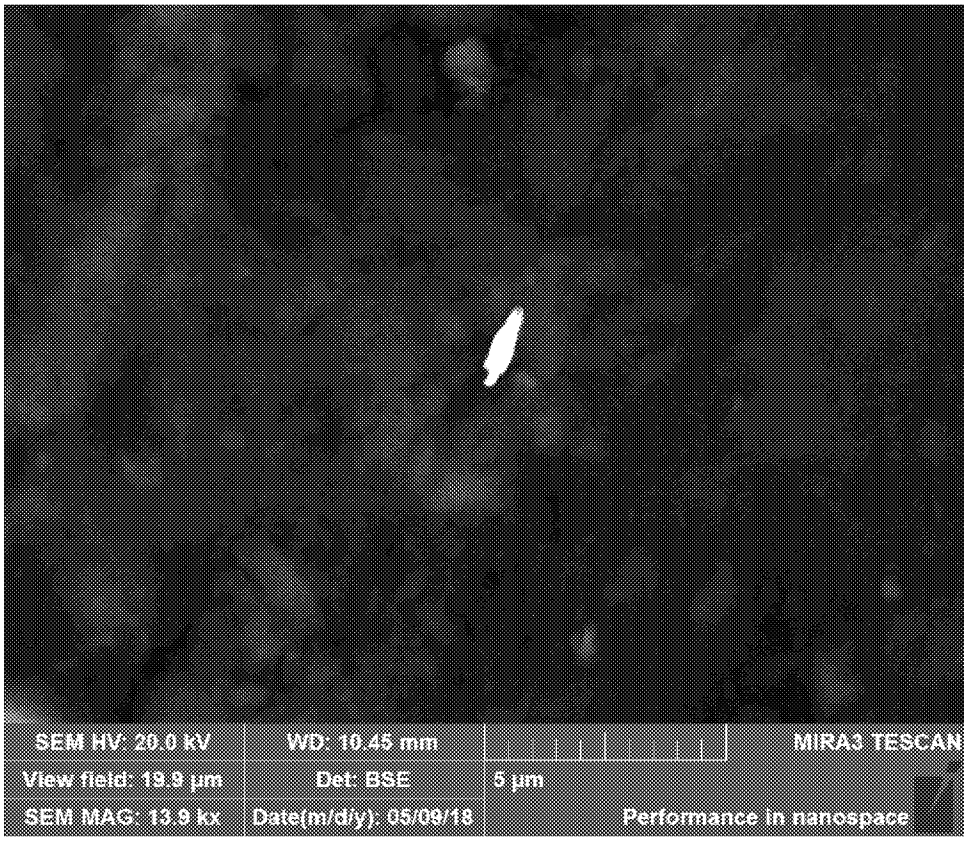




Client Sample No.: **DD-BK-36-37-012518**

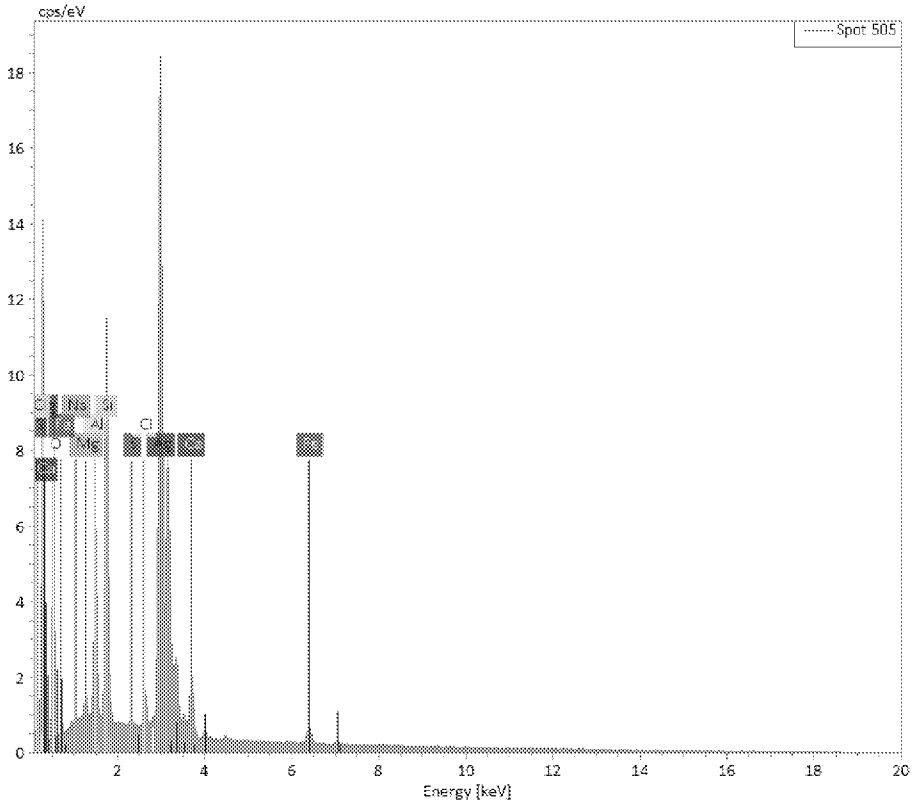
Backscatter image of copper oxide and a small bright grain of Au to the left in a mass of clay/silt – 10,500X.





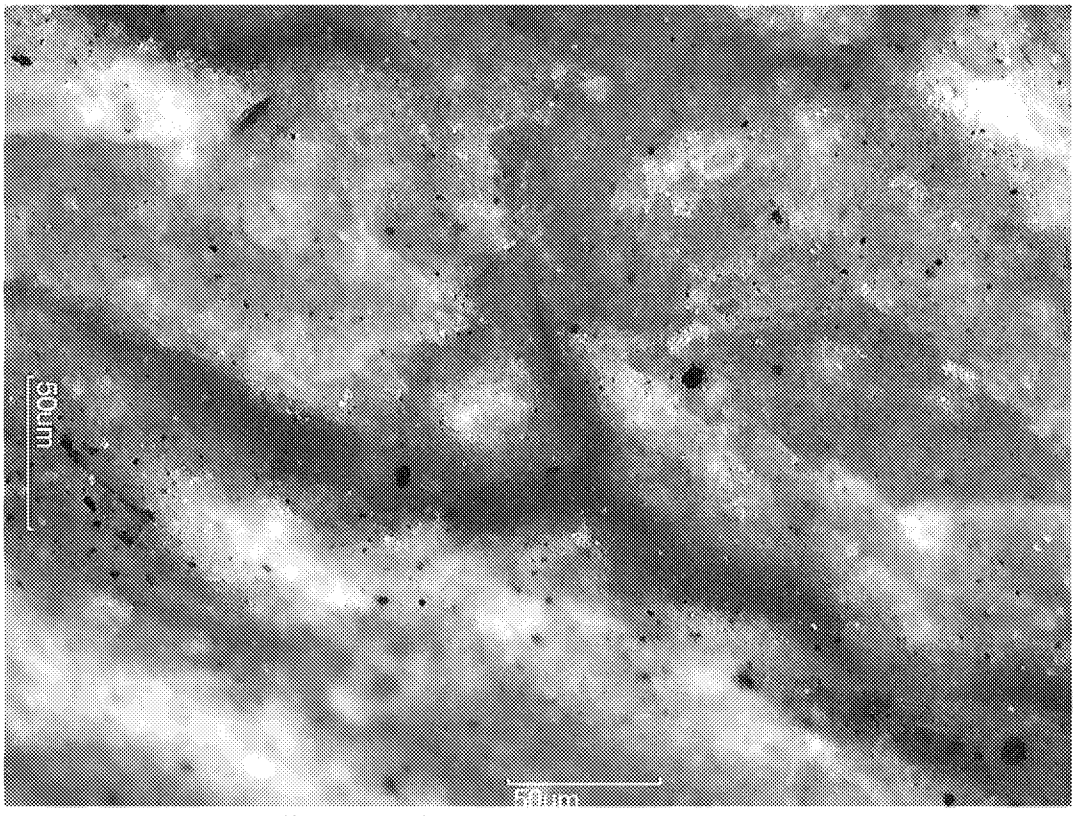
Client Sample No.: **DD-BK-36-37-012518**

Backscatter showing a bright sliver of native Ag in a clay mass – 13,900X.



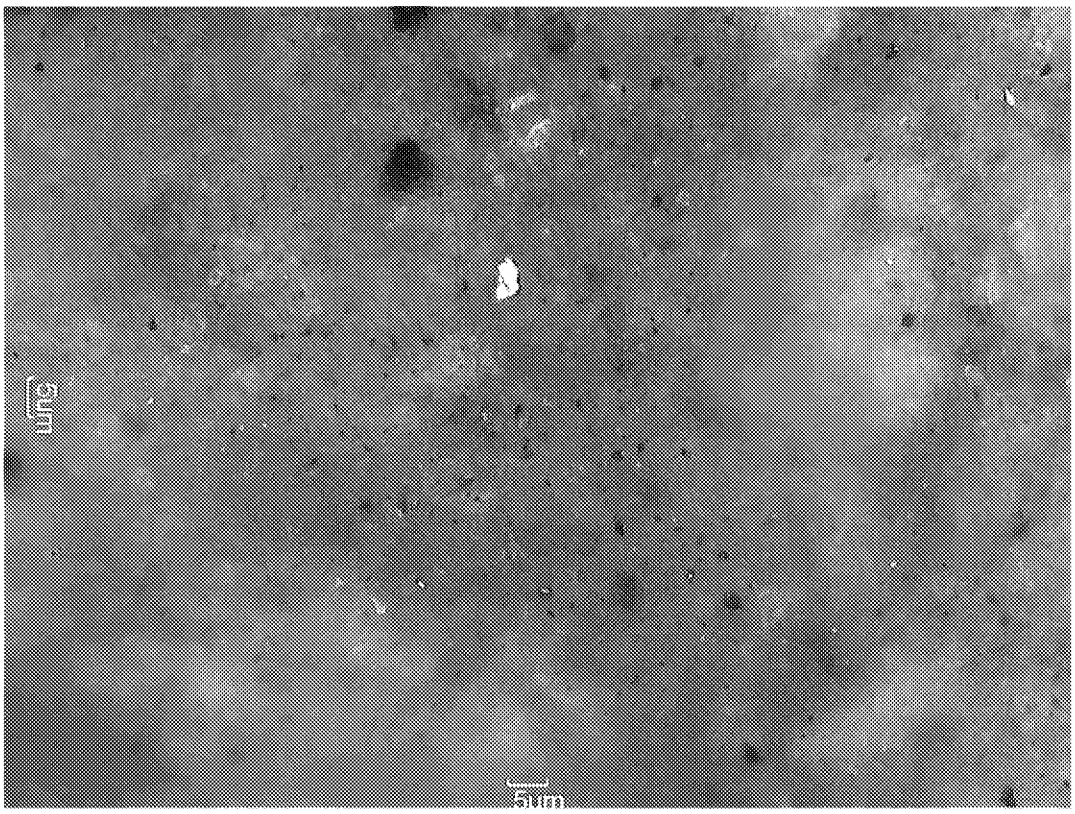
Client Sample No: **DD-BK-58-59-012618**

This sediment is brownish red in color due to iron oxide. The sample was not analyzed by XRD per client request. Therefore, mineral identification and estimates are based solely on grain mounts and a polished billet. A standard thin section could not be prepared due to the high clay content. The polished billet was carbon coated and used for study by FE-SEM/EDS. Estimates of clay based on grain mounts and the polished billet indicate the clay concentration is similar to sample **DD-BK-36-37-012518** at ~40% to 45%. Like the previous sample, it is assumed the primary clay species is smectite followed by lesser amounts of kaolinite and illite based on other samples from this project analyzed by XRD. Quartz is the primary silicate with a concentration of approximately 30-35%. Quartz occurs as well rounded to angular grains that vary greatly in size from fine to coarse silt (5μm-50μm) and very fine to fine sand (65μm-250μm). Dirty looking rounded grains of microcrystalline chert occur at around 1%. Angular to sub-rounded plagioclase with a bulk composition of albite to andesine is present in a concentration of around 6% to 8%. Grain size varies from silt to fine sand. Angular to sub-rounded, cloudy looking orthoclase and clear microcline have a grain size that varies from silt to very fine sand and a concentration of 4% to 6%. Calcite accounts for approximately 5-8% of the sample's volume and occurs as small individual grains ~2μm to 100μm in size and mixed with clay. A trace of barite largely confined to clay with a grain size up to 20μm was identified by FE-SEM/EDS. Iron oxide concentration is estimated at around 2% of the sample's volume. Although it is largely seen as minute red grains finely disseminated throughout the clay, a few irregularly shaped clots and thin seams cross cut clay masses. Minute grains of rutile, magnetite and oxides of Cu, Sn, and Zn were identified by FE-SEM/EDS. Rare earth phosphates and a Pb phosphate are present as a trace. Sulfides are present as a trace and are represented by several types. Pyrite is the most common followed by stibnite, sphalerite, chalcopyrite, Cu sulfide and galena. Sulfide grain size varies from 2μm to 5μm in size. In addition, a few small grains of native Au and Ag were identified. An extensive search and analysis by EDS X-ray microanalysis of clays, iron oxide and carbon fragments failed to detect adsorbed or discrete U phases.



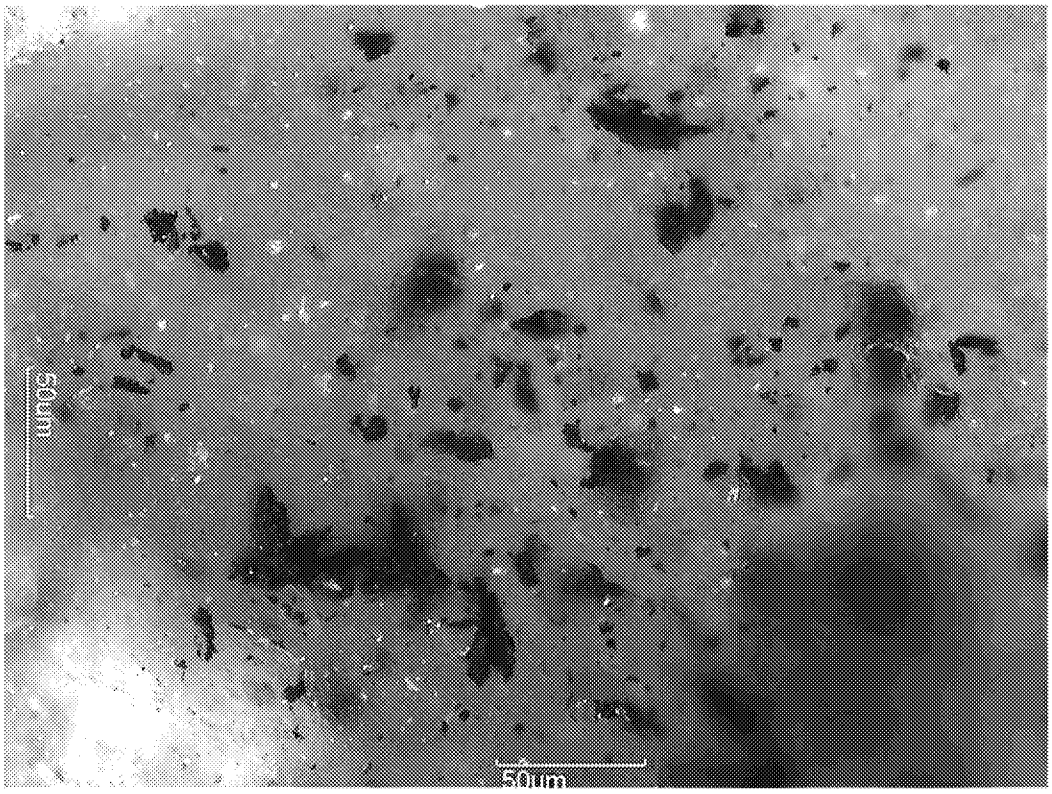
Client Sample No.: **DD-BK-58-59-012618**

Thin seams of iron stained clay crosscuts lighter colored clay. Reflected light crossed Nichols – 200X.

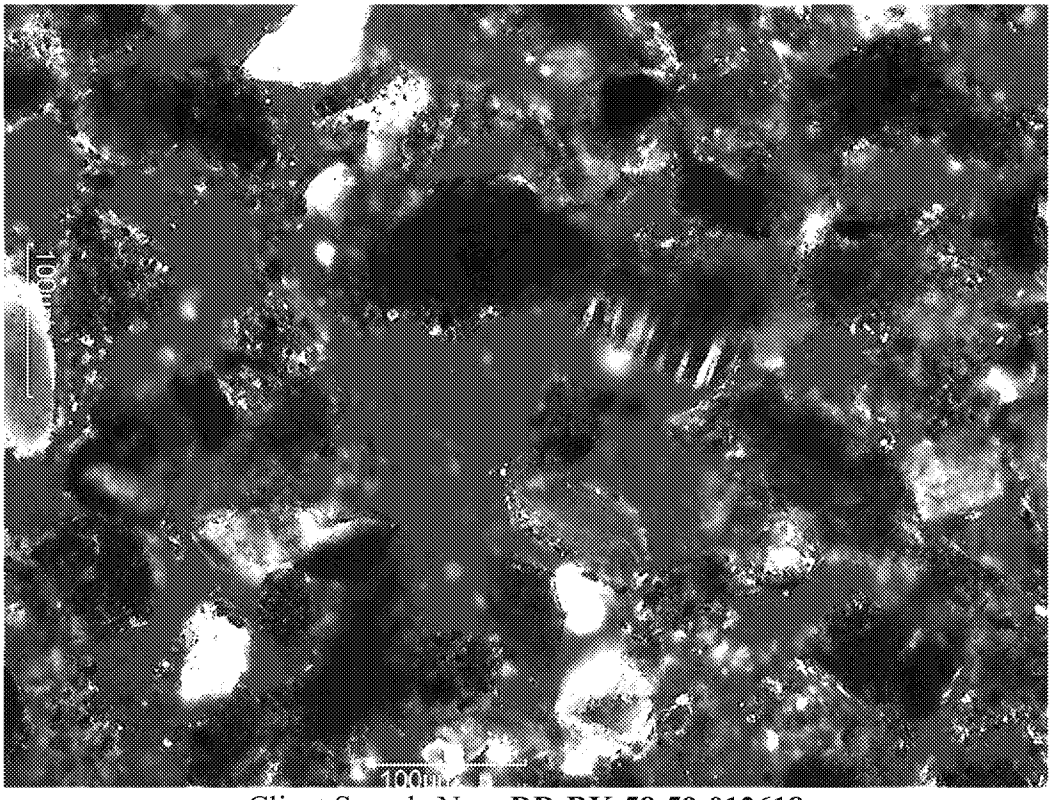


Client Sample No.: **DD-BK-58-59-012618**

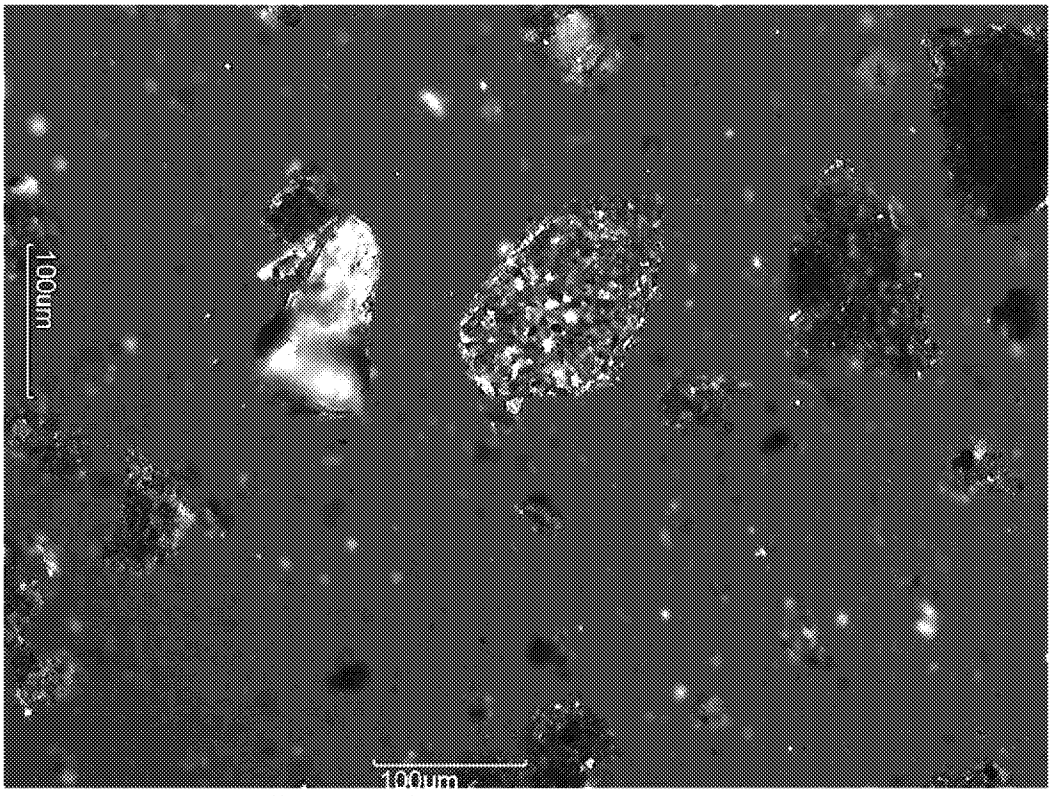
Bright grain of pyrite and black organics in a matrix of iron stained clay. Reflected light – 500X.



Client Sample No.: **DD-BK-58-59-012618**
Translucent iron stained clay with numerous black organics. Reflected light crossed Nichols – 200X.

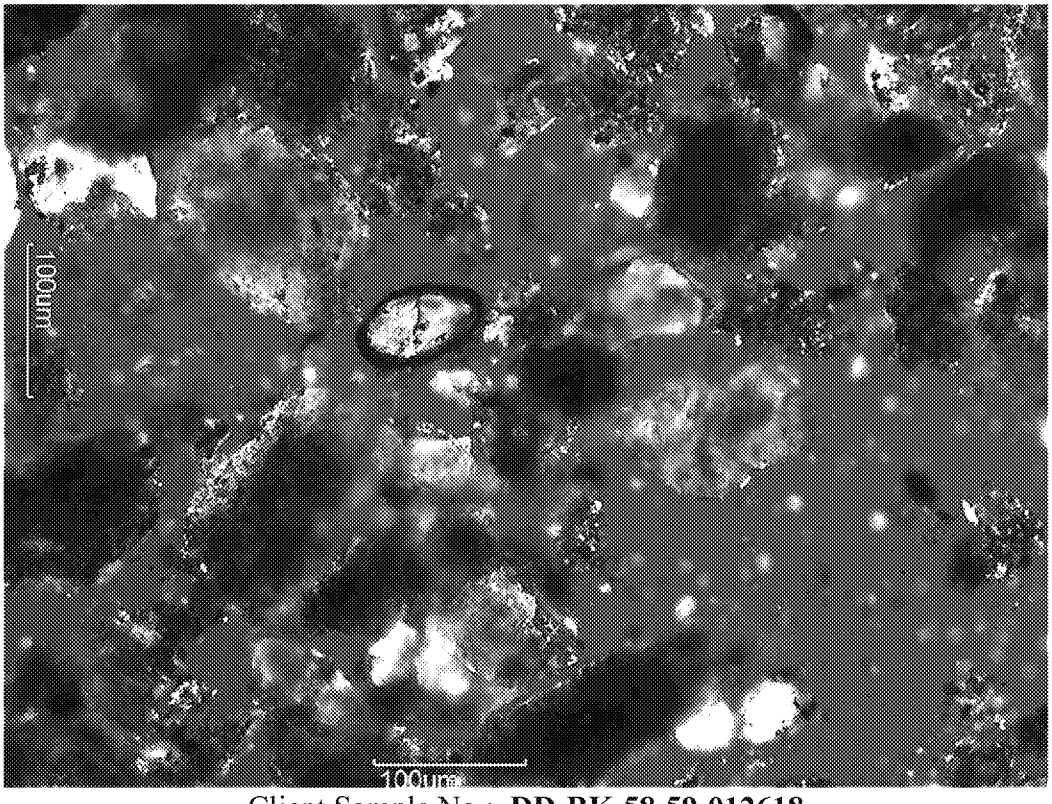


Client Sample No.: **DD-BK-58-59-012618**
Very fine sand to silt sized quartz/feldspar, calcite and clay masses with opaque inclusions. Polarized light – 100X.



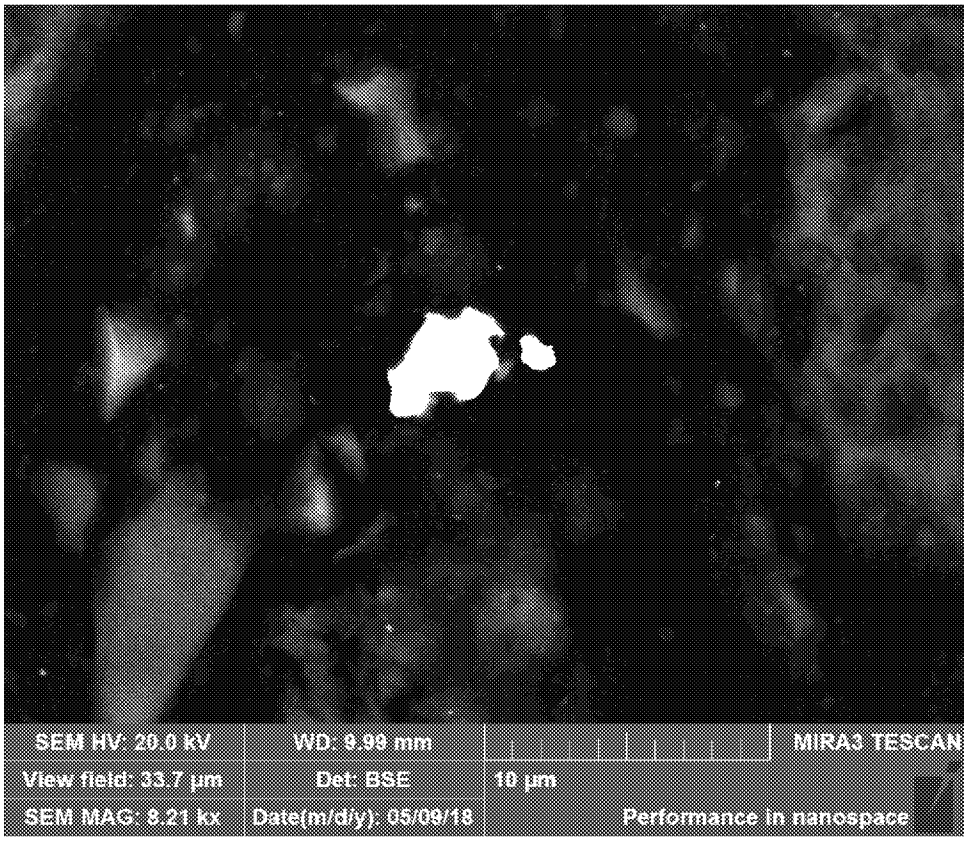
Client Sample No.: **DD-BK-58-59-012618**

Chert in the center is flanked by calcite to the left and dark clay to the right. Polarized light – 100X.



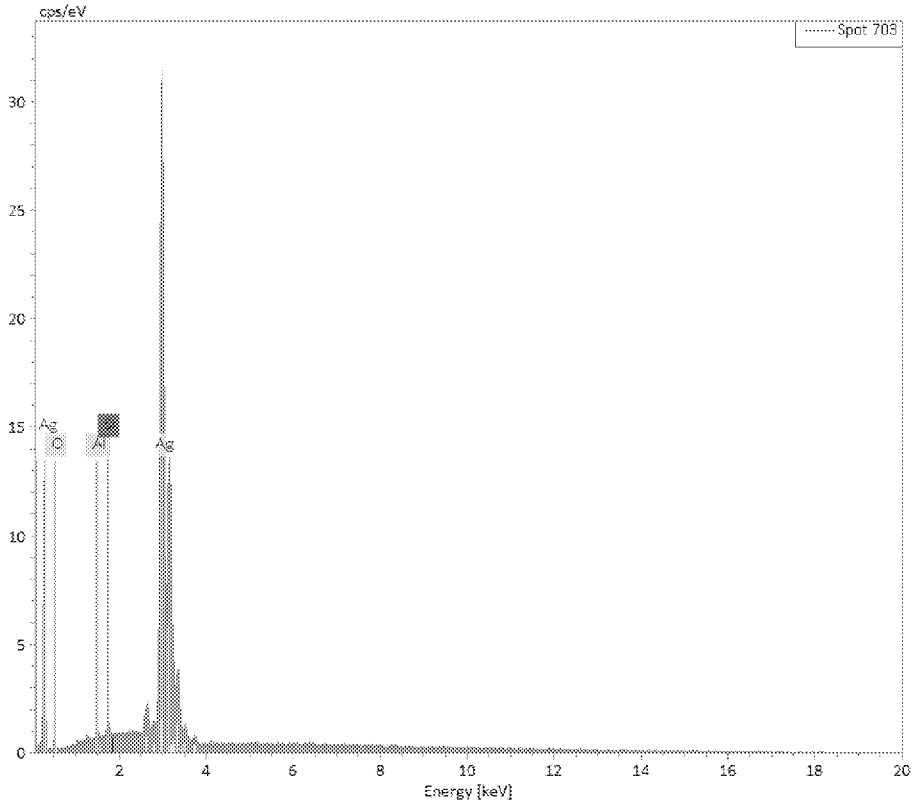
Client Sample No.: **DD-BK-58-59-012618**

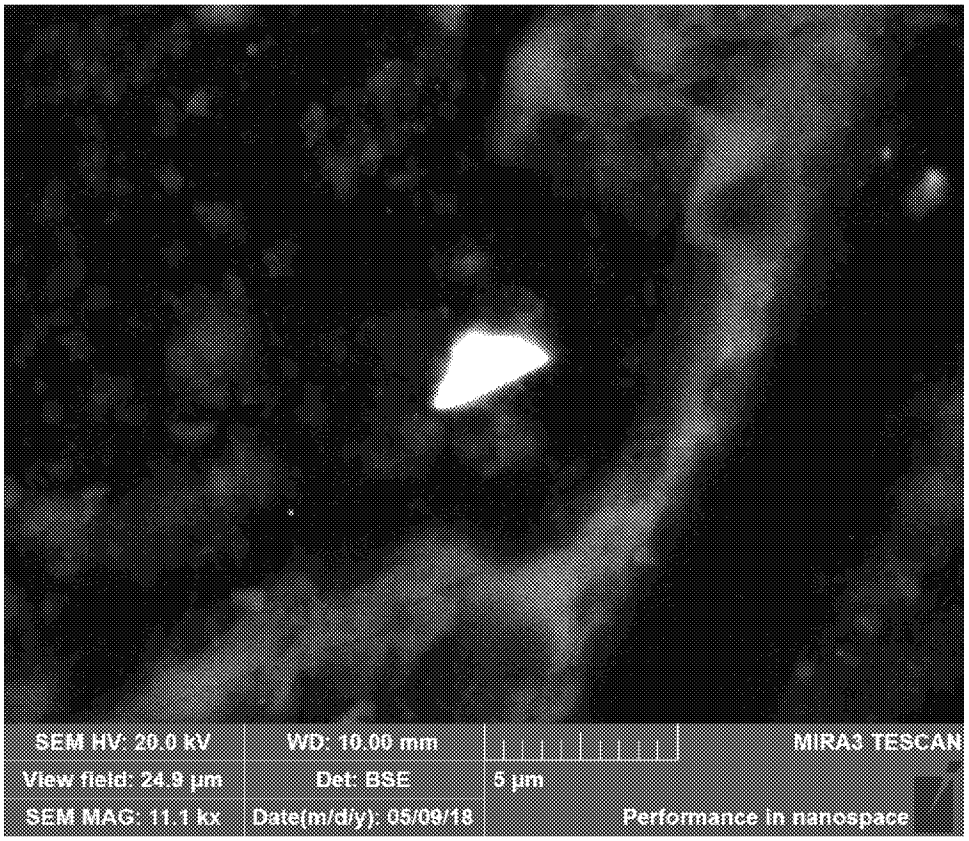
Very fine sand to silt sized quartz/feldspar, colorful zircon, clay masses with opaque inclusions and some fine-grained carbonate. Polarized light – 100X.



Client Sample No.: **DD-BK-58-59-012618**

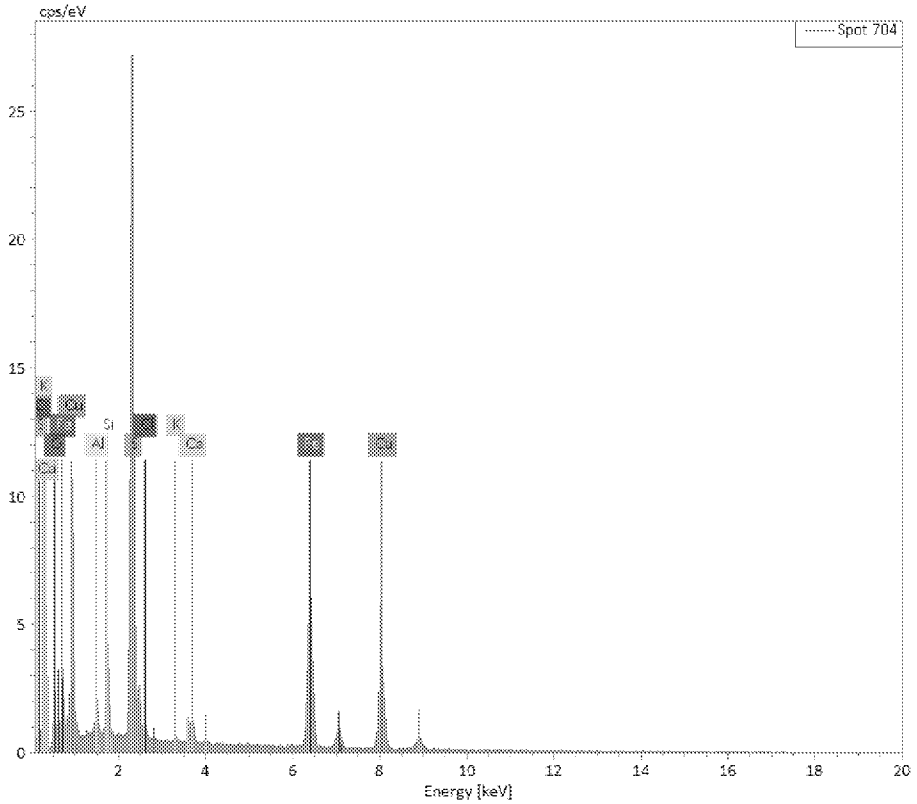
Backscatter image of two small grains of native Ag in a clay/silt matrix – 8,210X.

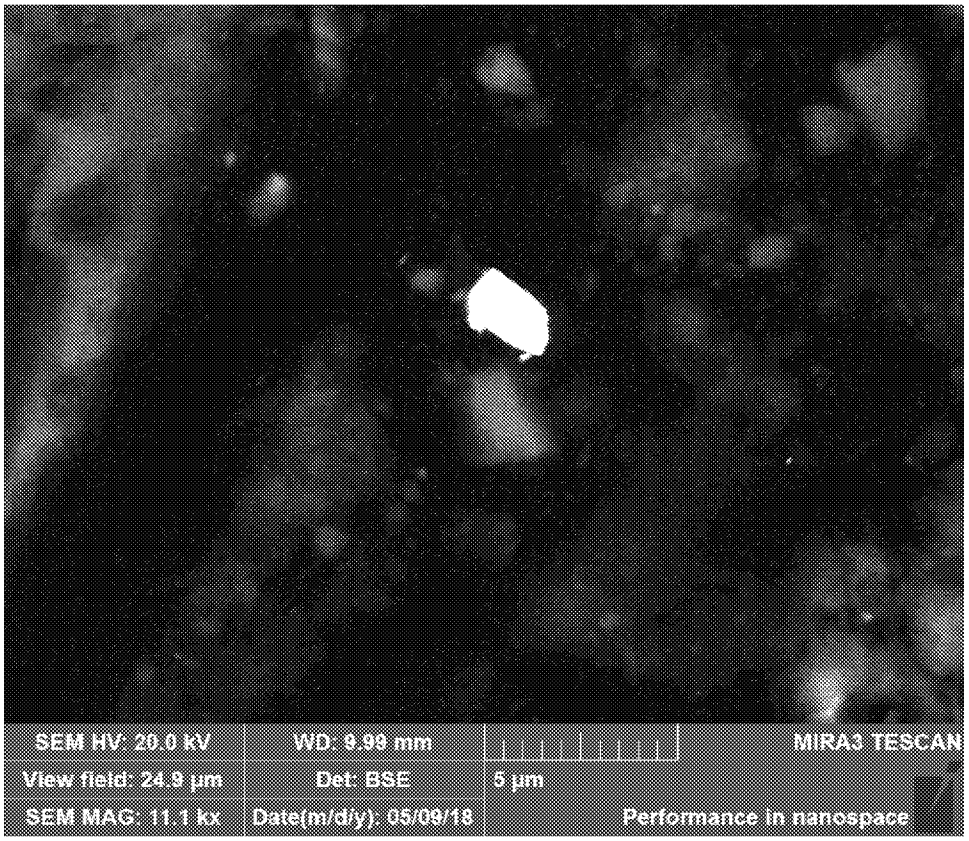




Client Sample No.: **DD-BK-58-59-012618**

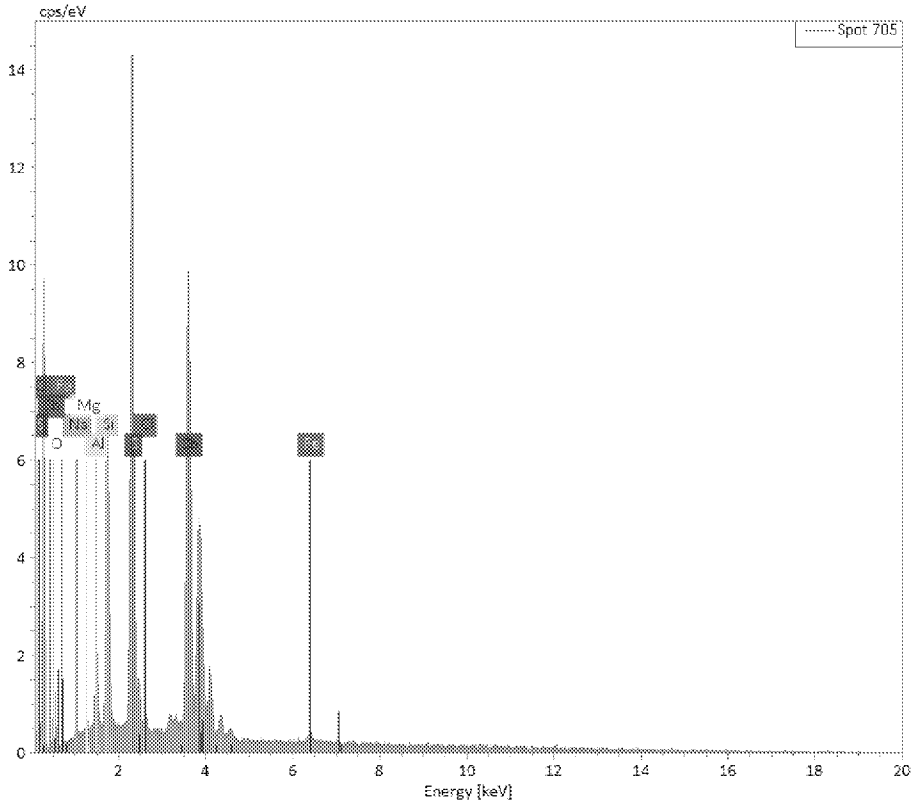
Backscatter image of clay with a small fragment of chalcopyrite – 11,100X.

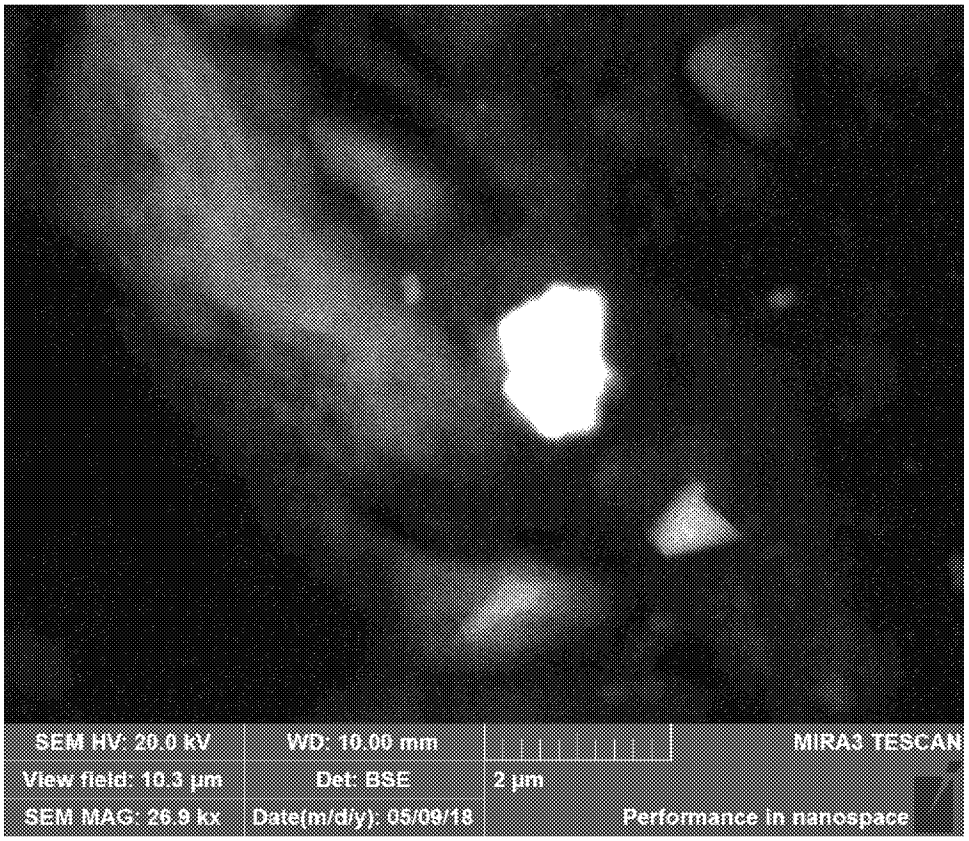




Client Sample No.: **DD-BK-58-59-012618**

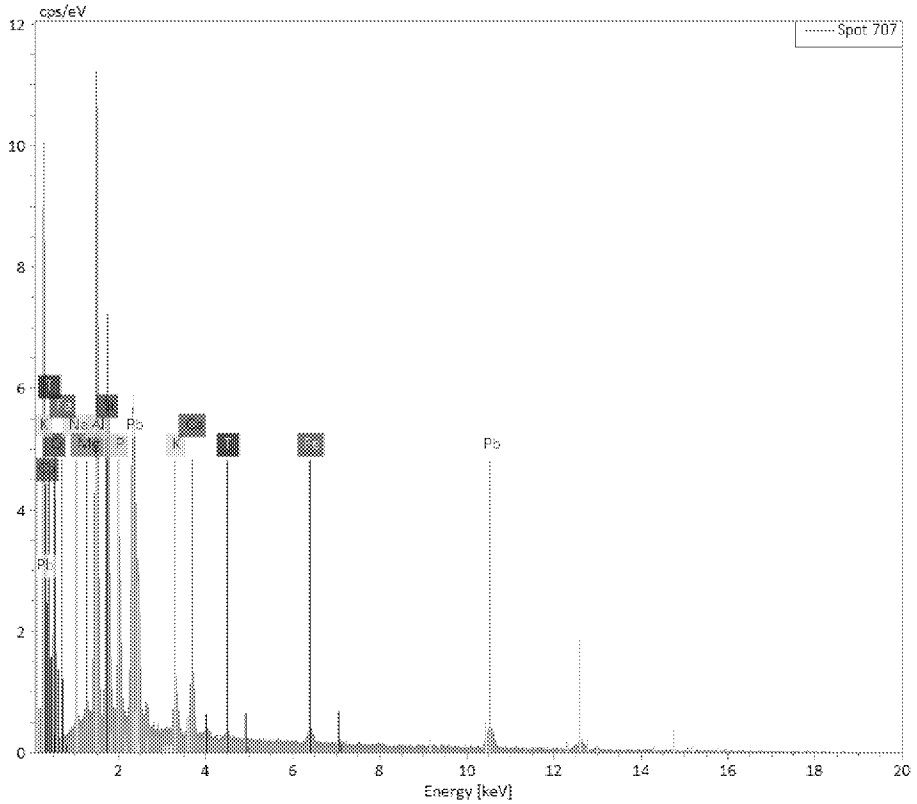
Backscatter image of clay/silt with a small angular fragment of antimony sulfide – 11,100X.

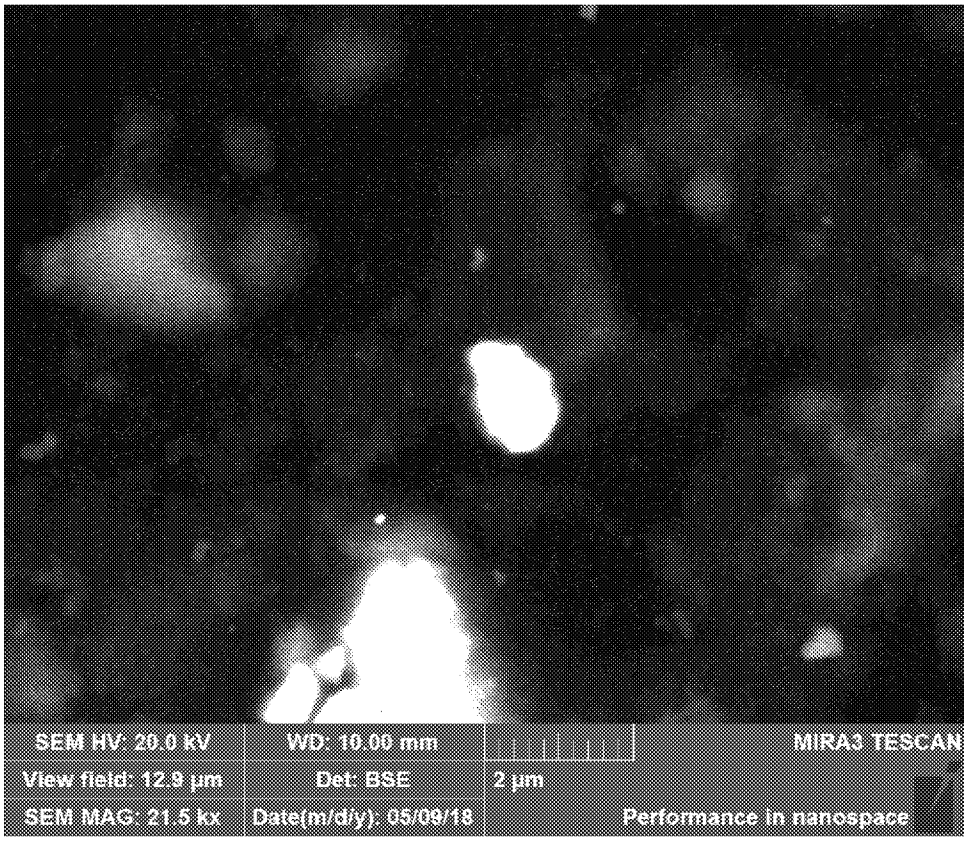




Client Sample No.: **DD-BK-58-59-012618**

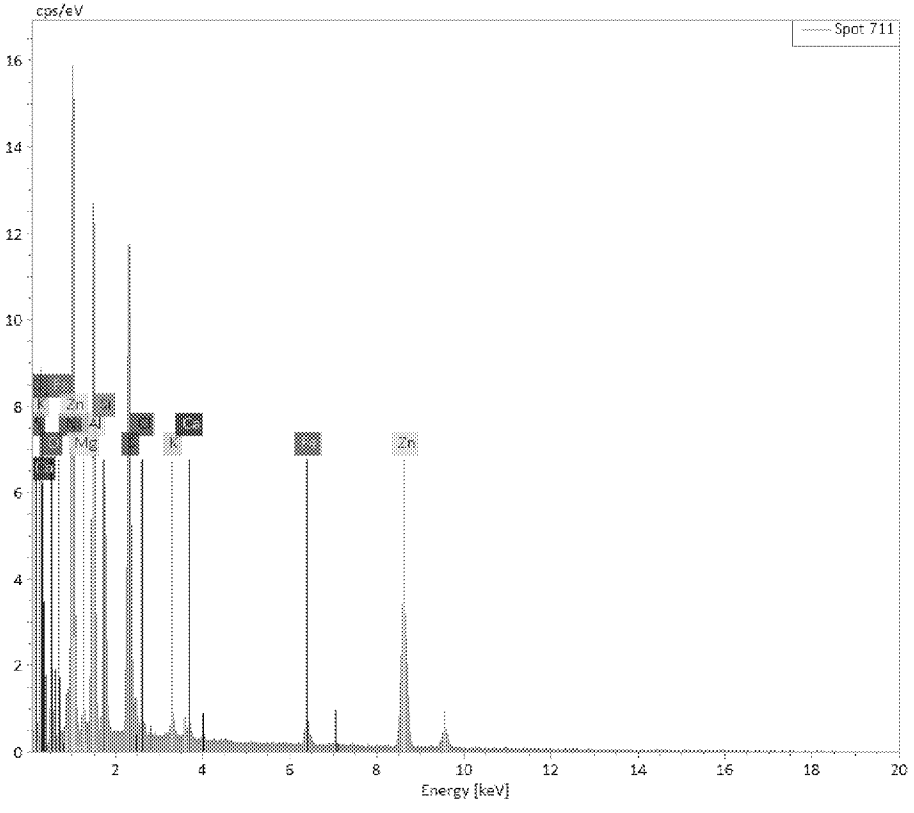
Backscatter image of clay/silt with a small fragment of lead phosphate – 26,900X.





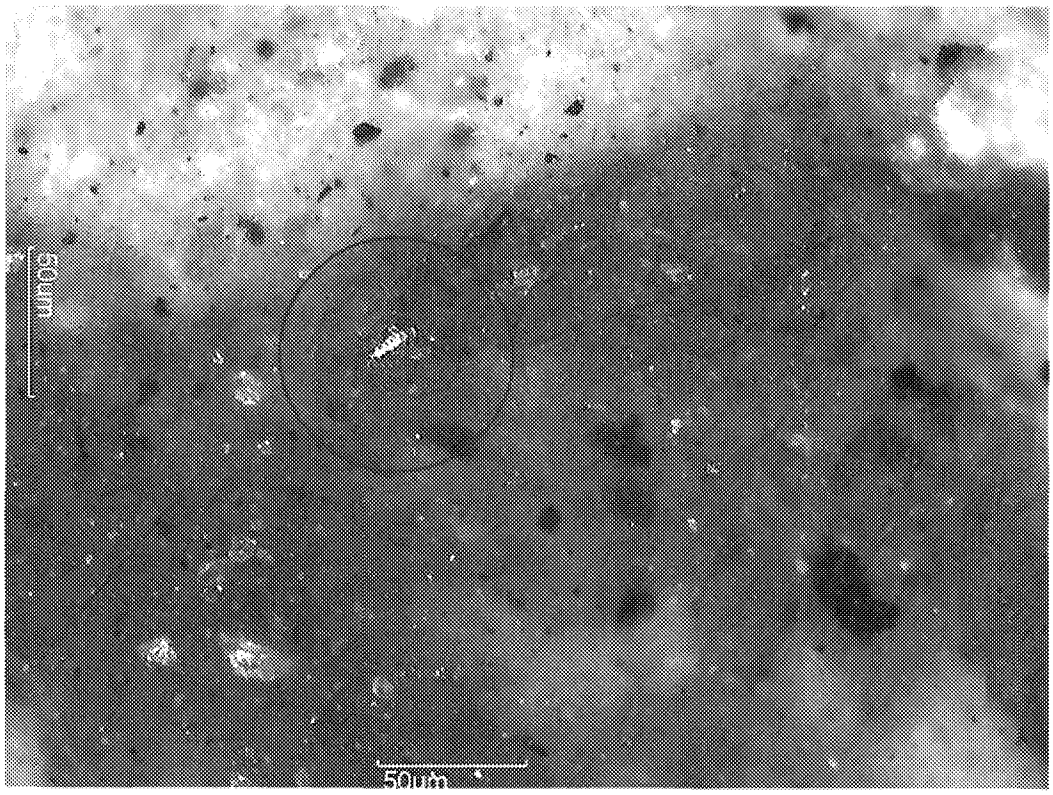
Client Sample No.: **DD-BK-58-59-012618**

Backscatter image of clay/silt with a small fragment of sphalerite. Large bright grain below is iron oxide – 21,500X.



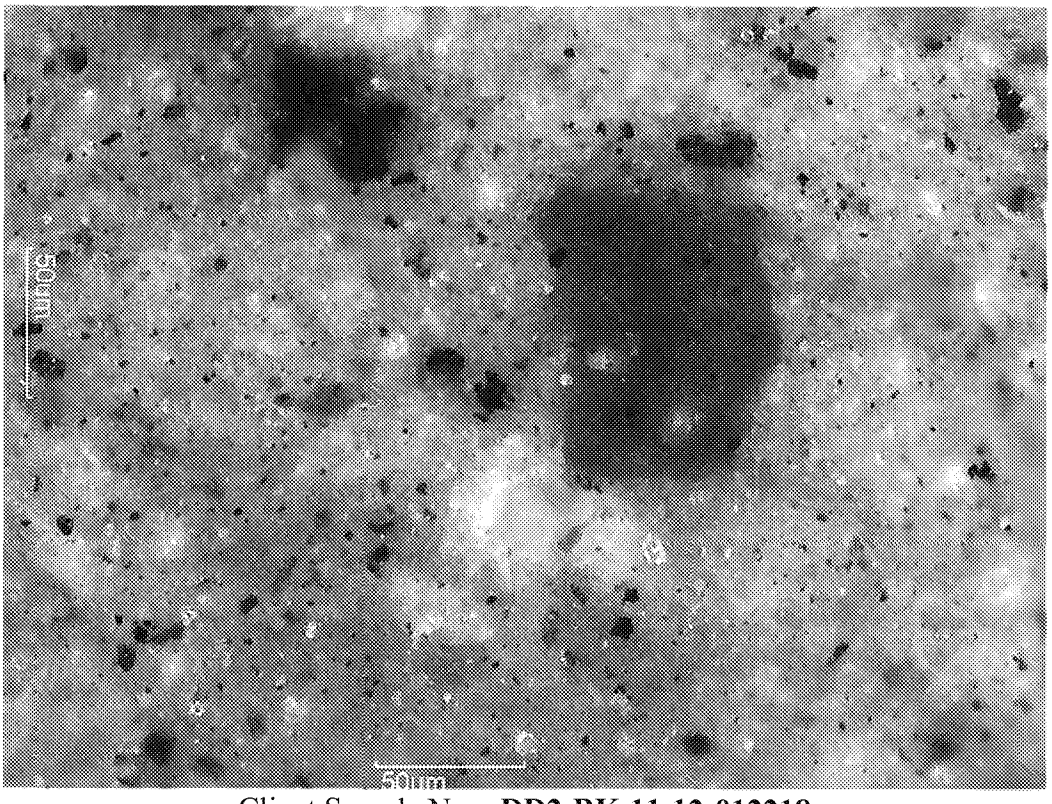
Client Sample No: **DD2-BK-11-12-012218**

This sample is a brown sediment composed of greater than 50% clay by mass. Due to the high clay content a standard thin section could not be prepared, therefore, reflected light microscopy was performed on a polished billet and transmitted light microscopy was achieved using grain mounts. The polished billet was carbon coated and used for study by FE-SEM/EDS. XRD phase analysis indicates the clay is primarily swelling smectite (~26%) followed by lesser amounts of kaolinite (~23%) and illite (~7%). In transmitted light the clay has a dirty appearance due to small black organic inclusions. Approximately 37% of the sample's mass is composed of quartz and feldspar. Quartz (~26%) occurs as well rounded to angular grains that vary greatly in size from fine to coarse silt (5μm-50μm) and very fine to fine sand (65μm-250μm). Approximately 1% of the silica is in the form of rounded, dirty looking microcrystalline chert riddled with opaque inclusions. Plagioclase and potassium feldspar are present in similar amounts. Plagioclase (~6%) occurs as angular to sub-rounded grains that vary from silt to fine sand size. Refractive index studies indicate an albite to andesine composition. Some of the plagioclase shows the effects of mild seritization. Potassium feldspar (~5%) is angular to sub-rounded with a similar size range as the plagioclase. Although most of the K-spar is cloudy looking orthoclase, clear grains of microcline are present. Other silicates include a trace of zircon, amphibole and brown mica. Calcite is present in low amounts (~7%) and occurs as fine-grained aggregates, minute grains mixed with clay or as individual grains up to 100μm. Although iron oxide compounds were not detected by XRD visual estimates are approximately 1%. The oxide occurs as minute disseminated grains in clay and small irregularly shaped clots up to 50μm. FE-SEM/EDS also detects titanium oxide in the form of rutile, ilmenite and leucoxene. Sulfides are present as a trace and include pyrite, galena and sphalerite with a grain size up to 5μm. Other trace phases identified by FE-SEM/EDS include rare earth phosphates, strontium/barium sulfate and a few grains of Au. This sample contains the highest level of U at 10ppm. A thorough search using backscatter imaging and EDS x-ray microanalysis of numerous particles including iron oxide, carbon and other particles of interest failed to detect U.



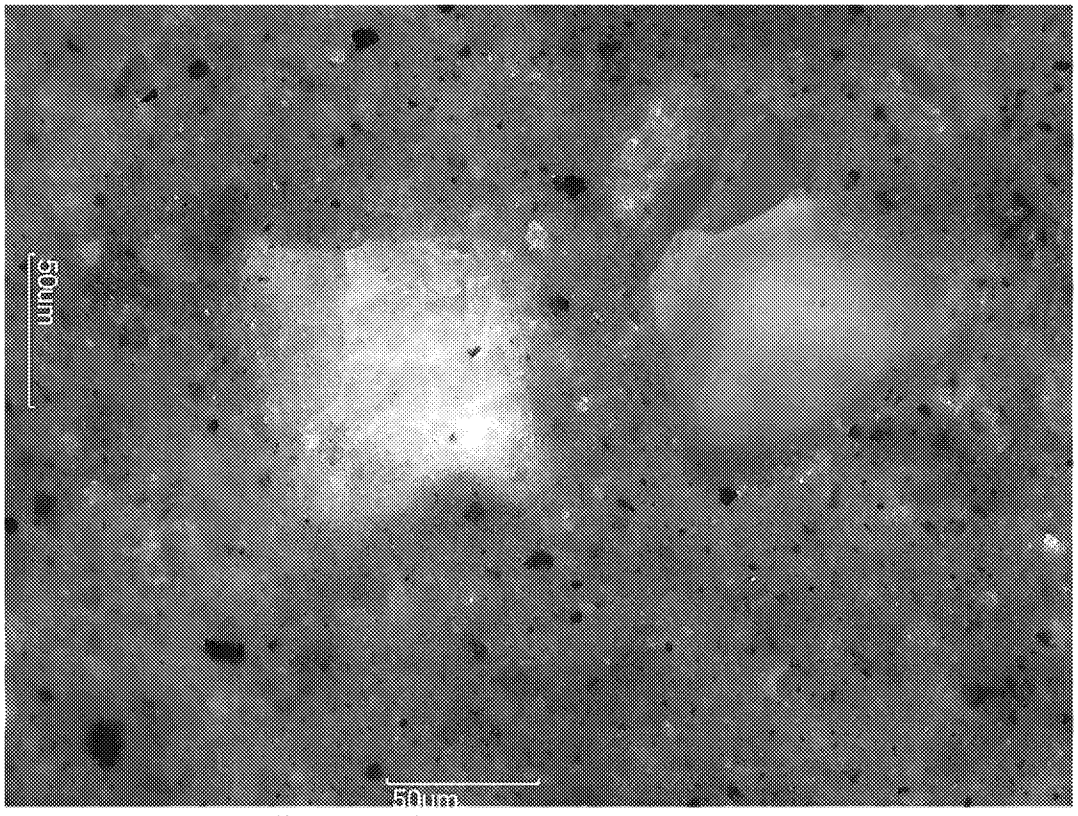
Client Sample No.: **DD2-BK-11-12-012218**

A small grain of yellow pyrite and numerous black organics in iron stained clay. Reflected light – 500X.

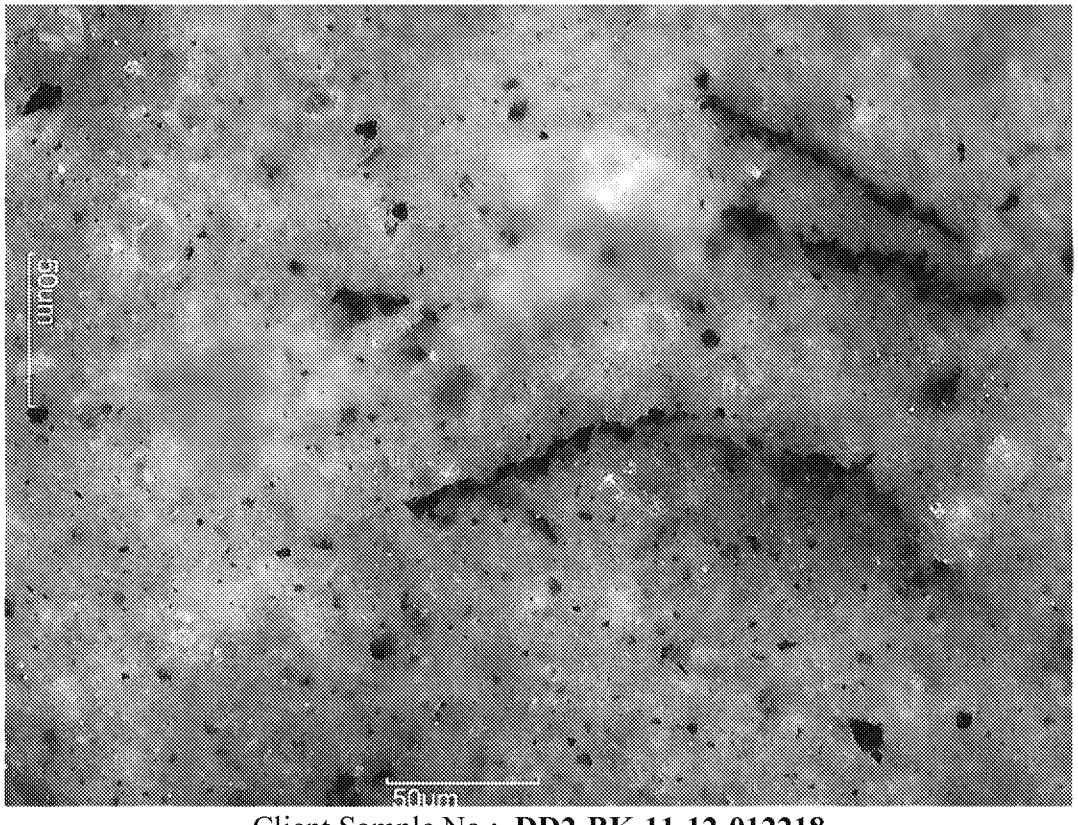


Client Sample No.: **DD2-BK-11-12-012218**

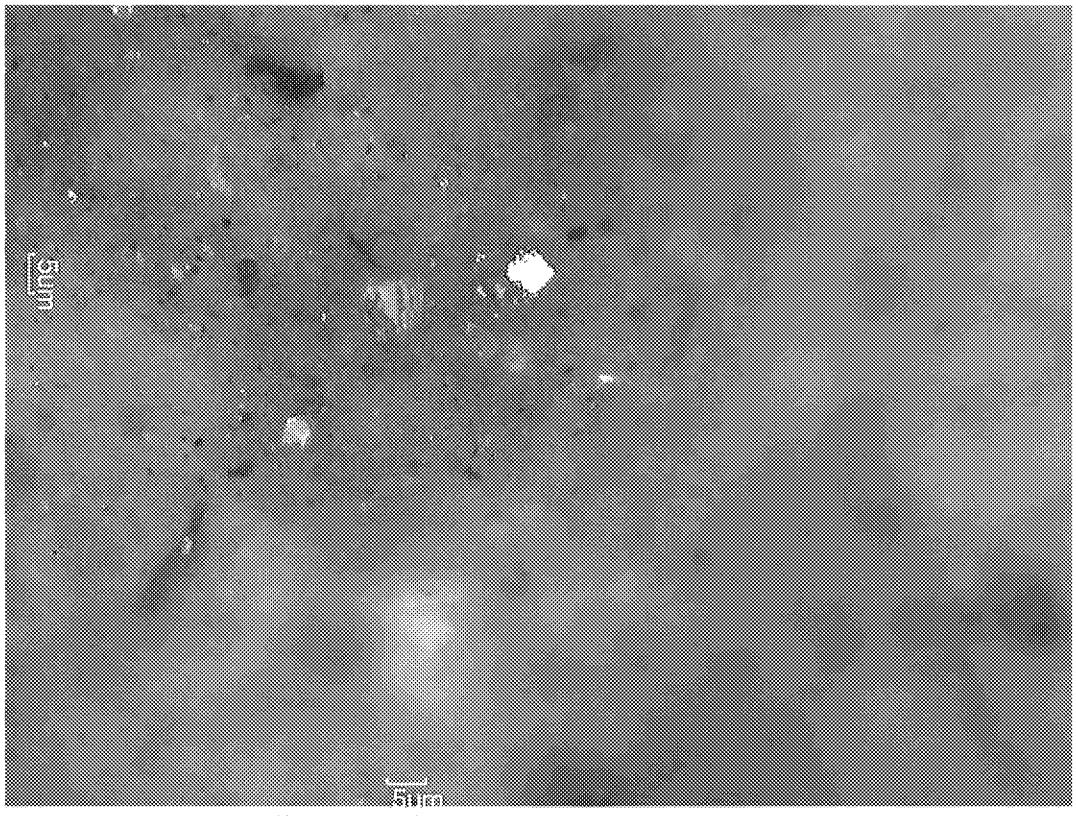
Numerous black organics, clear quartz/feldspar and red iron oxide in clay matrix. Reflected light crossed Nichols – 200X.



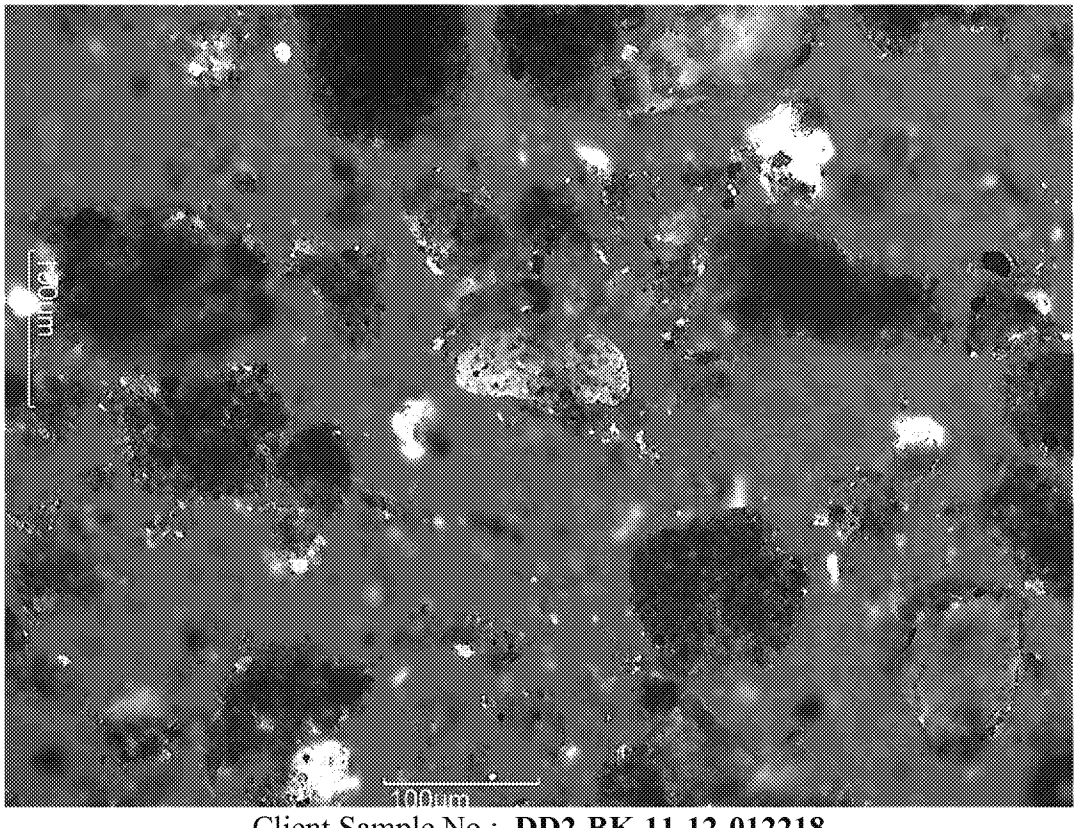
Client Sample No.: **DD2-BK-11-12-012218**
Fragments of quartz/feldspar and dark organics in an iron stained clay matrix. Reflected light crossed Nichols – 200X.



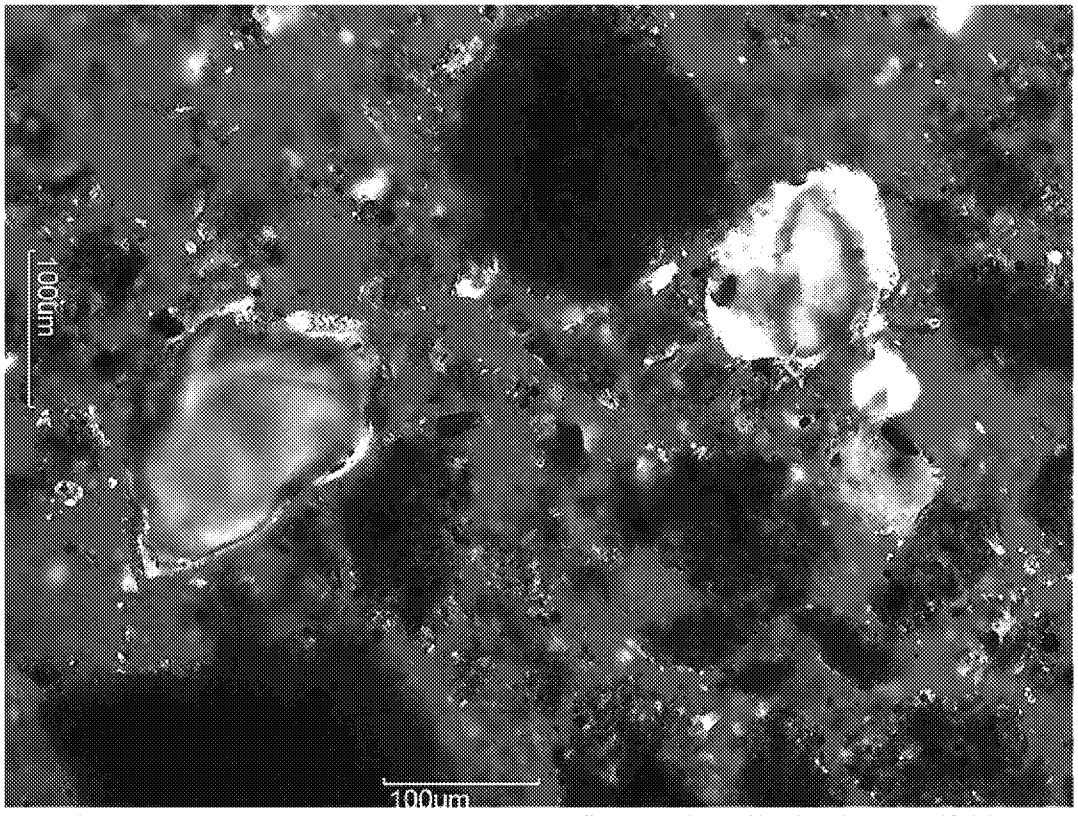
Client Sample No.: **DD2-BK-11-12-012218**
Black organics and small grains of iron oxide in clay. Reflected light crossed Nichols - 200X



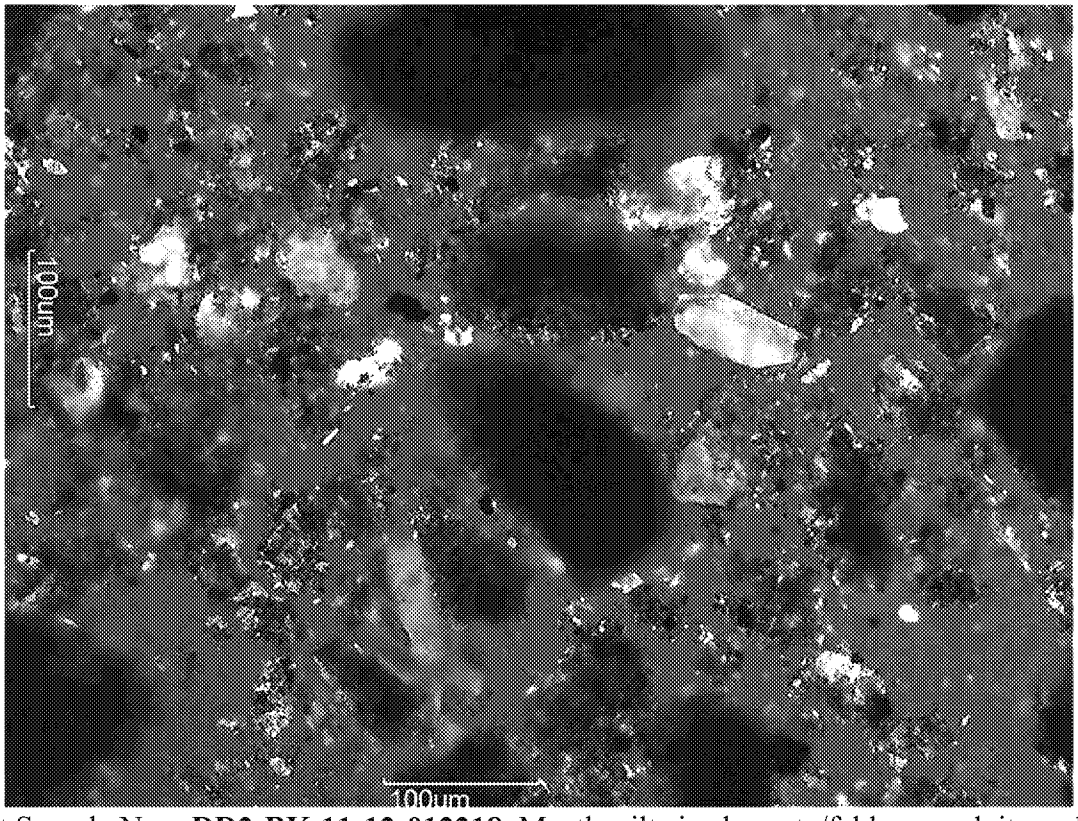
Client Sample No.: **DD2-BK-11-12-012218**
A small cube of pyrite included in iron stained clay matrix. Reflected light – 500X.



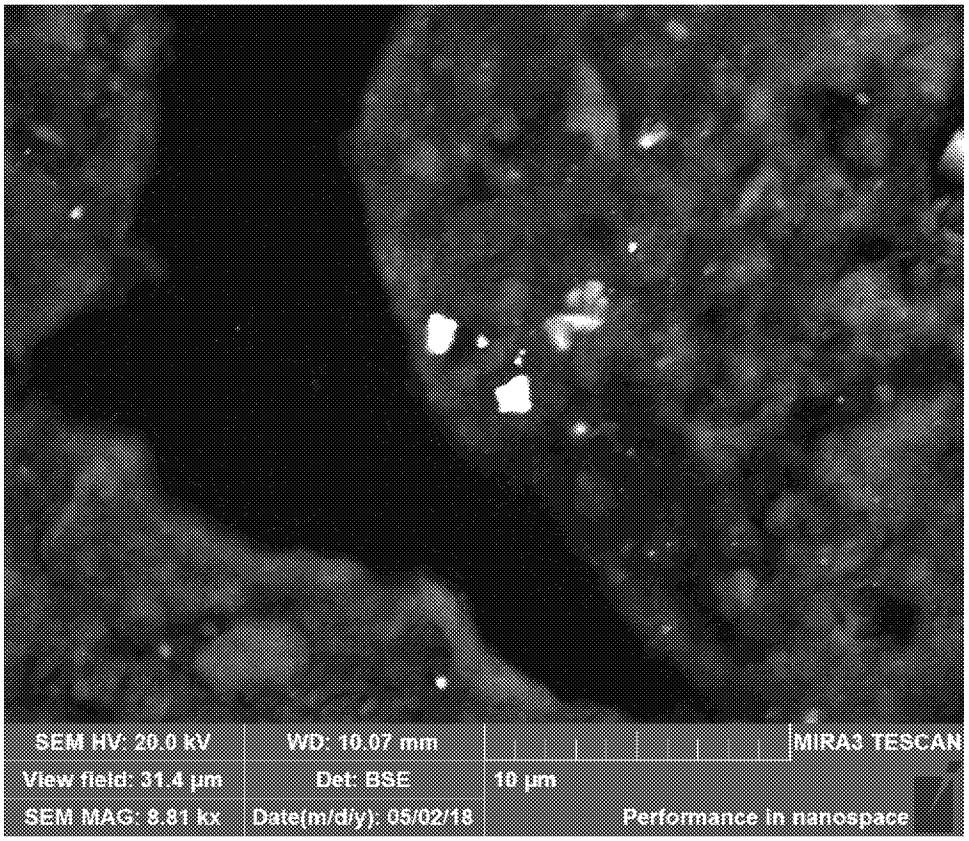
Client Sample No.: **DD2-BK-11-12-012218**
Very fine sand to silt sized quartz/feldspar, calcite and clay masses with opaque inclusions.
Polarized light – 100X.



Client Sample No.: **DD2-BK-11-12-012218** Very fine sand to silt sized quartz/feldspar and clay masses with opaque inclusions. Polarized light – 100X.

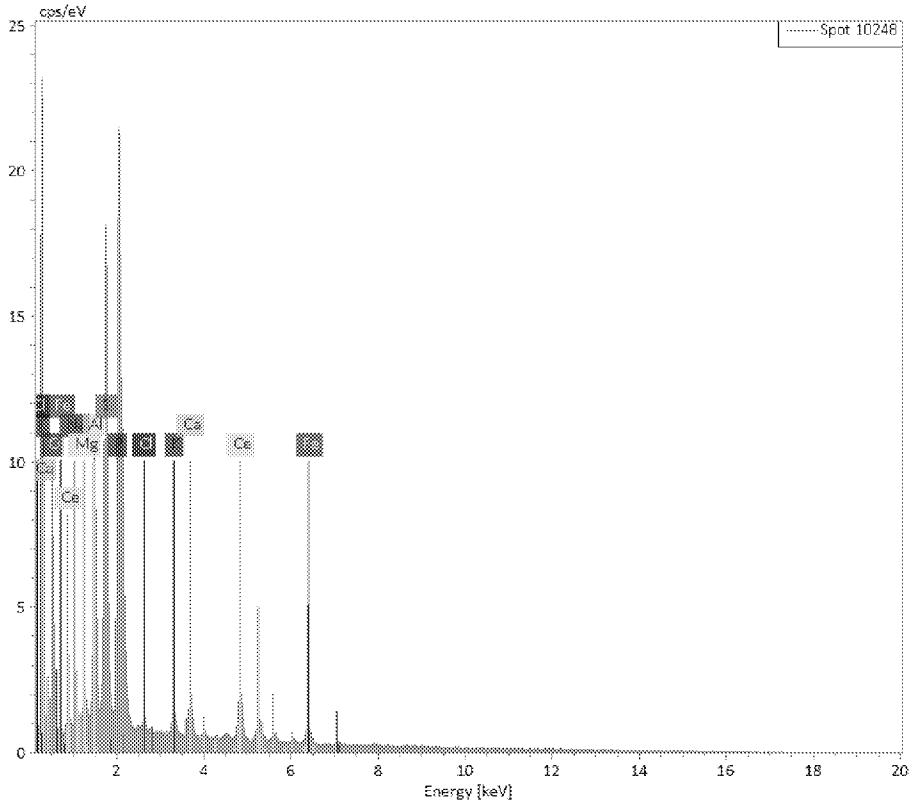


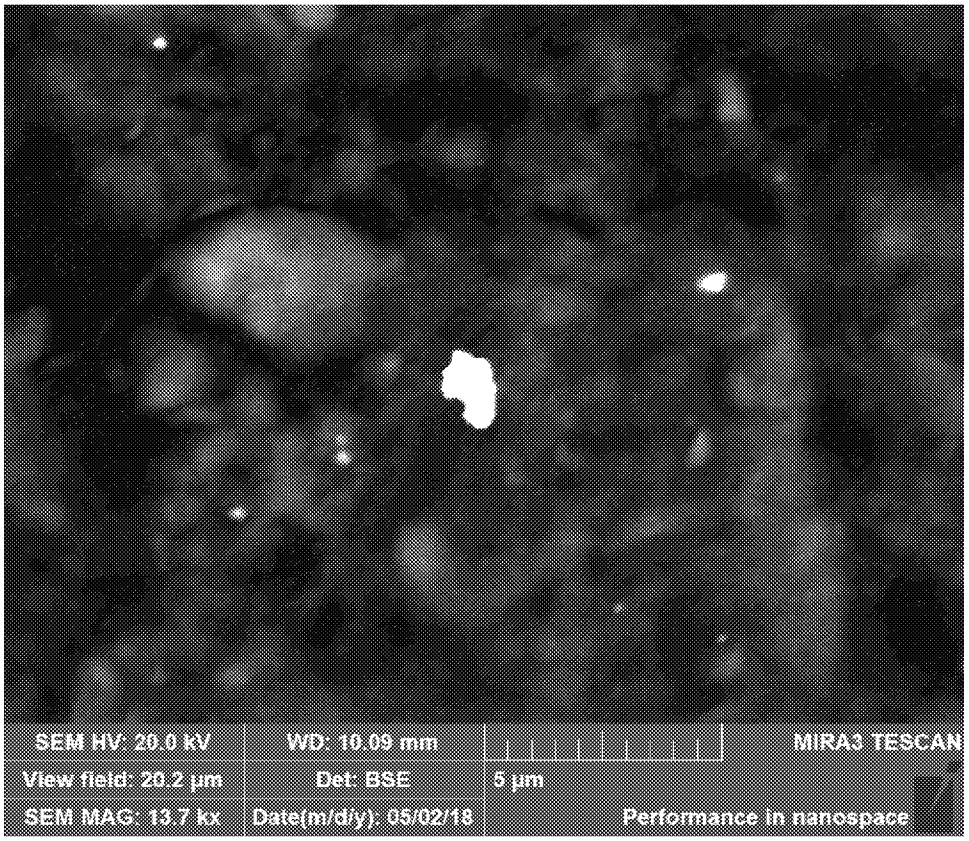
Client Sample No.: **DD2-BK-11-12-012218** Mostly silt sized quartz/feldspar, calcite and dark clay masses. Polarized light – 100X.



Client Sample No.: **DD2-BK-11-12-012218**

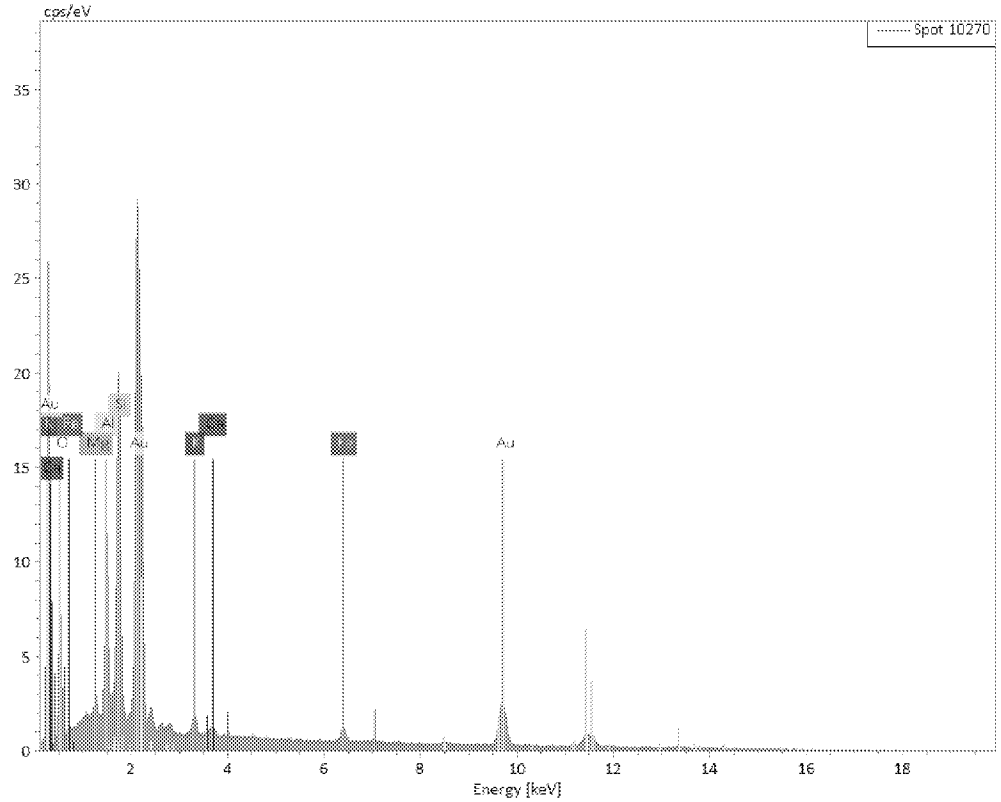
Backscatter image showing small bright grains of phosphate with Ce content in clay – 8,810X.

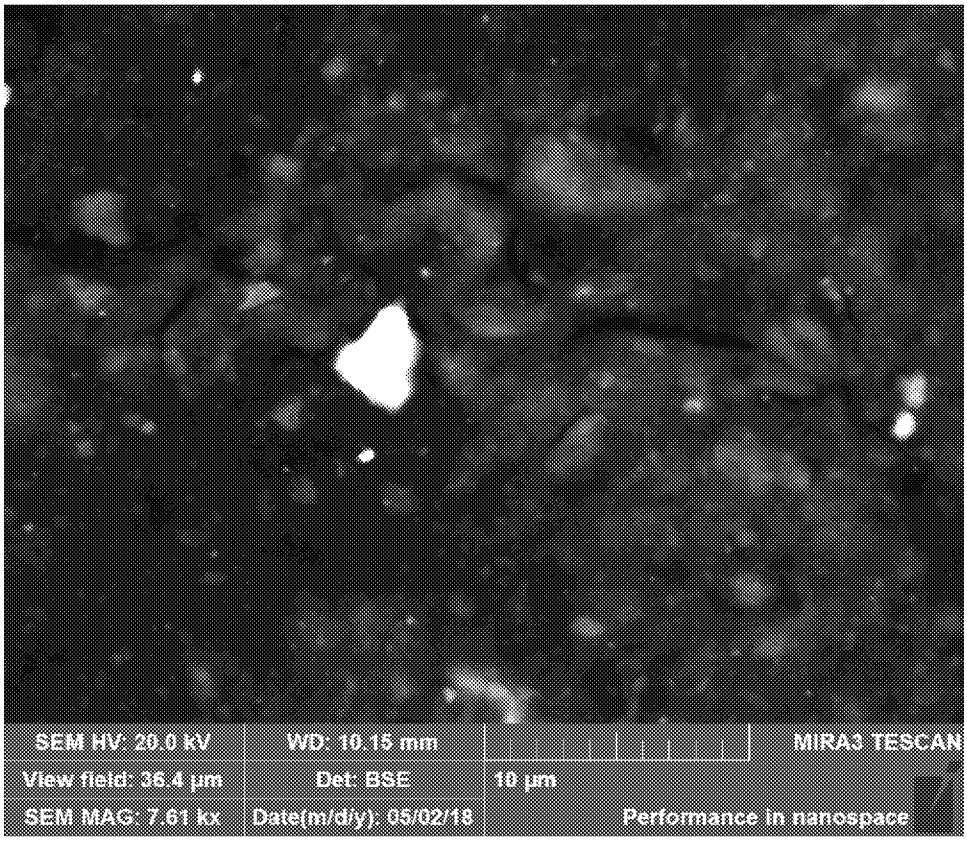




Client Sample No.: **DD2-BK-11-12-012218**

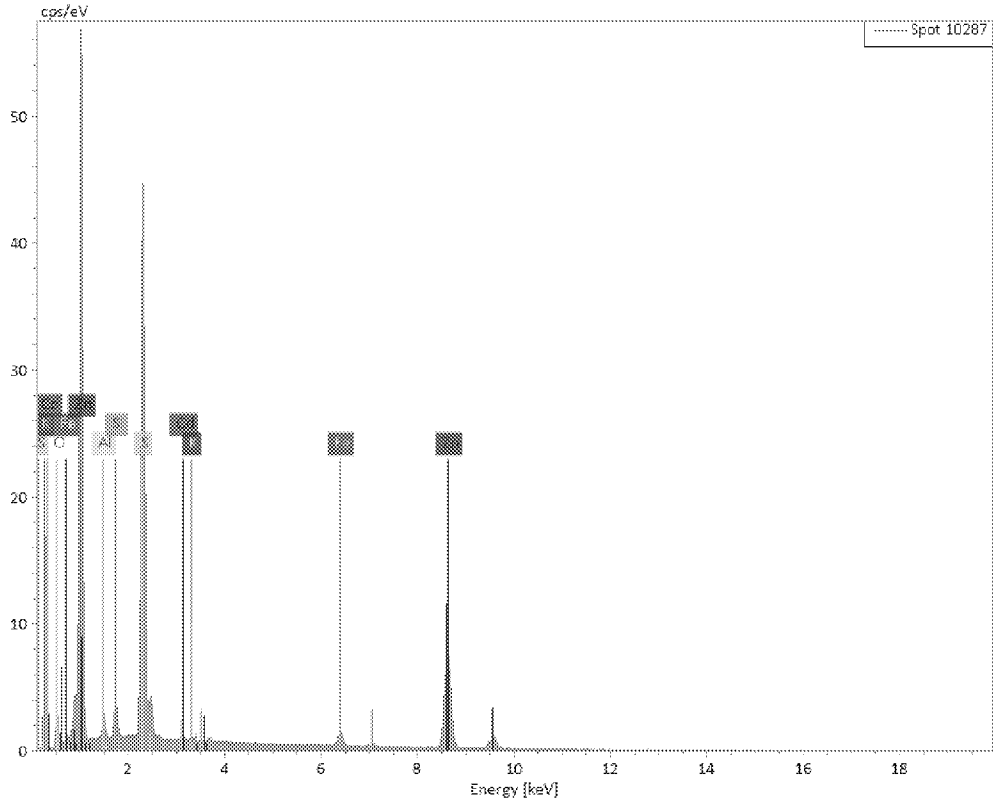
Backscatter image of a small bright grain of Au in clay – 13,700X.

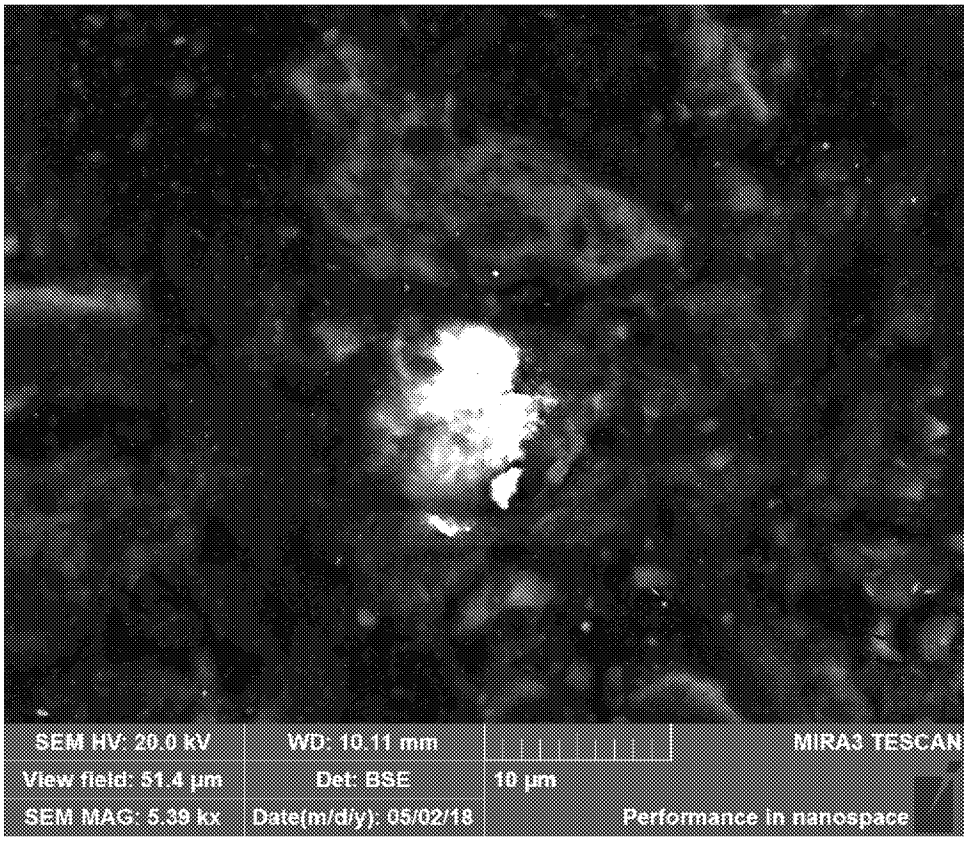




Client Sample No.: **DD2-BK-11-12-012218**

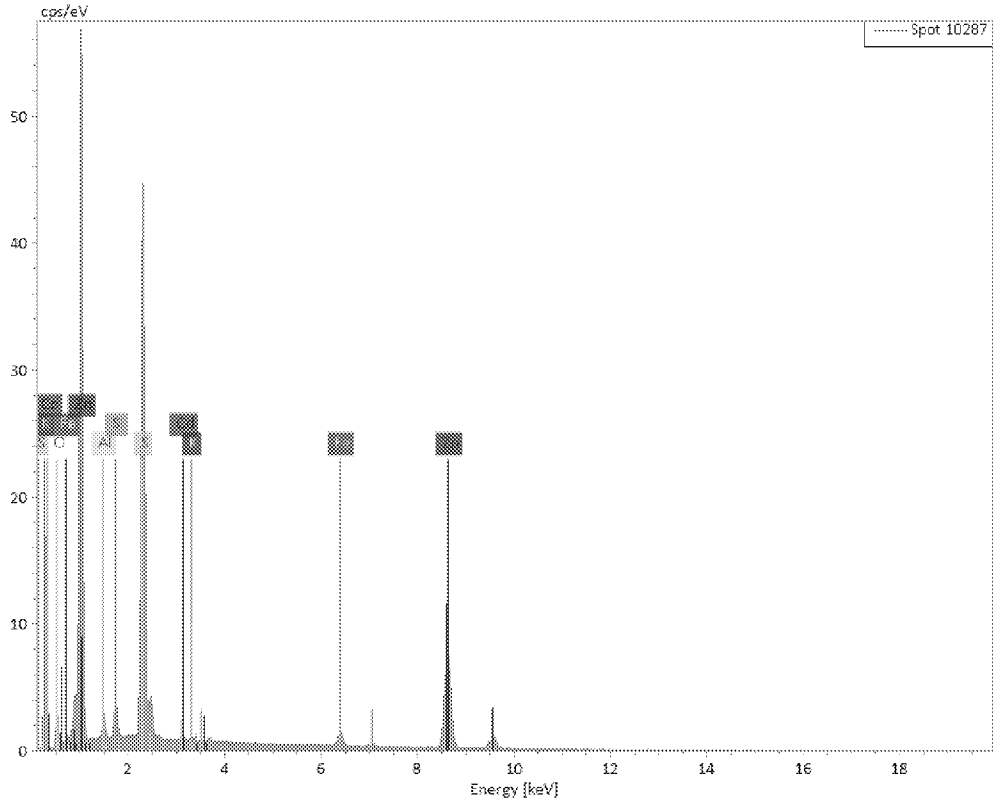
Backscatter image of a small sphalerite fragments in clay – 7,610X.

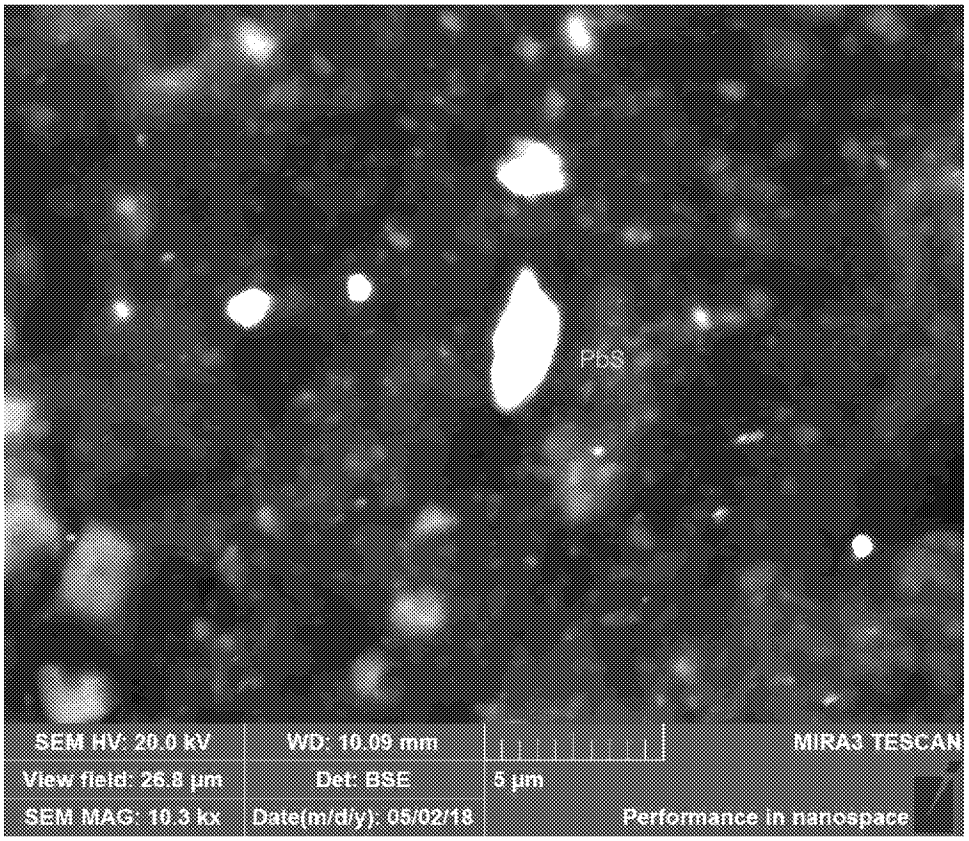




Client Sample No.: **DD2-BK-11-12-012218**

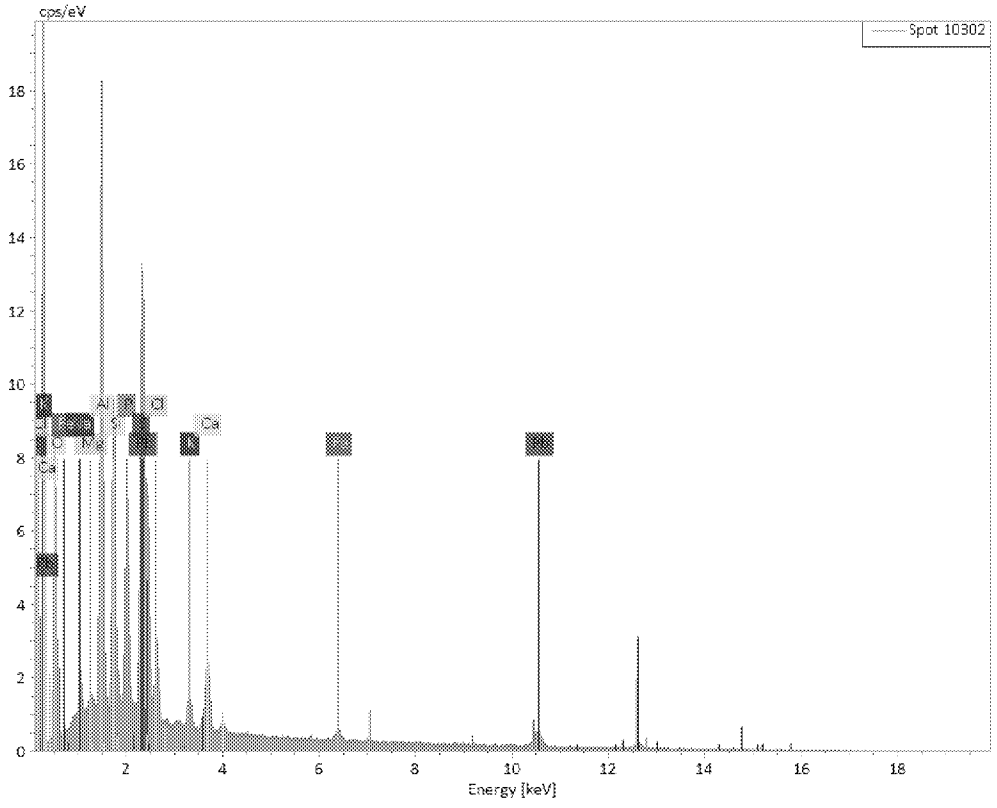
Backscatter image of barite included in a clay matrix – 5,390X.





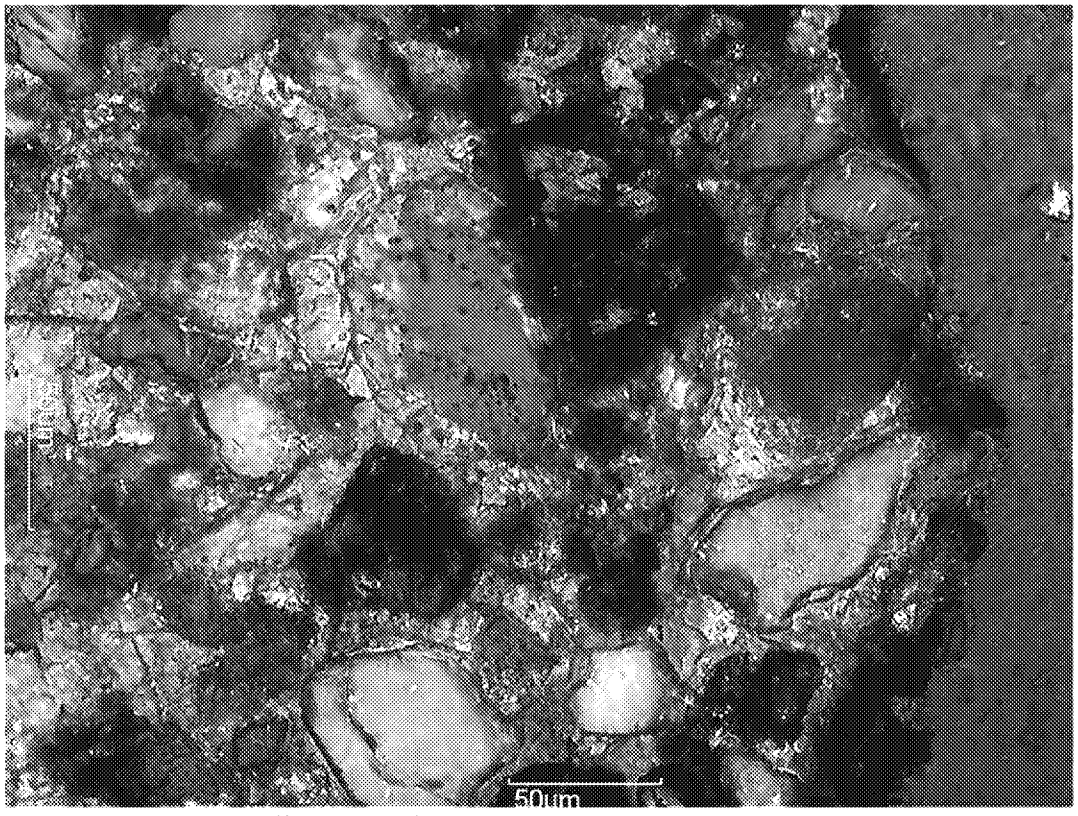
Client Sample No.: **DD2-BK-11-12-012218**

Backscatter image showing a fragment of galena in clay. Other bright grains are iron oxide – 10,300X.

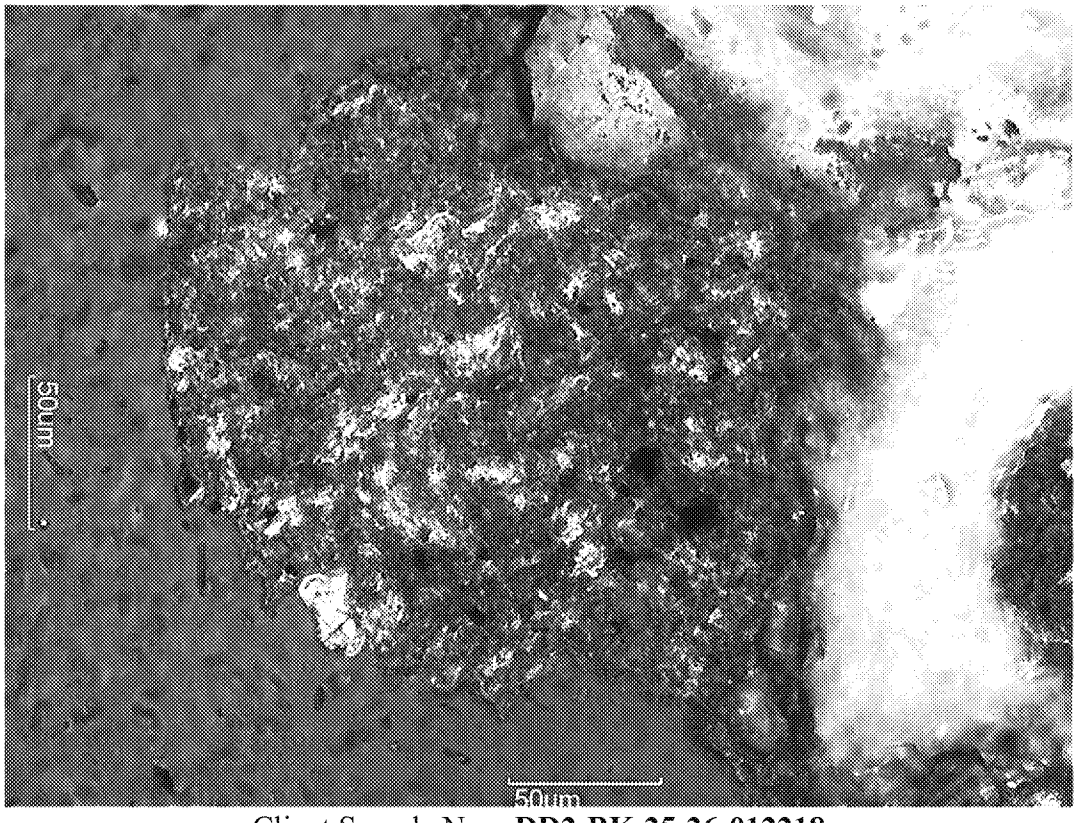


Client Sample No: **DD2-BK-25-26-012218**

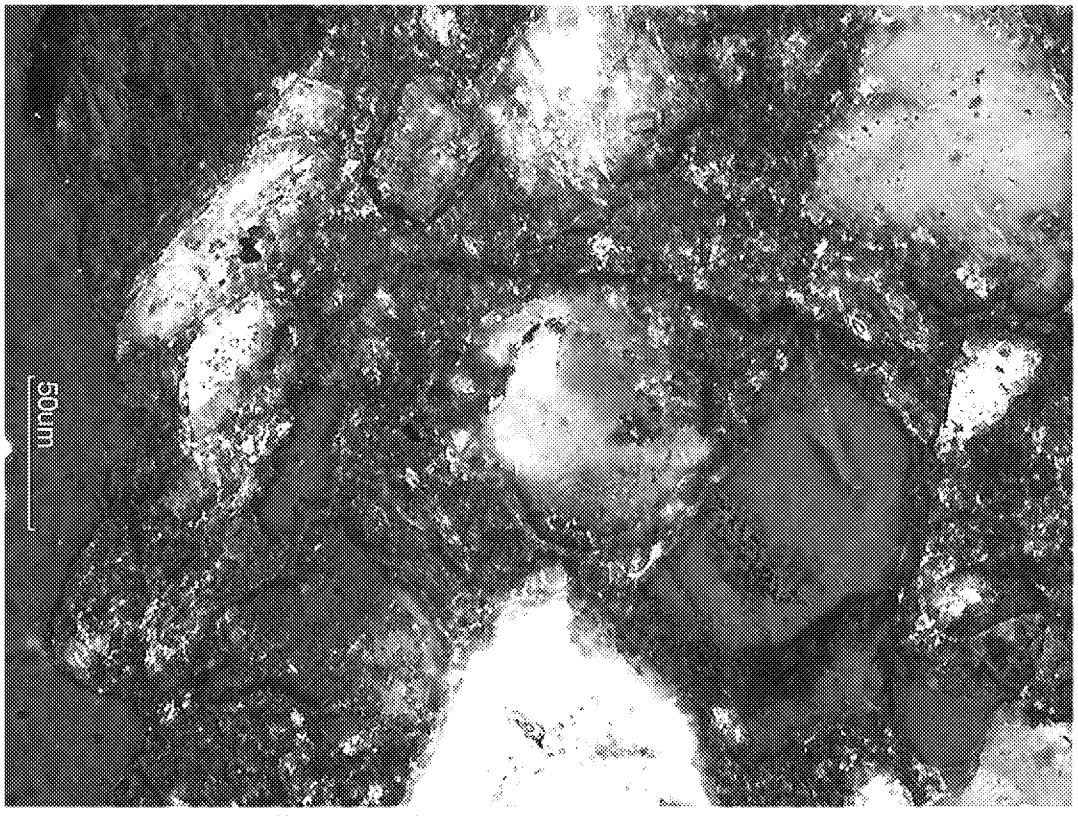
This sample is a tan colored, gravelly, fine to coarse sand with some silt/clay content. XRD and thin section studies indicate the sample is composed primarily of quartz (~78%). Individual quartz grains occur as sub-rounded to well rounded grains that vary significantly in size from 20μm to over 1mm. Quartz also occurs in granitic rock fragments where it is associated with feldspars. Approximately 5-8% of the total silica is in the form of rounded grains of microcrystalline chert and fibrous looking chalcedony. Feldspar in the sample is primarily K-spar (~9%). Microcline is the primary type with lesser amounts of clear to cloudy orthoclase. It occurs as sub-rounded to well rounded grains that vary in size from 20μm to 700μm. Although most of the K-spar occurs as liberated individual grains, some grains are present in multi-mineral rock fragments. The sample carries some rhyolitic rock fragments with sanidine. Plagioclase (~5%) generally occurs as sub-rounded to fairly well rounded, liberated grains with a grain size that varies from 20μm up to 400μm. Composition varies from albite to andesine, however, some labradorite is present. There are several fragments of basalt where plagioclase occurs as thin lath shaped grains. Calcite occurs in low amounts (~3%) and occurs as liberated fragments in the 50μm to 500μm size range. Some finer grained calcite is seen cementing quartz/feldspar where it is associated with a trace of iron oxide. A large mass of iron oxide that represents the replacement of pyrite cubes and framboids is seen cementing quartz/feldspar. Other oxides include a trace of magnetite, ilmenite, rutile and leucoxene. Although XRD identifies some illite/mica (~3%) no apparent smectite or kaolinite shows on the XRD pattern, however, these clays are strongly suspected. Many of the larger silicate fragments have clay coatings and some clay is seen cementing fine grained quartz/feldspar. One angular fragment of isotropic volcanic glass was identified and carries numerous opaque, acicular inclusions. FE-SEM/EDS identifies some barite included in quartz and a small grain of a rare earth phosphate in quartz with significant Th content. In clay coating a quartz grain, FE-SEM/EDS identified a grain rich in V and REE's. However, U was not identified in this sample.



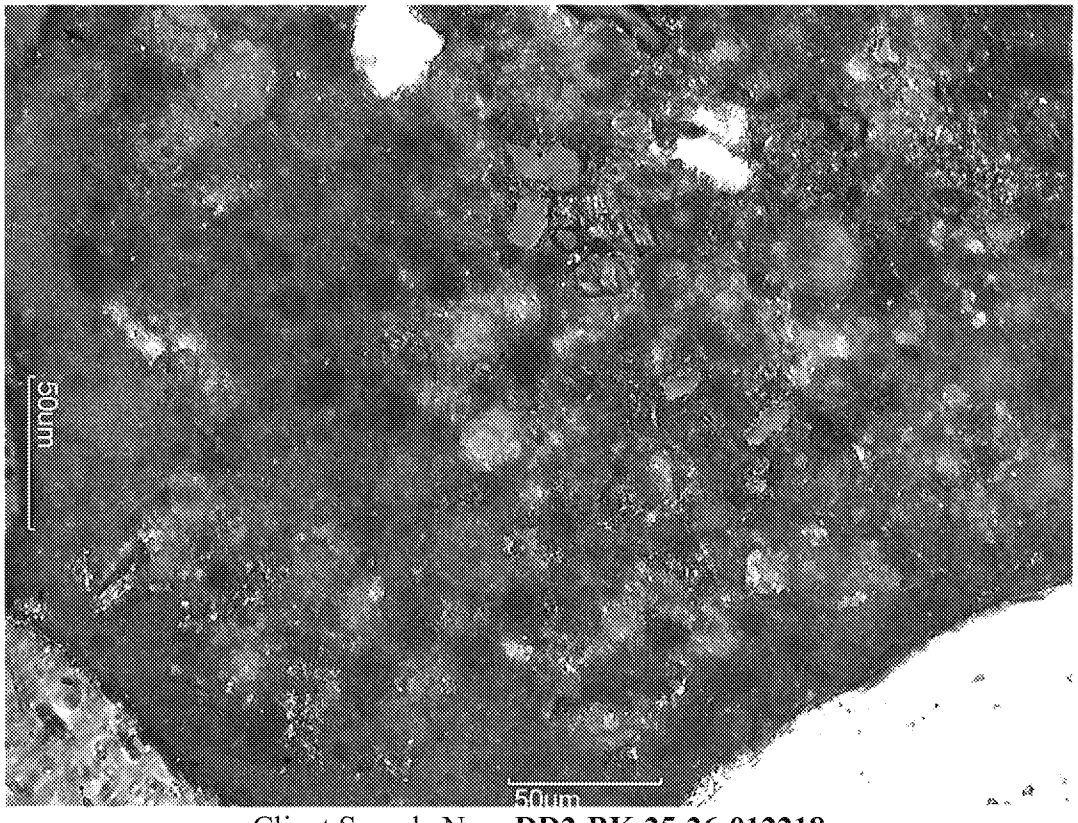
Client Sample No.: **DD2-BK-25-26-012218**
Calcite and iron oxide cement quartz/feldspar grains. Reflected light crossed Nichols – 200X.



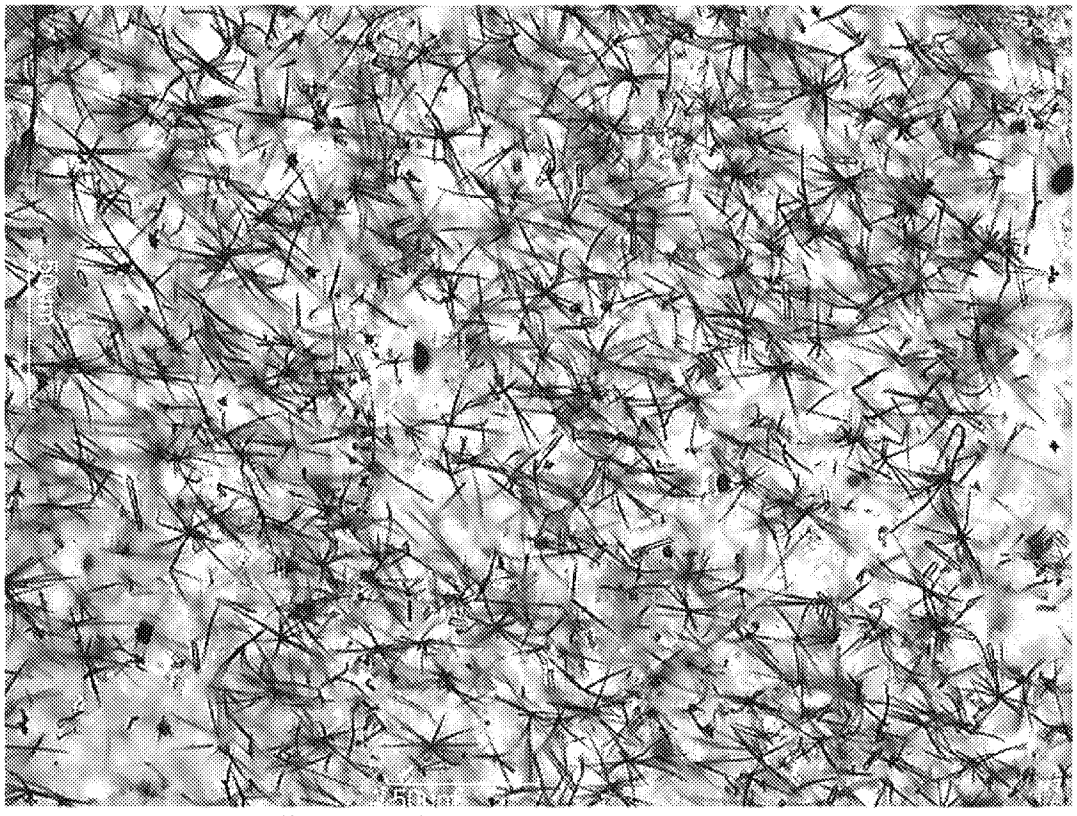
Client Sample No.: **DD2-BK-25-26-012218**
Small aggregate of clay attached to quartz. Polarized light – 200X.



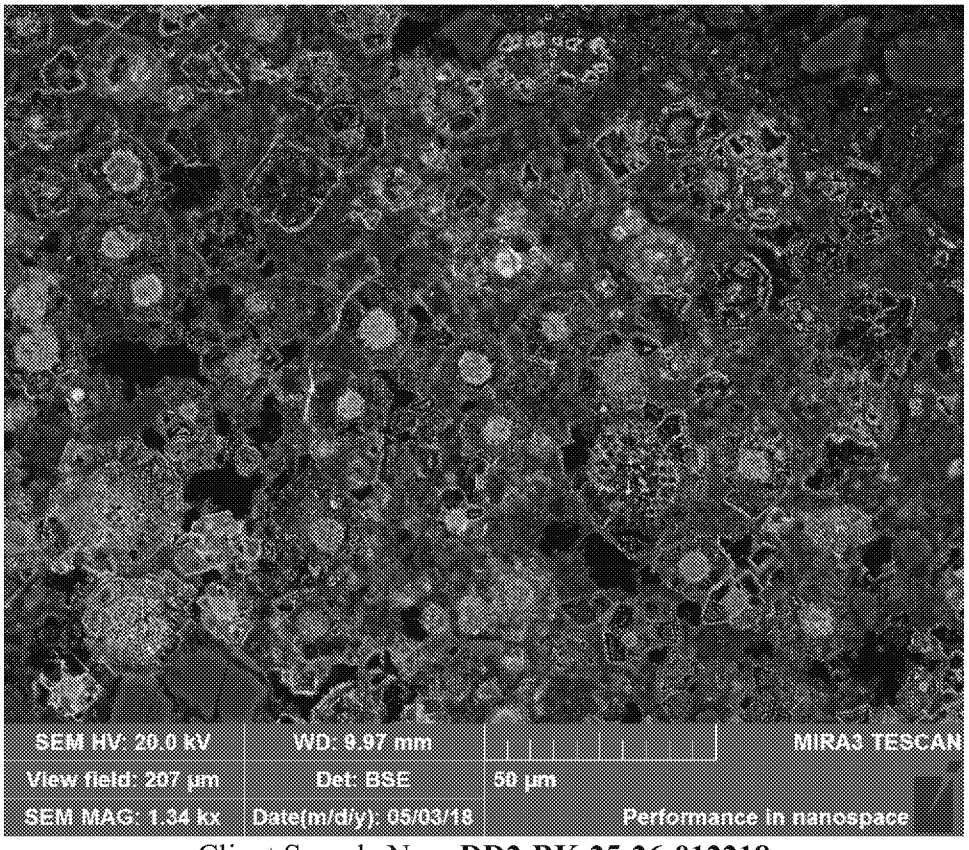
Client Sample No.: **DD2-BK-25-26-012218**
Clay cementing grains of quartz/feldspar. Polarized light – 200X.



Client Sample No.: **DD2-BK-25-26-012218**
Iron oxide pseudomorphs after pyrite and pyrite framboids. Reflected light crossed Nichols – 200X.

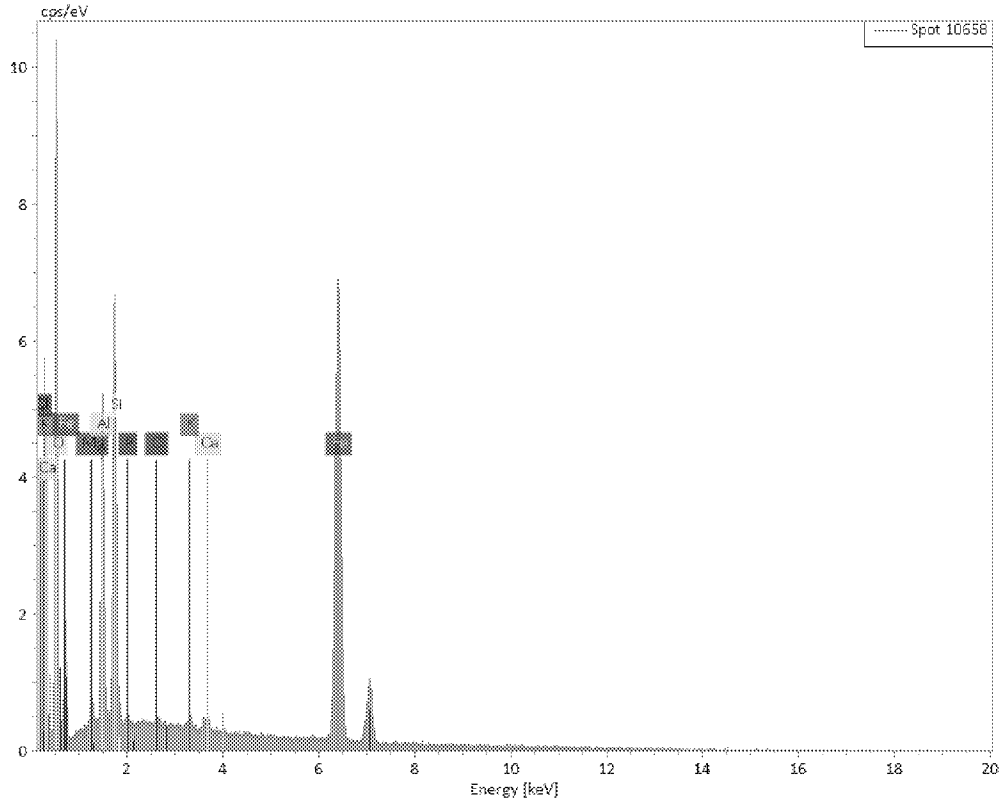


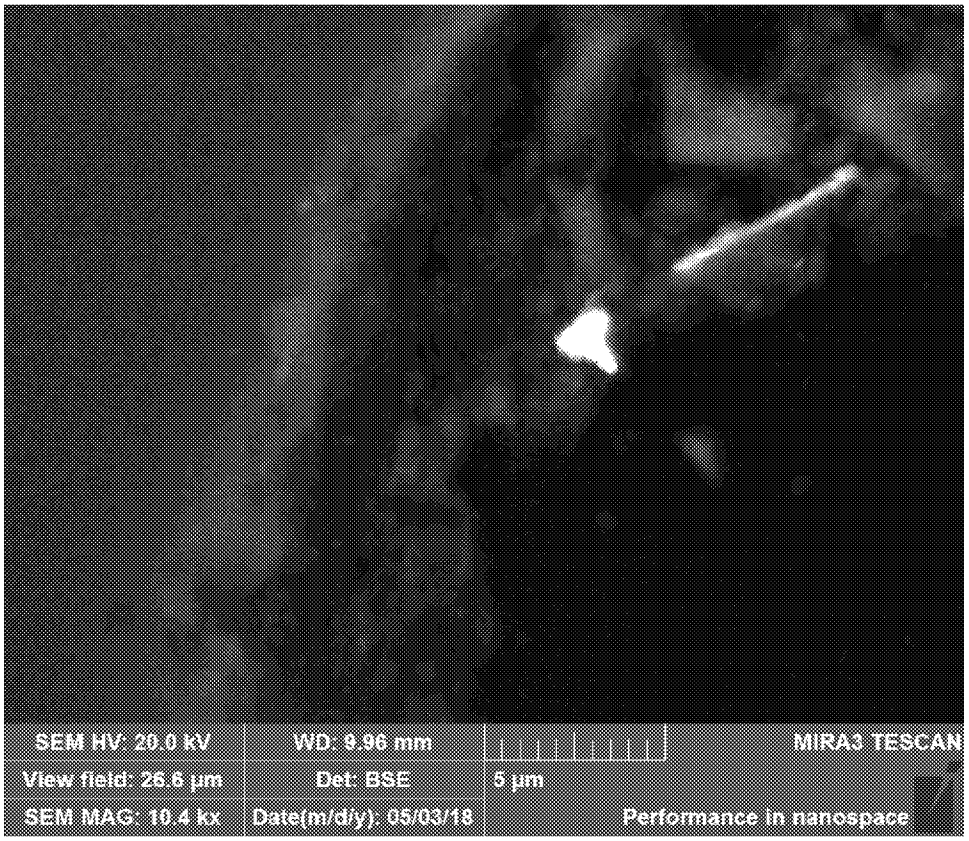
Client Sample No. **DD2-BK-25-26-012218**
Isotropic volcanic glass riddled with unknown opaque, acicular crystallites. Polarized light – 250X.



Client Sample No.: **DD2-BK-25-26-012218**

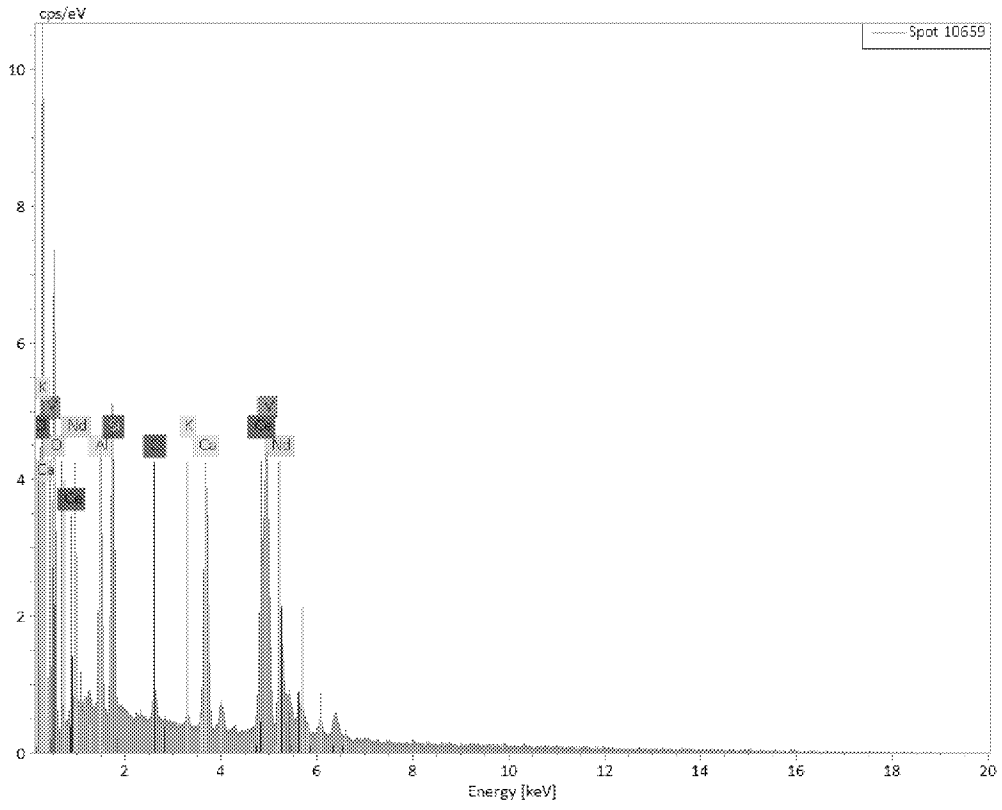
Backscatter image of iron oxide pseudomorphs after pyrite cubes and framboids – 1,340X.

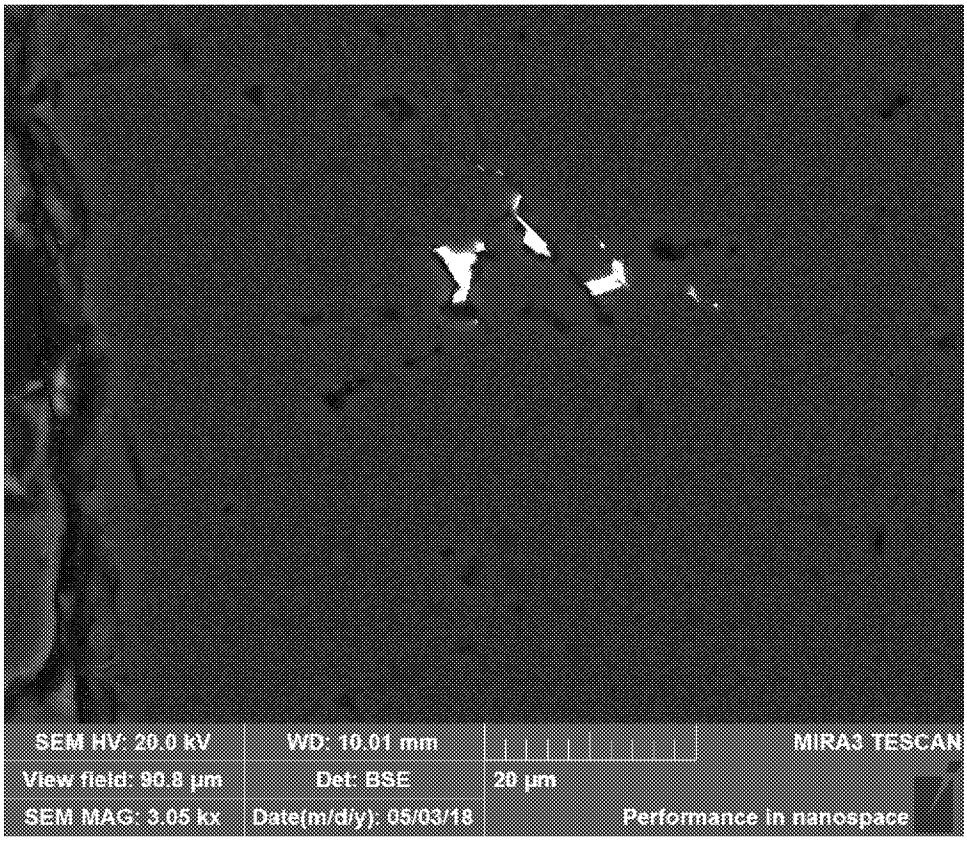




Client Sample No.: **DD2-BK-25-26-012218**

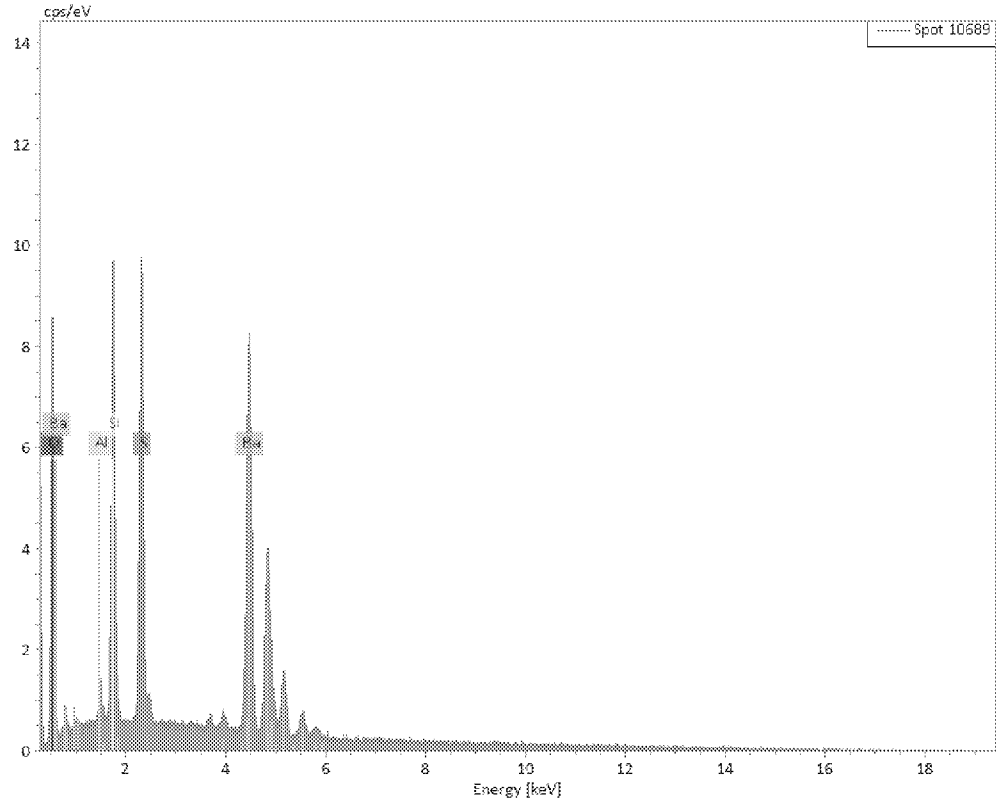
Backscatter image of a small bright grain composed of rare earth elements and V. Bright rod-shaped grain is Ti/Fe oxide – 10,400X.

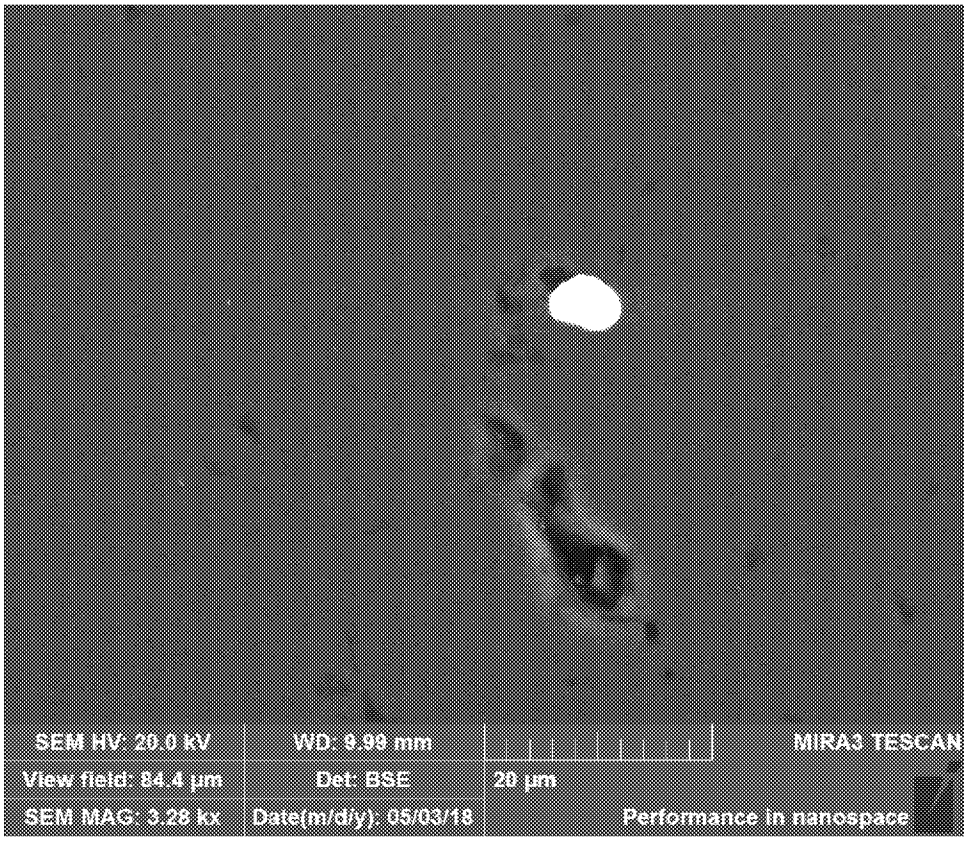




Client Sample No.: **DD2-BK-25-26-012218**

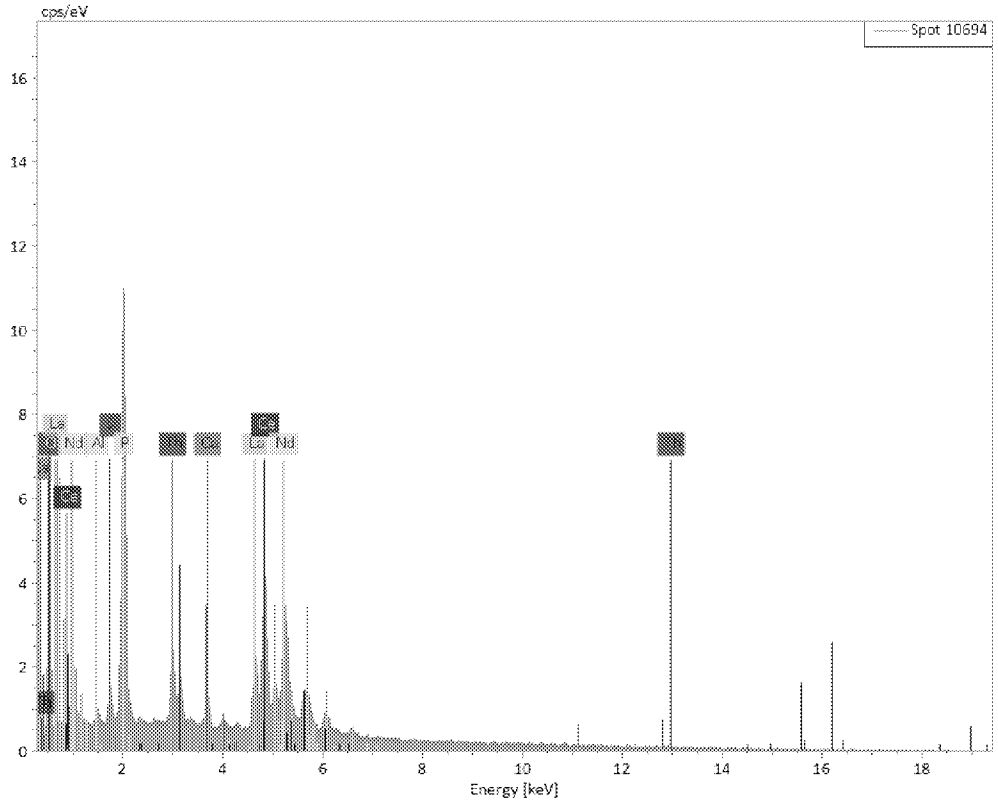
Backscatter image of quartz with bright inclusions of barite – 3,040X.





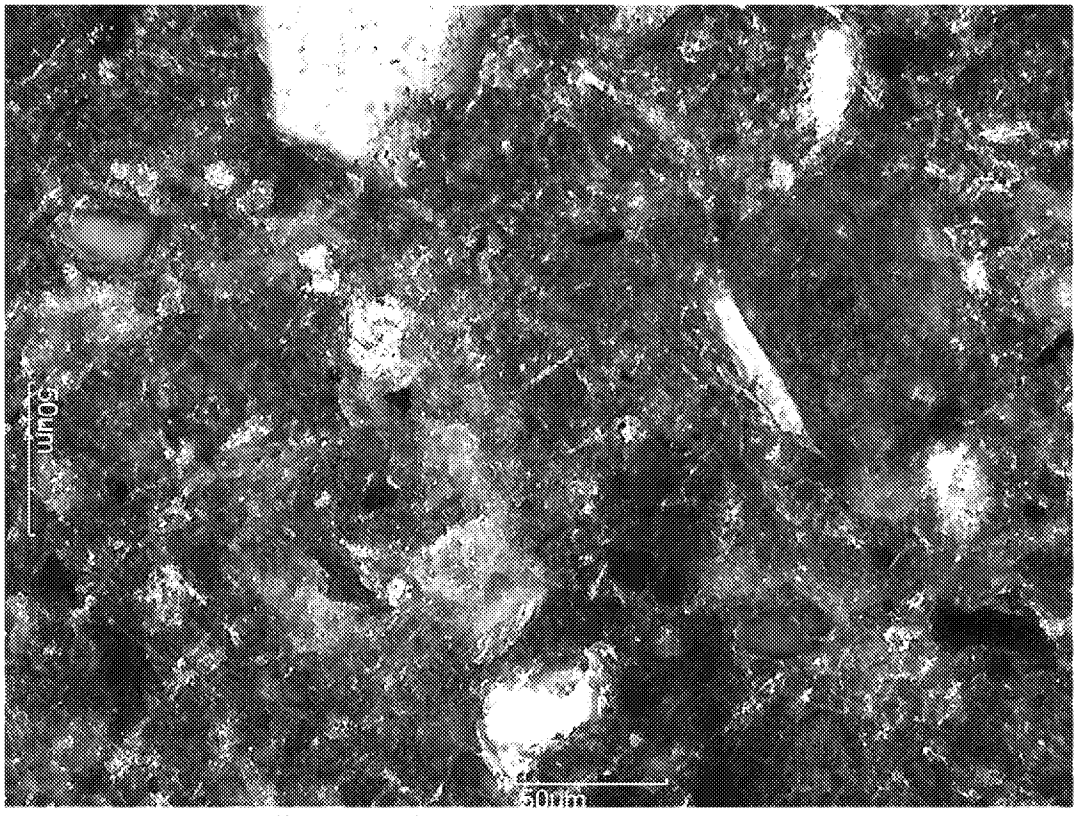
Client Sample No.: **DD2-BK-25-26-012218**

Backscatter image of quartz with a bright rare earth phosphate grain showing elevated Th – 3,280X.

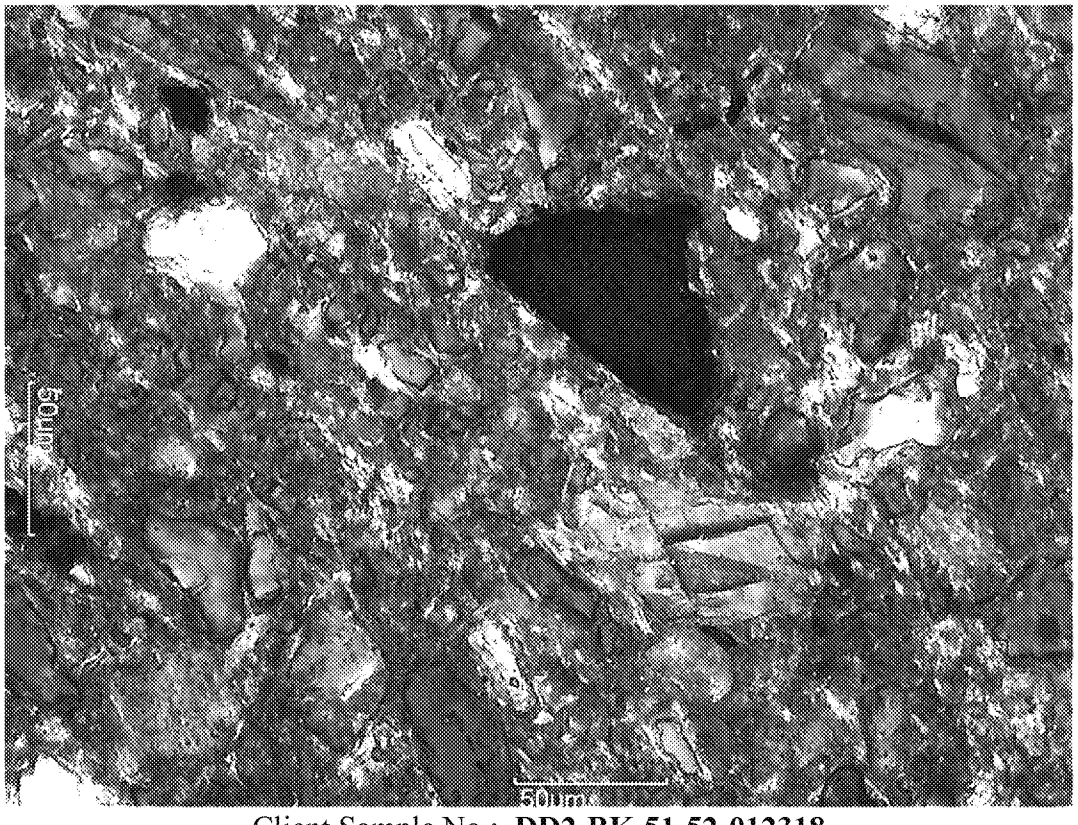


Client Sample No: **DD2-BK-51-52-012318**

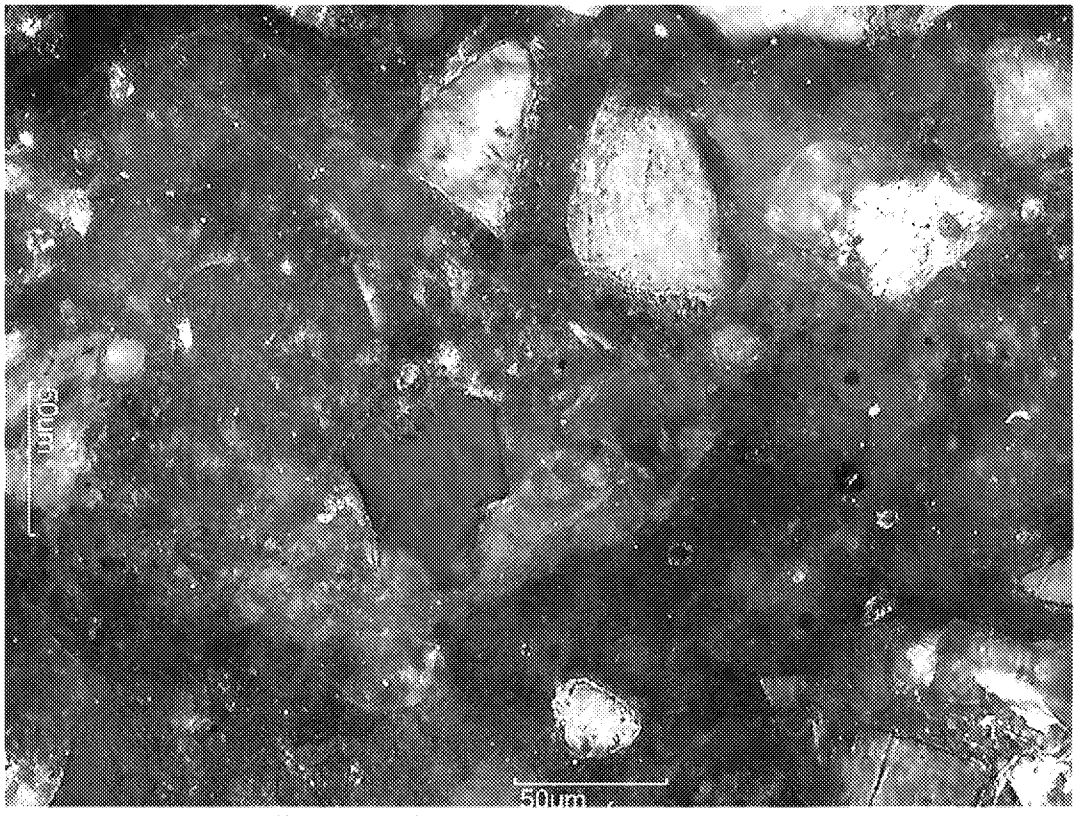
This sediment sample is a tan colored silty sand with appreciable clay content. XRD indicates quartz is the primary component of the sample at approximately 54%. Quartz grains occur as angular to rounded grains that vary significantly in size from fine to coarse silt (5μm-50μm) to very fine to fine sand (65μm-250μm). Approximately 2-3% of the quartz is dirty looking rounded grains of chert and chalcedony that generally fall in the very fine to fine sand size. Plagioclase and potassium feldspar are present in similar amounts and have dimensions in the silt to very fine sand size range. Plagioclase (~12%) occurs as angular to sub-rounded grains and has a bulk composition that varies from albite to andesine. The K-spar (~10%) is primarily orthoclase and lesser amounts of grid twinned microcline. Individual grains are angular to sub-rounded and have similar dimensions to the plagioclase. XRD indicates total clay content is in excess of 20%. Swelling smectite (~13%) is the primary type with lesser amounts of kaolinite (~6%) and illite (~2%). In thin section the clays are seen associated with iron oxide and acting as a weak cement of the silicate clasts. Iron oxide (~1%) occurs as earthy masses and as pseudomorphs after pyrite cubes and framboids. Some of the pseudomorphs carry small shards of relict pyrite. Other oxides include a trace of ilmenite, rutile, magnetite and leucoxene with a grain size up to 15μm. Calcite is present in a low amount of approximately 1%. The carbonate is seen intermixed with clay with a grain size that doesn't exceed 75μm. Carbon from the decay of plants is present as a trace and is generally associated with clay. Barite is present as a trace and is seen as small grains embedded in clay. In one area the barite has a worm like morphology squeezed between quartz/feldspar clasts with clay, suggesting it may be authigenic. FE-SEM/EDS identified a small grain of thorium silicate in quartz but fail to find any association of U.



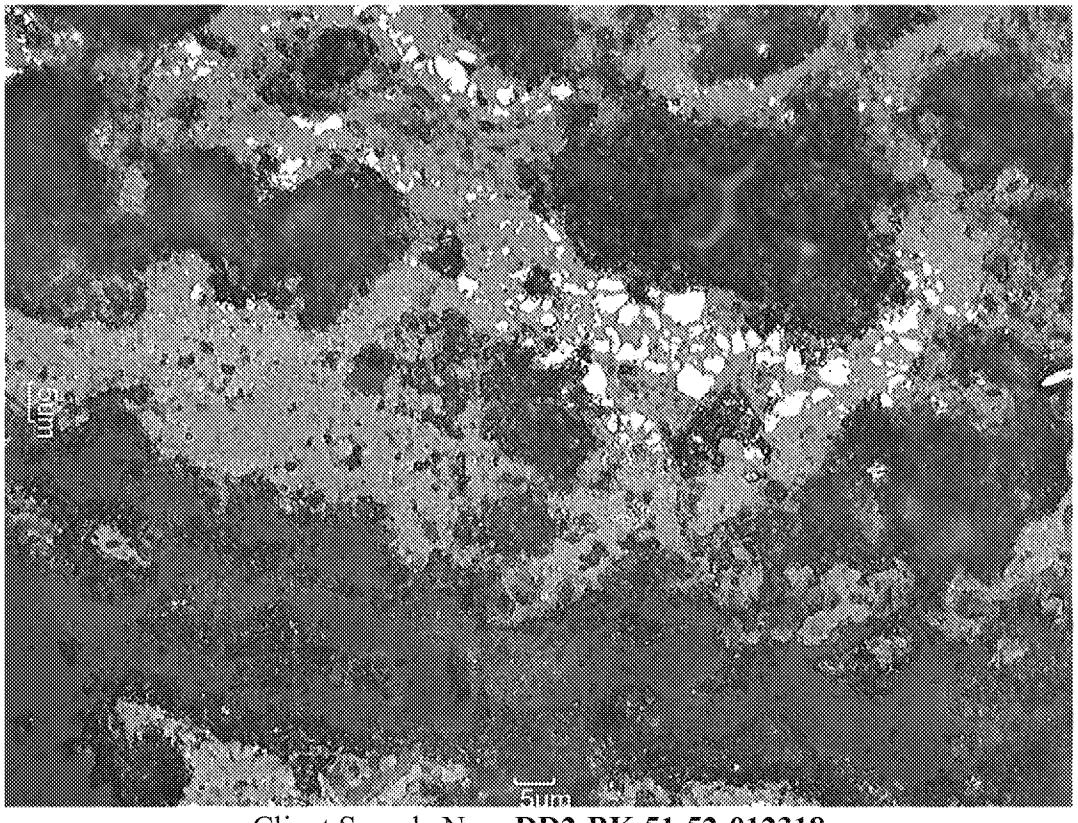
Client Sample No.: **DD2-BK-51-52-012318**
Clay mixed with iron cements quartz/feldspar. Polarized light – 200X.



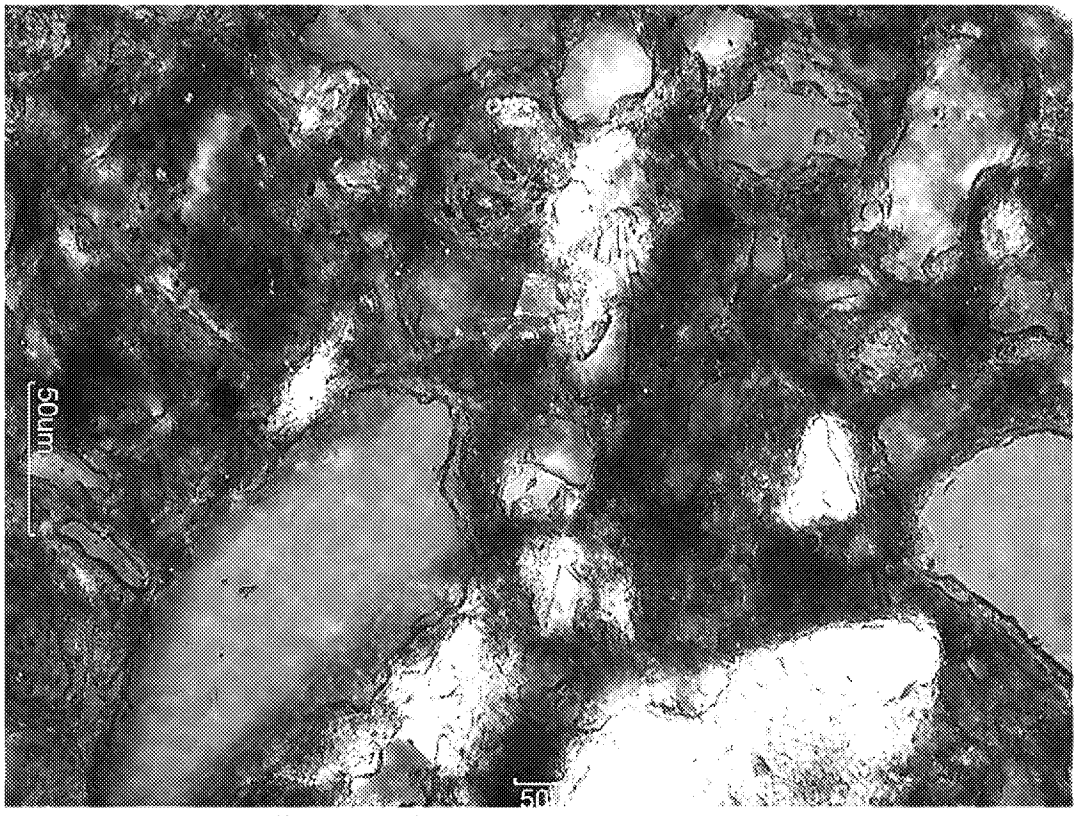
Client Sample No.: **DD2-BK-51-52-012318**
Clay cements carbonate fragments, quartz/feldspar and black carbon. Polarized light – 200X.



Client Sample No.: **DD2-BK-51-52-012318**
Large mass of iron oxide cements quartz/feldspar. Reflect light crossed Nichols – 200X.

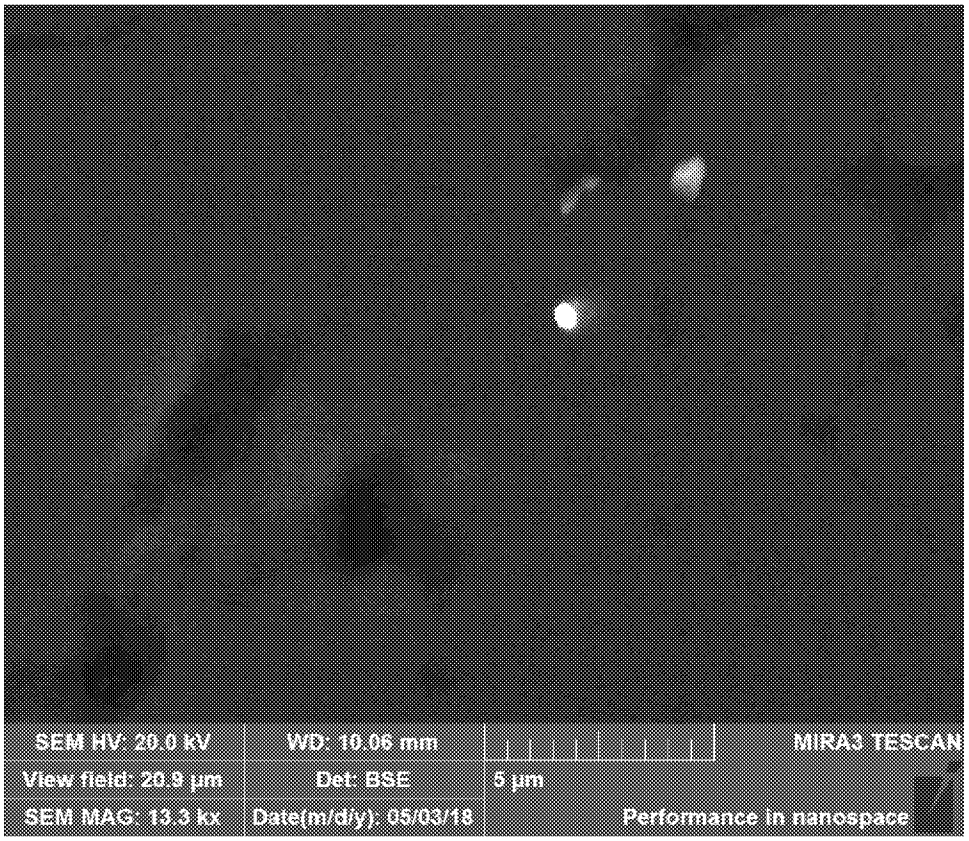


Client Sample No.: **DD2-BK-51-52-012318**
Mass of iron oxide after pyrite contains relict shards of bright pyrite. Reflect light – 500X.



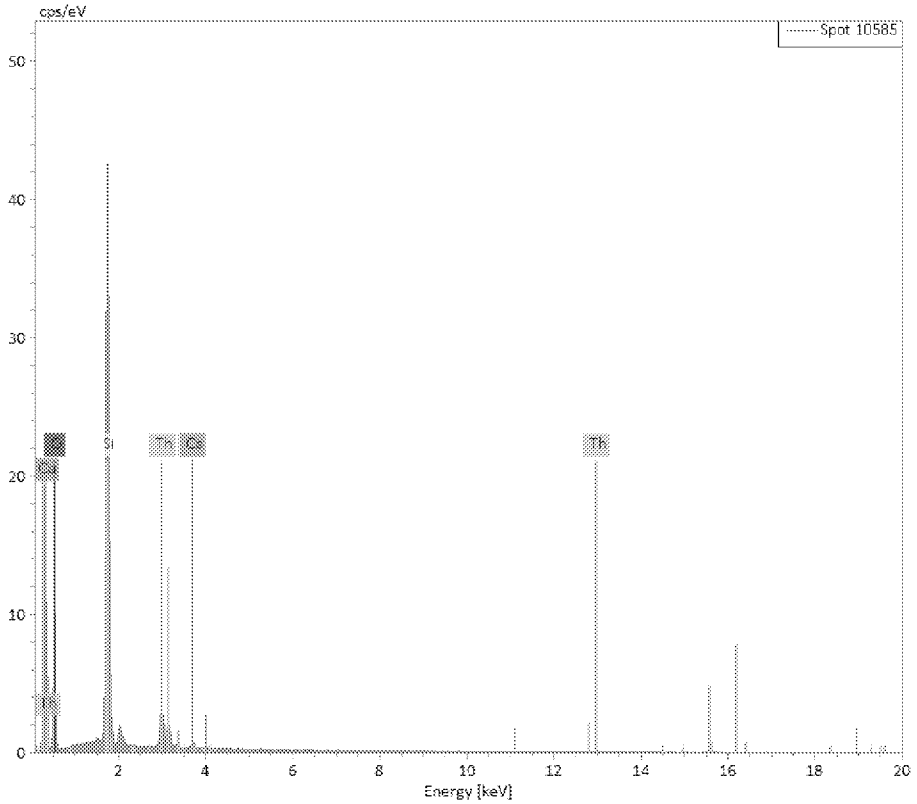
Client Sample No.: **DD2-BK-51-52-012318**

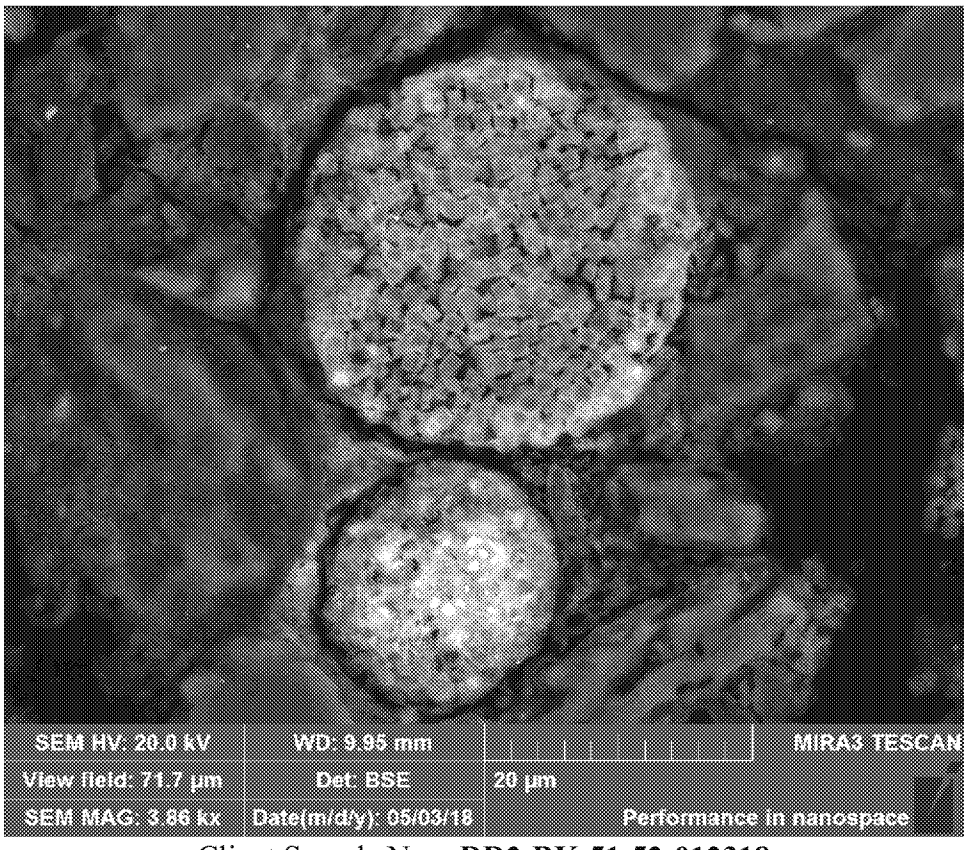
Iron oxide mixed with clay cements quartz/feldspar grains. Reflected light crossed Nichols – 200X.



Client Sample No.: **DD2-BK-51-52-012318**

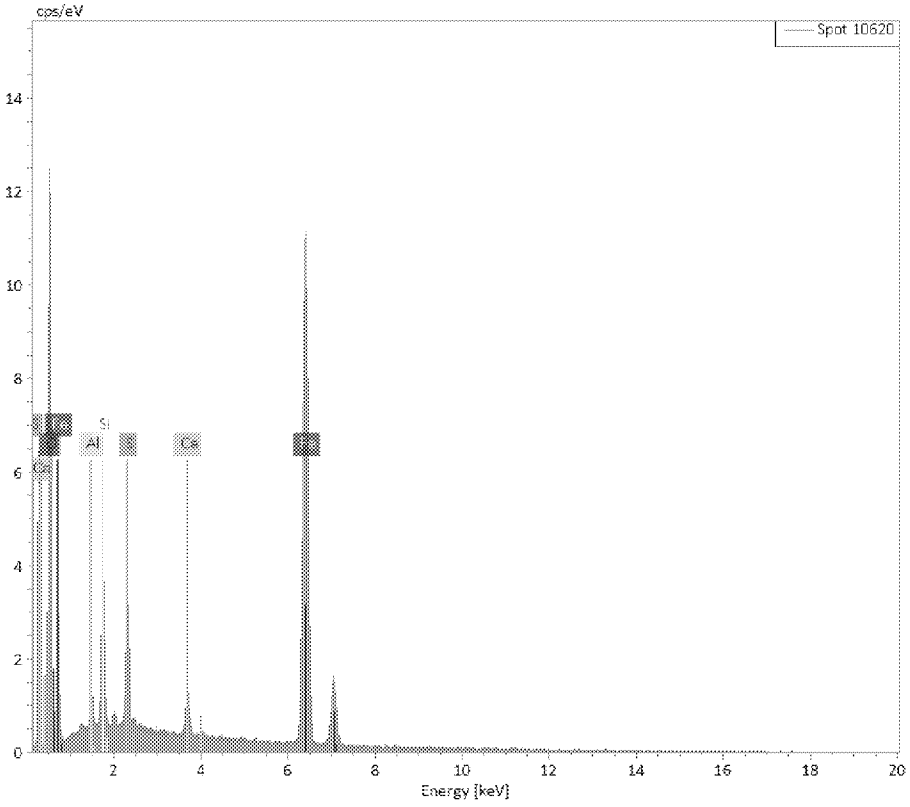
Backscatter image of quartz with a minute grain of thorium silicate (thorite?) – 13,300X.

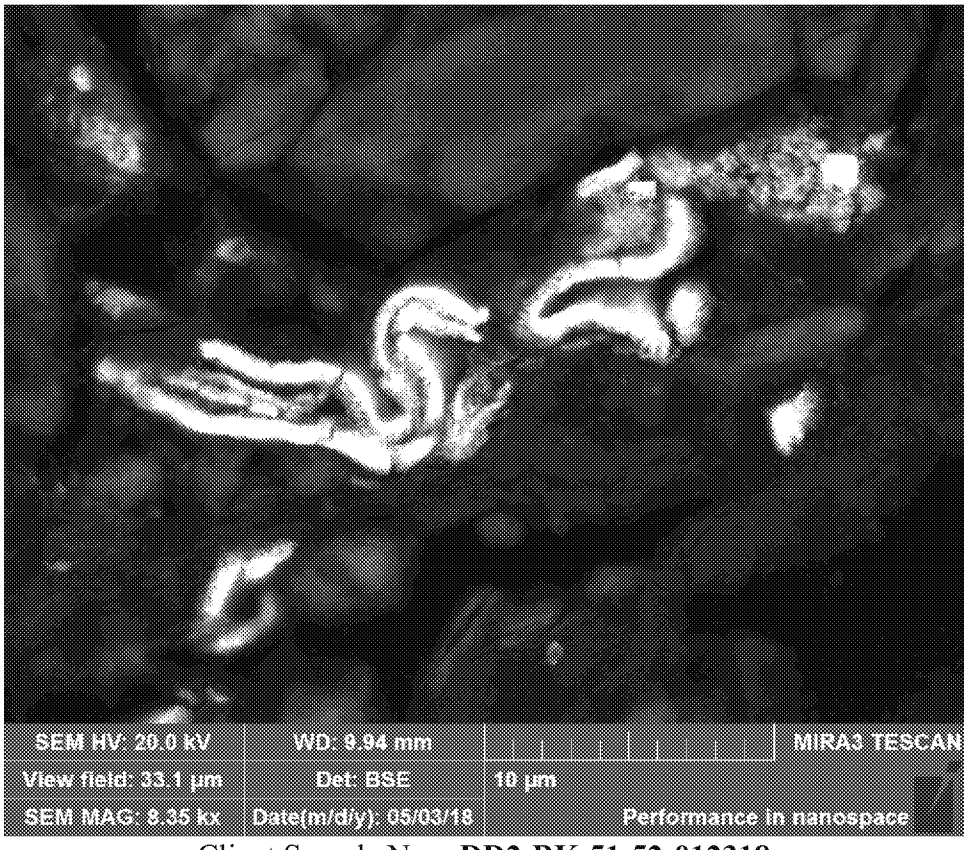




Client Sample No.: **DD2-BK-51-52-012318**

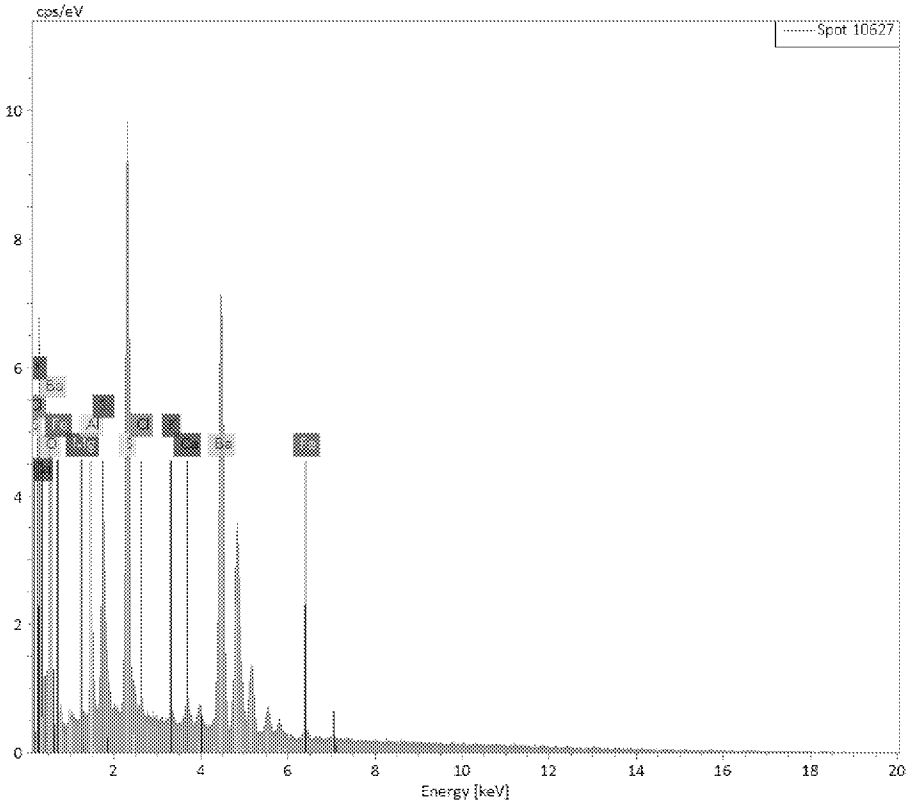
Backscatter image of iron oxide pseudomorphs after pyrite framboids sit in a matrix of clay with quartz/feldspar grains. The smaller pseudomorph contains bright relict pyrite – 3,860X.





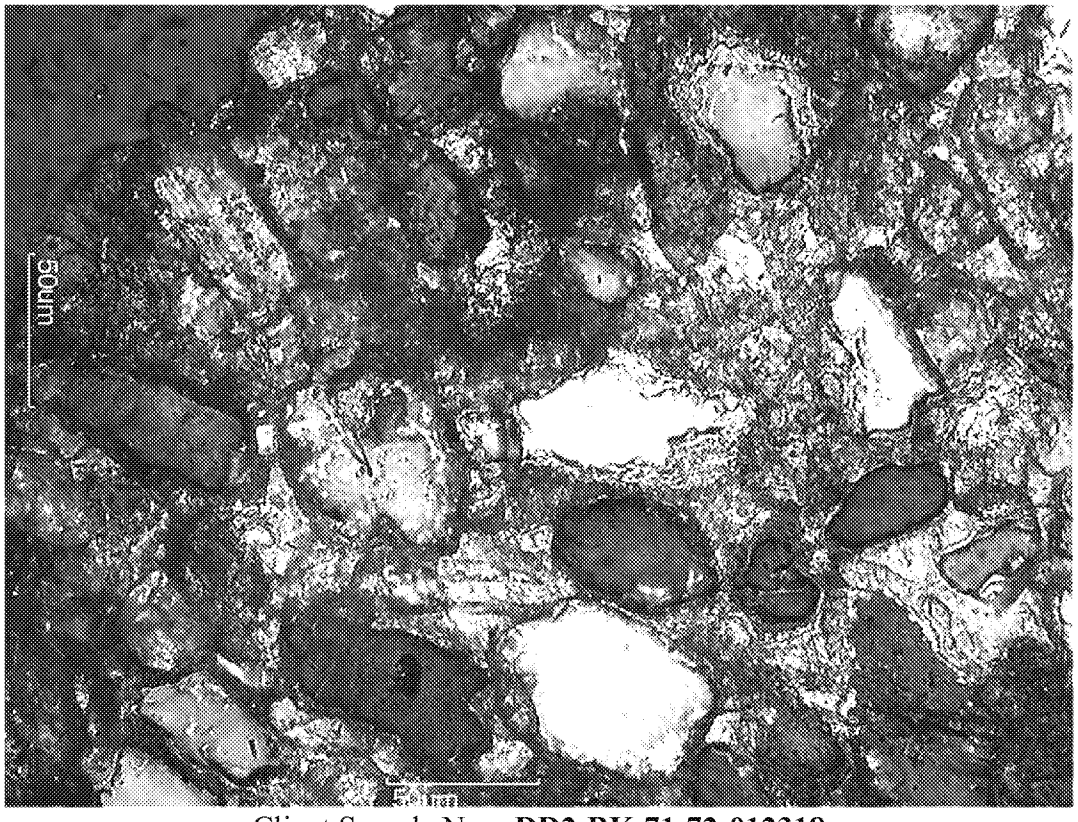
Client Sample No.: **DD2-BK-51-52-012318**

Backscatter image showing barite with an odd worm-like morphology in clay – 8,350X.

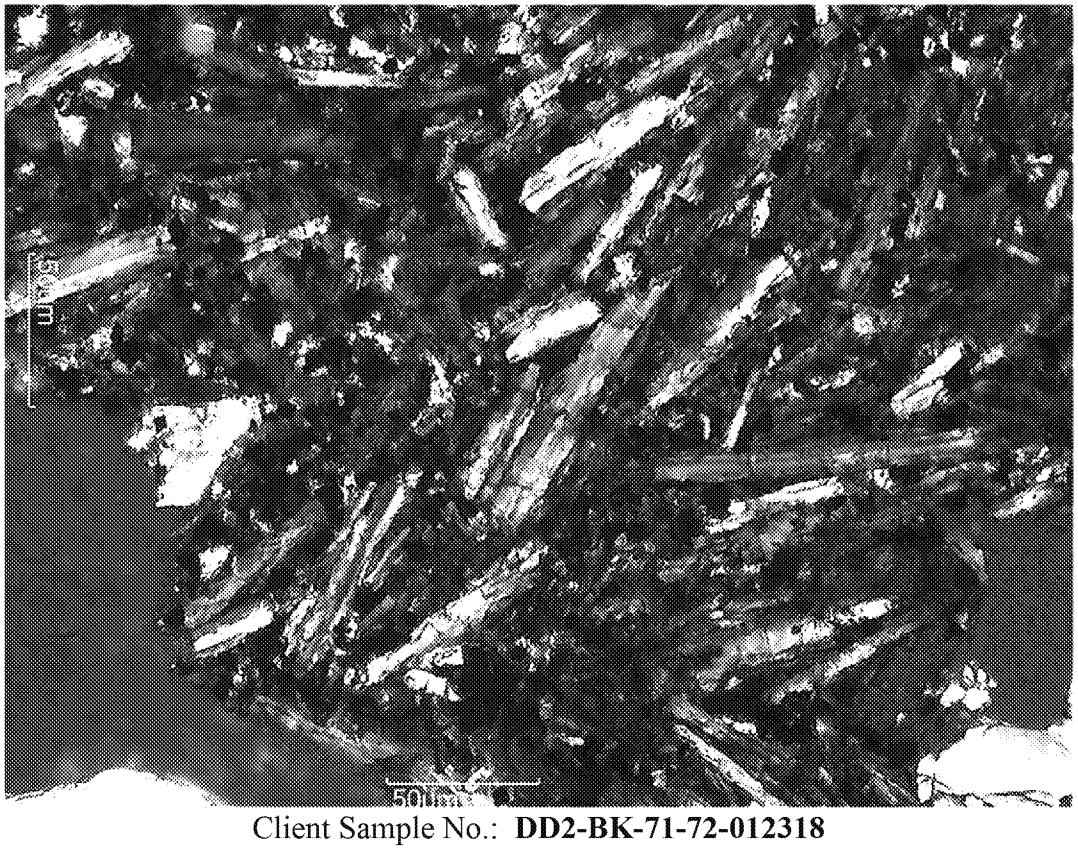


Client Sample No: **DD2-BK-71-72-012318**

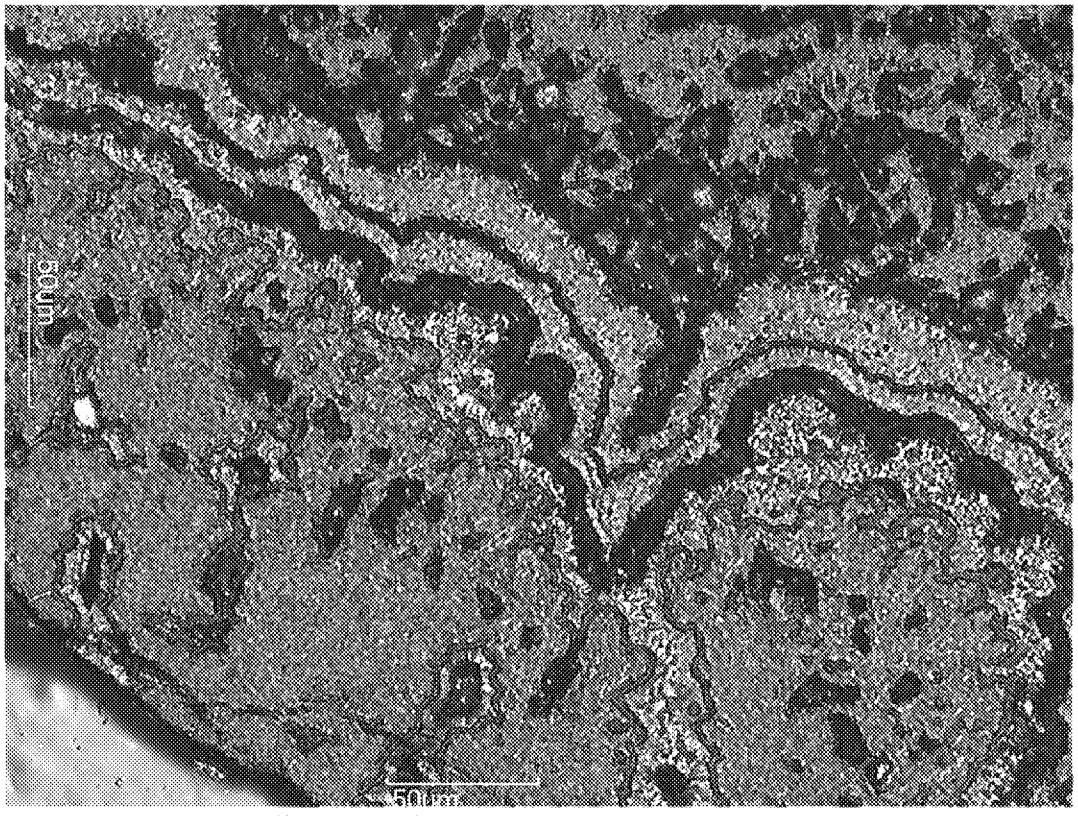
The sample is a rusty colored, fine to coarse gravelly sand with several large, rounded rock fragments up to 3cm in size. The majority of larger rock fragments are strongly indurated fine grained arkosic sandstones cemented by a combination of iron oxide, carbonate and clay. Other rock types include rounded basalt fragments composed of fine grained lath shaped plagioclase and multimineral igneous rock fragments of quartz and feldspar. XRD and petrographic studies indicate the primary component of the sediment is quartz (~70%). Individual grains vary from angular to well rounded grains that vary significantly in size from 5µm to several millimeters. Approximately 2% of the silica is fine grained, multi-colored fragments of microcrystalline chert with similar size measurements. Potassium feldspar (~12%) is primarily angular to sub-rounded orthoclase and lesser amounts of grid twinned microcline with a grain size of 5µm to 1mm. When associated with igneous rock fragments the K-spar is fairly coarse and shows some subhedral outlines. Plagioclase (~8%) occurs as angular to sub-rounded grains and has a bulk composition ranging from albite to labradorite. Labradorite is seen in fragments of basalt where it occurs as fine grained, euhedral, lath shaped crystals. Clay is present in low amounts and includes illite/mica (~3%), kaolinite (~1%) and smectite (~1%). The clays are seen coating most of the hard silicates as well as acting as a cement. Other silicates in the sample include zircon, corroded and iron oxide altered amphibole and some dark mica. Calcite (~3%) occurs as liberated fragments up to 2mm and as fine-grained aggregates mixed with iron oxide. Although XRD indicates hematite at approximately 1%, petrographic studies estimate the iron oxide at roughly 2-3% suggesting much of the oxide is amorphous. Iron oxide occurs as colloform masses, small rosettes, thin coatings on other phases and as pseudomorphs after pyrite. Other oxides include traces of rutile, leucoxene, magnetite and ilmenite. Although sulfides in this sample are rare, FE-SEM/EDS identified one small rod-shaped grain of a Pb-Sb-S in a fragment of feldspar, a thin seam of unaltered pyrite in quartz and some relict pyrite in iron oxide. Barite is present as trace and is only seen as small inclusions in quartz/feldspar. A couple of small grains of native Au were identified as minute inclusions in quartz. Rare earth phosphates are present as small grains in clay and as inclusions in quartz/feldspar. Some contain low levels of Th. U was not identified.



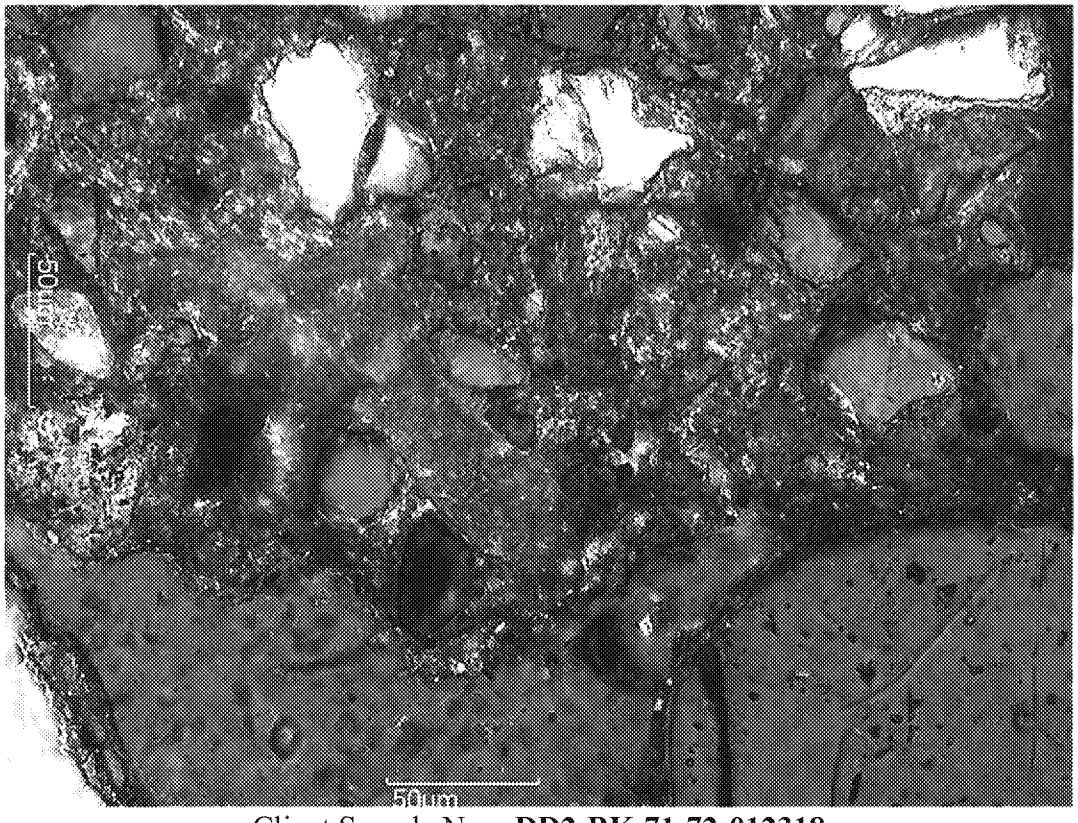
Client Sample No.: **DD2-BK-71-72-012318**
Calcite and iron oxide cement quartz/feldspar grains. Reflected light crossed Nichols – 200X.



Client Sample No.: **DD2-BK-71-72-012318**
Fragment of basalt showing lath shaped plagioclase. Polarized light – 200X.



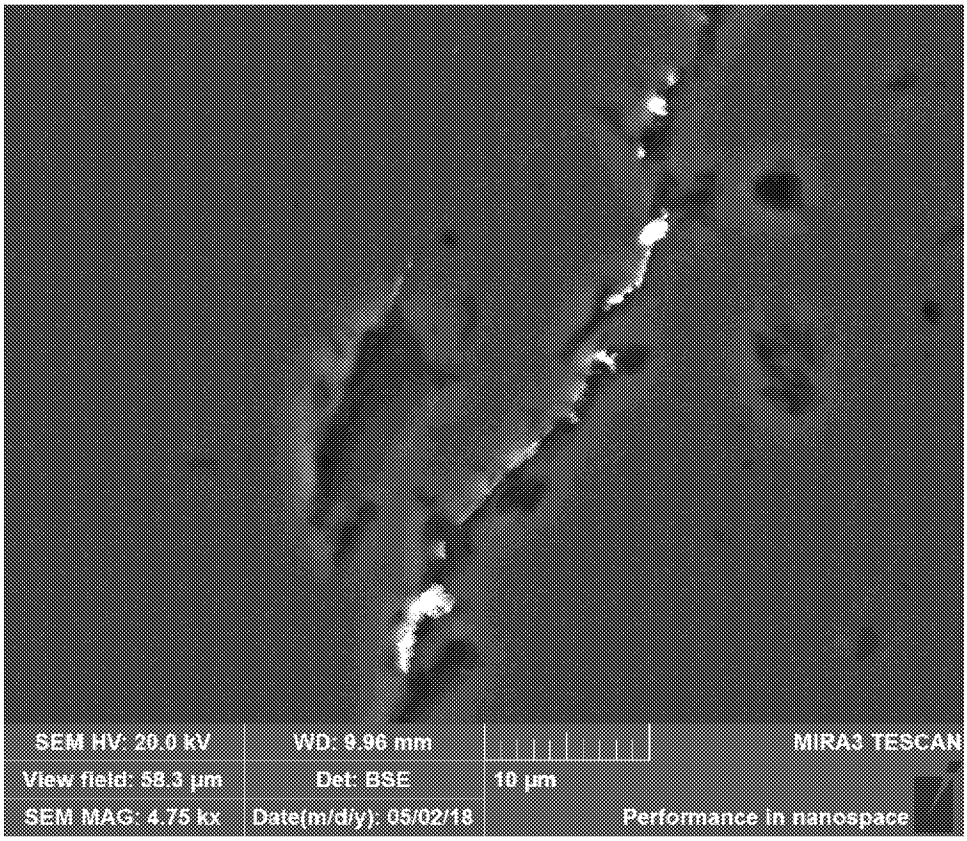
Client Sample No.: **DD2-BK-71-72-012318**
Large liberated fragment of banded iron oxide. Reflected light – 200X.



Client Sample No.: **DD2-BK-71-72-012318**
Clay mixed with iron oxide cement quartz/feldspar grains. Polarized light – 200X.

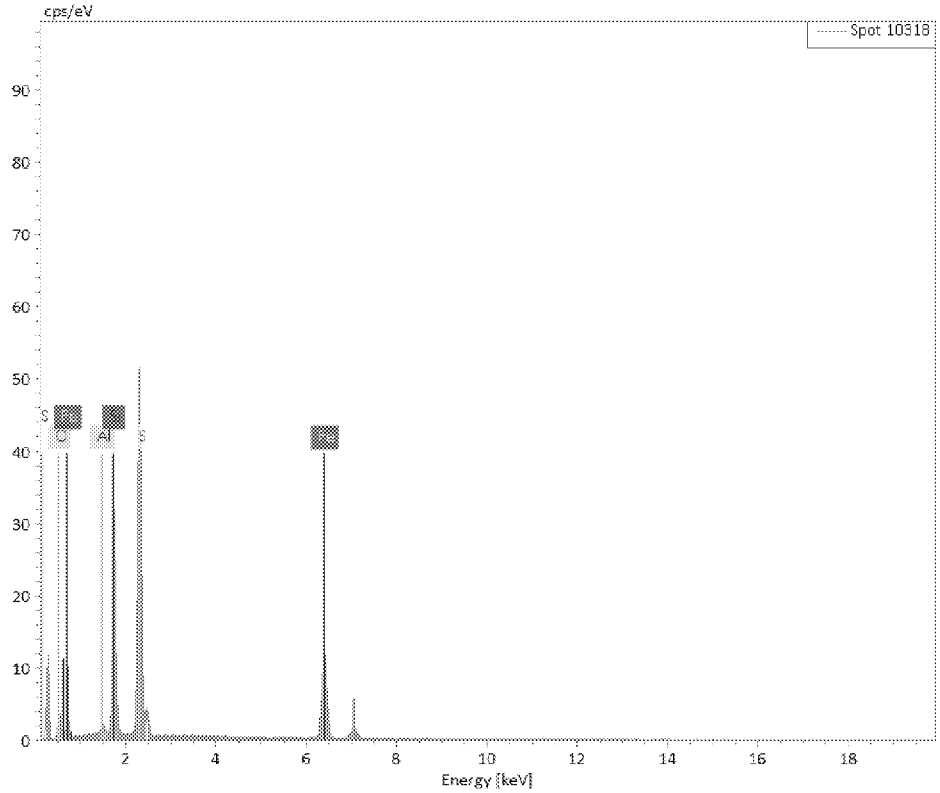
Client Sample No.: **DD2-BK-71-72-012318**

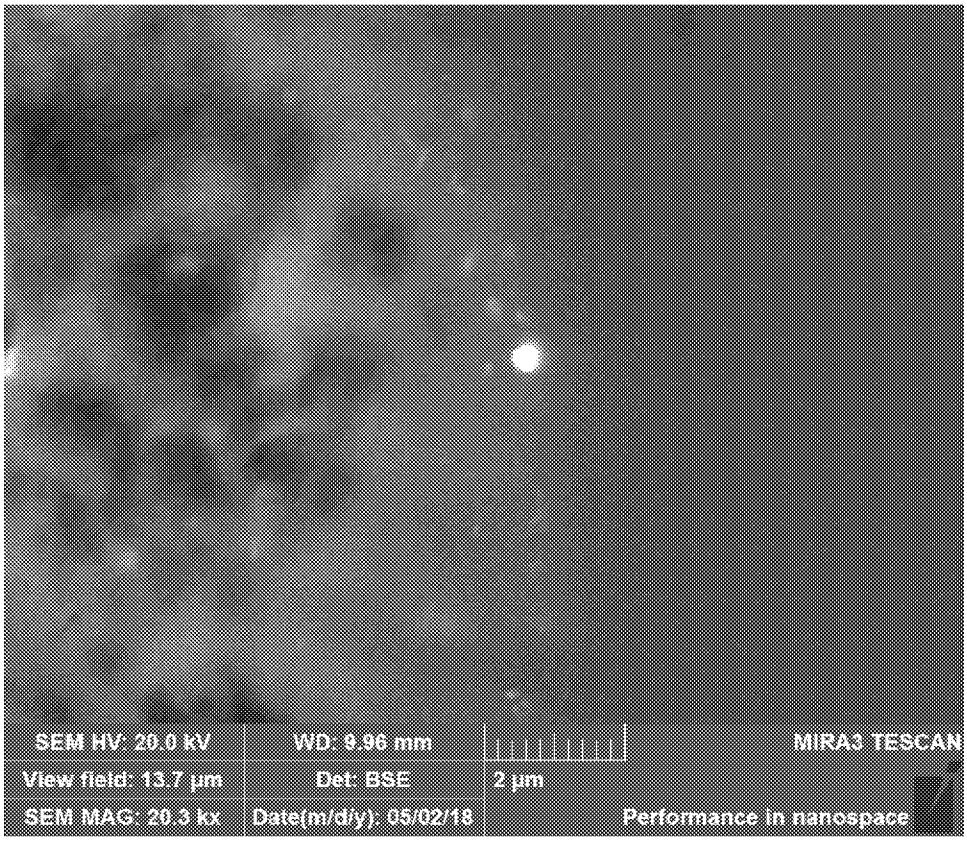
Large fragment of calcite with a seam of secondary iron oxide. Reflect light crossed Nichols – 200X.



Client Sample No.: **DD2-BK-71-72-012318**

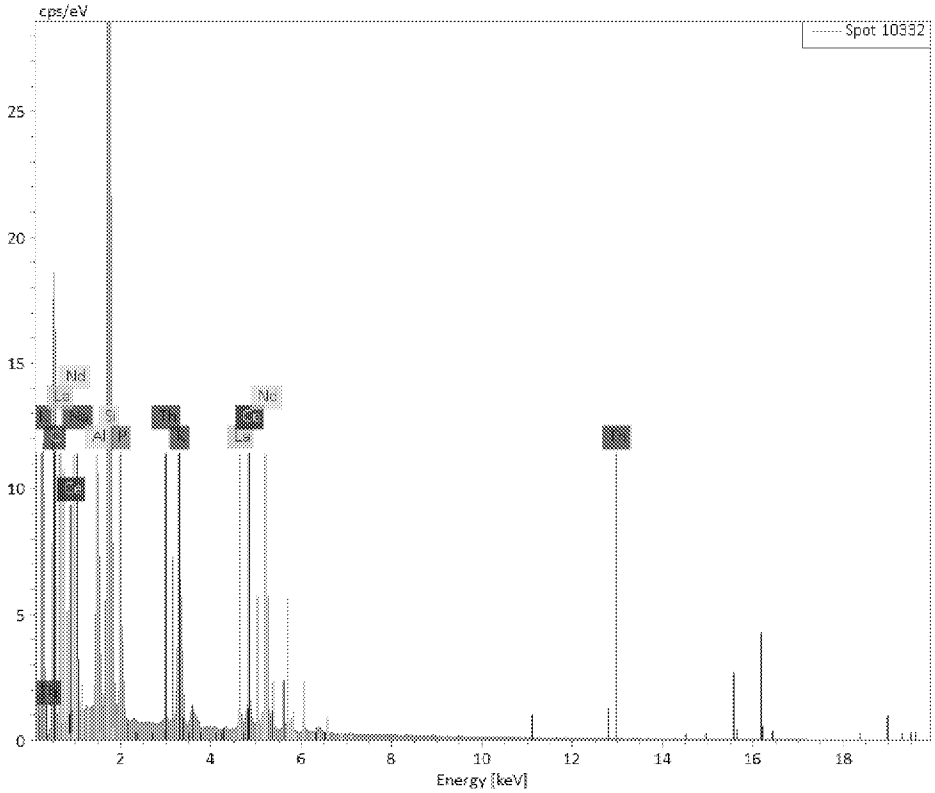
Backscatter image of quartz with a thin seam of pyrite – 4,750X.

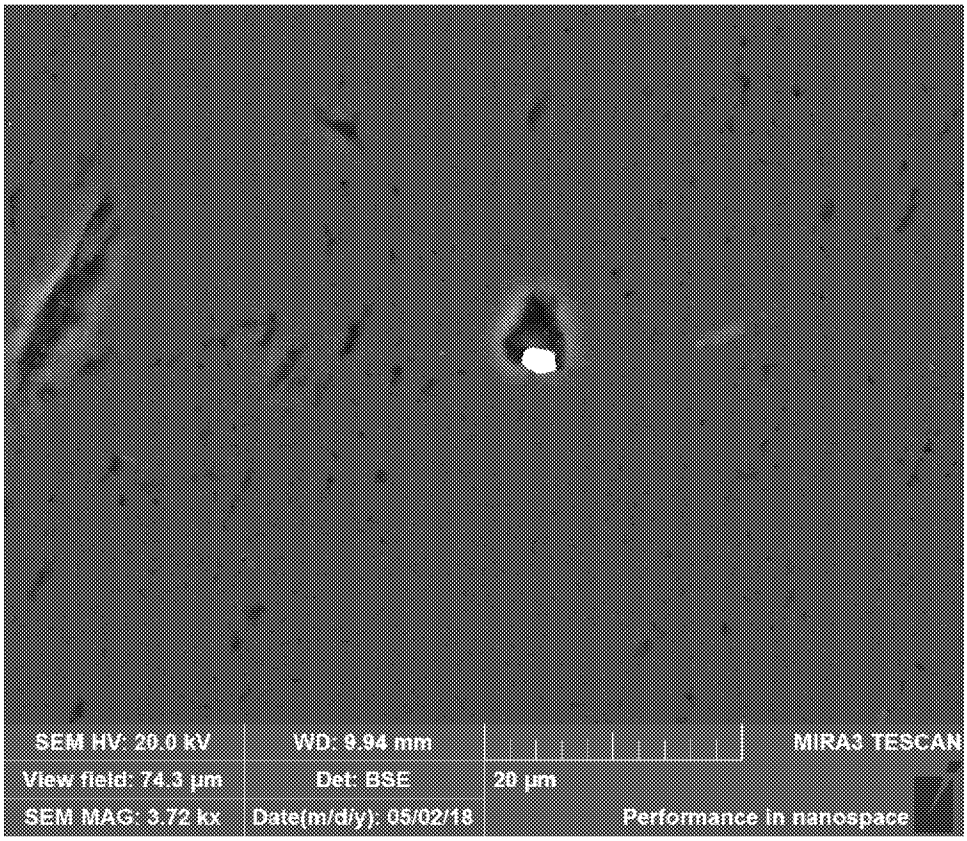




Client Sample No.: **DD2-BK-1-71-012318**

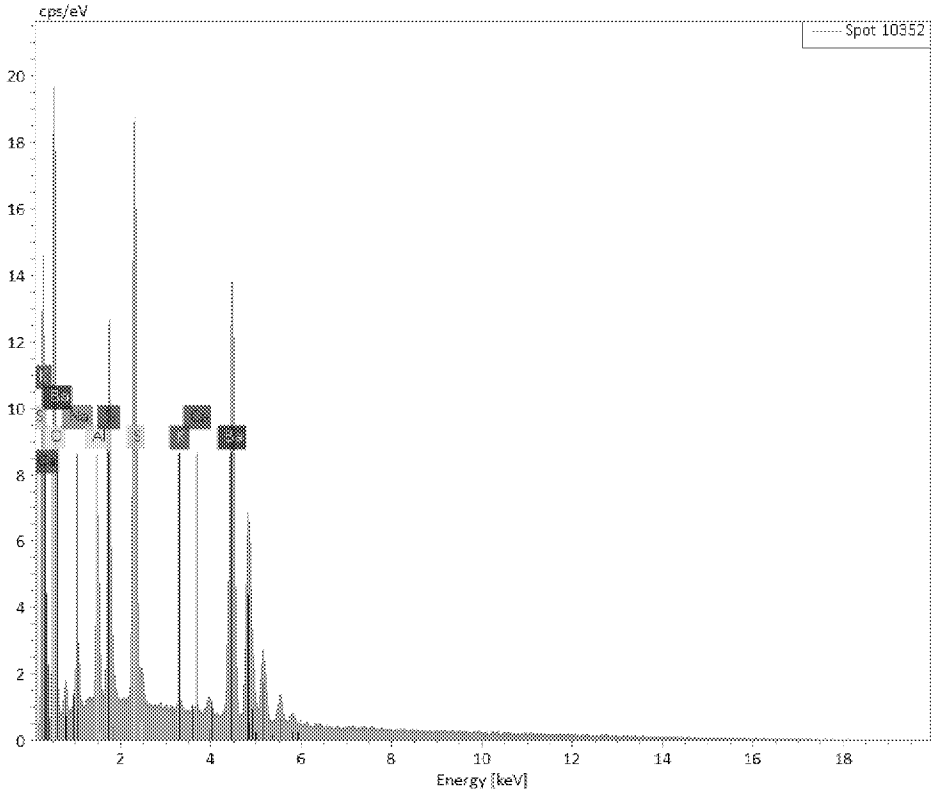
Backscatter image of feldspar with a minute rare earth phosphate with low Th content - 20,300X.

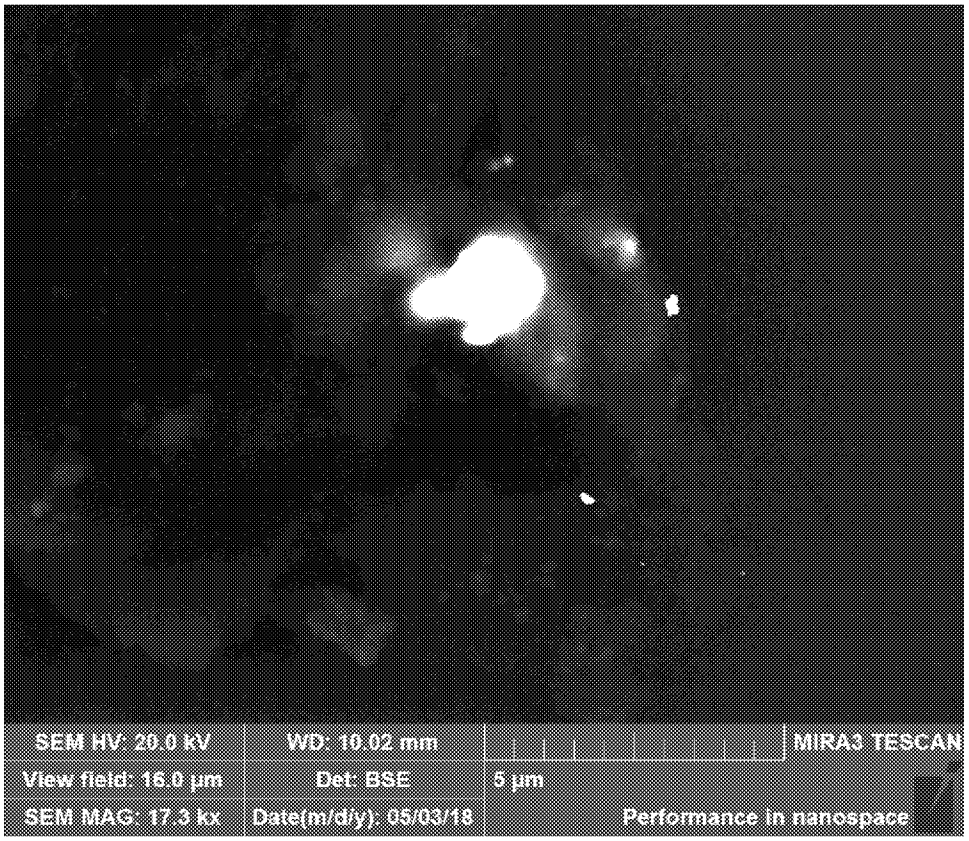




Client Sample No.: **DD2-BK-71-72-012318**

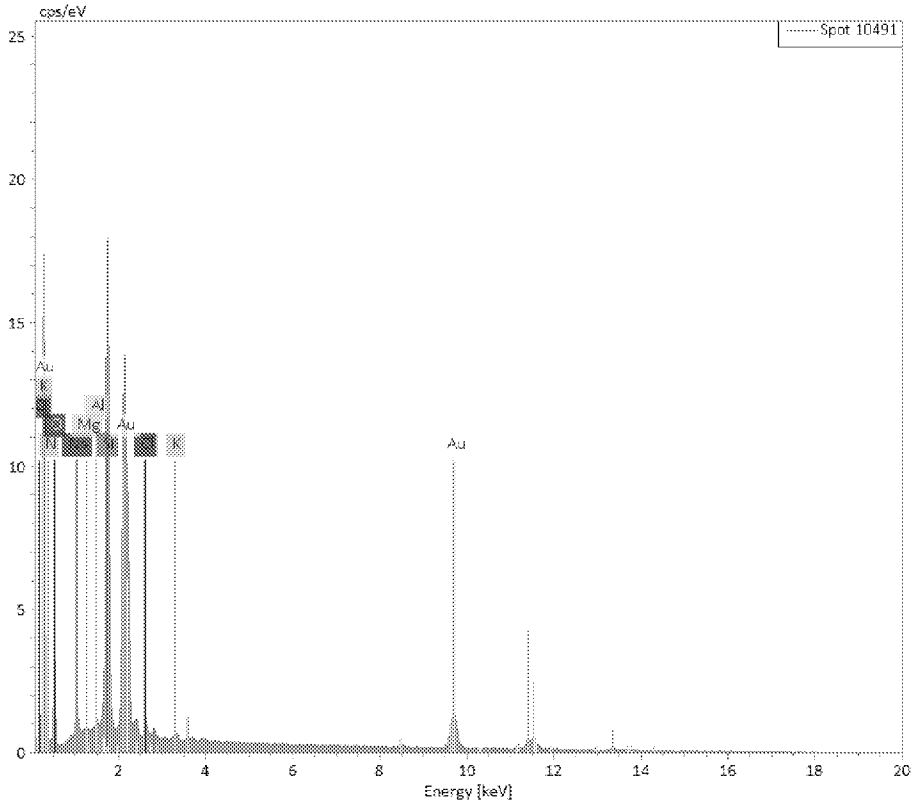
Backscatter image showing a bright grain of barite sitting in a small feldspar vug – 3,720X.

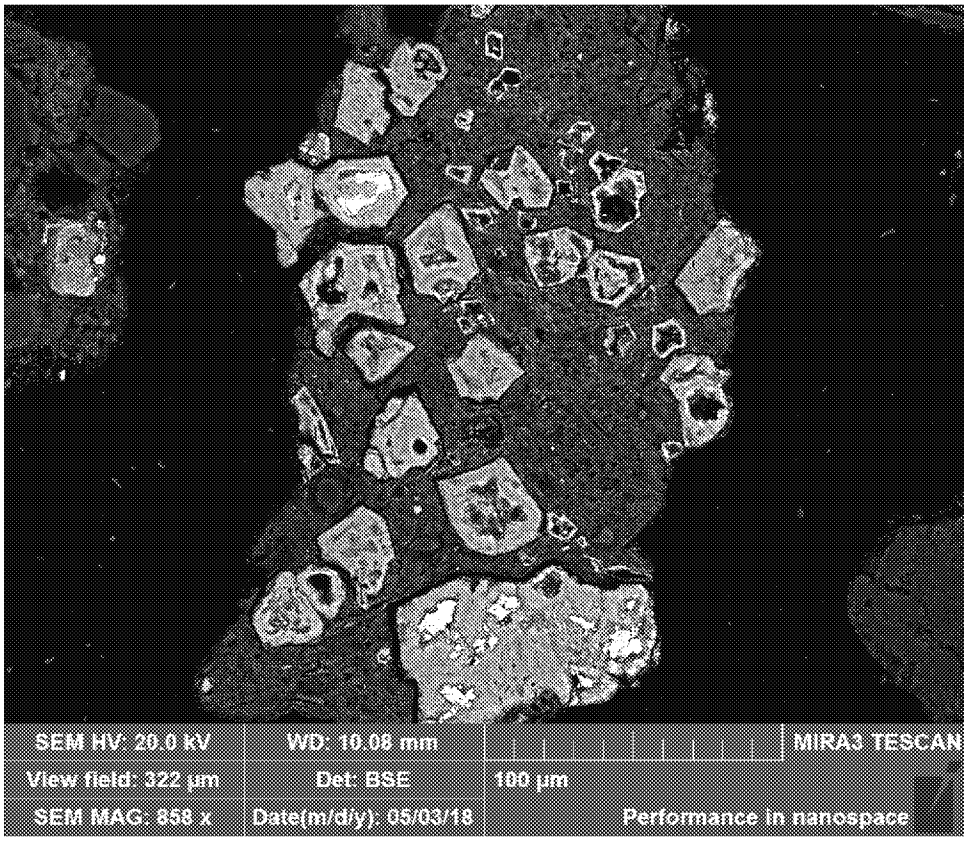




Client Sample No.: **DD2-BK-71-72-012318**

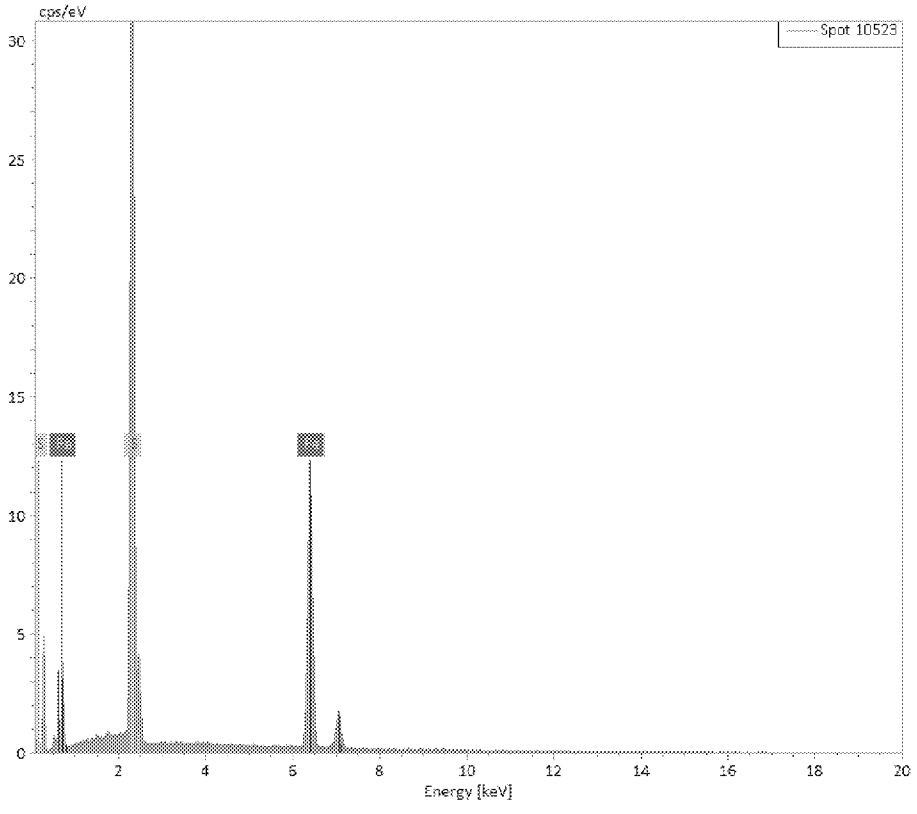
Backscatter image showing a bright grain of Au included in quartz – 17,300X.

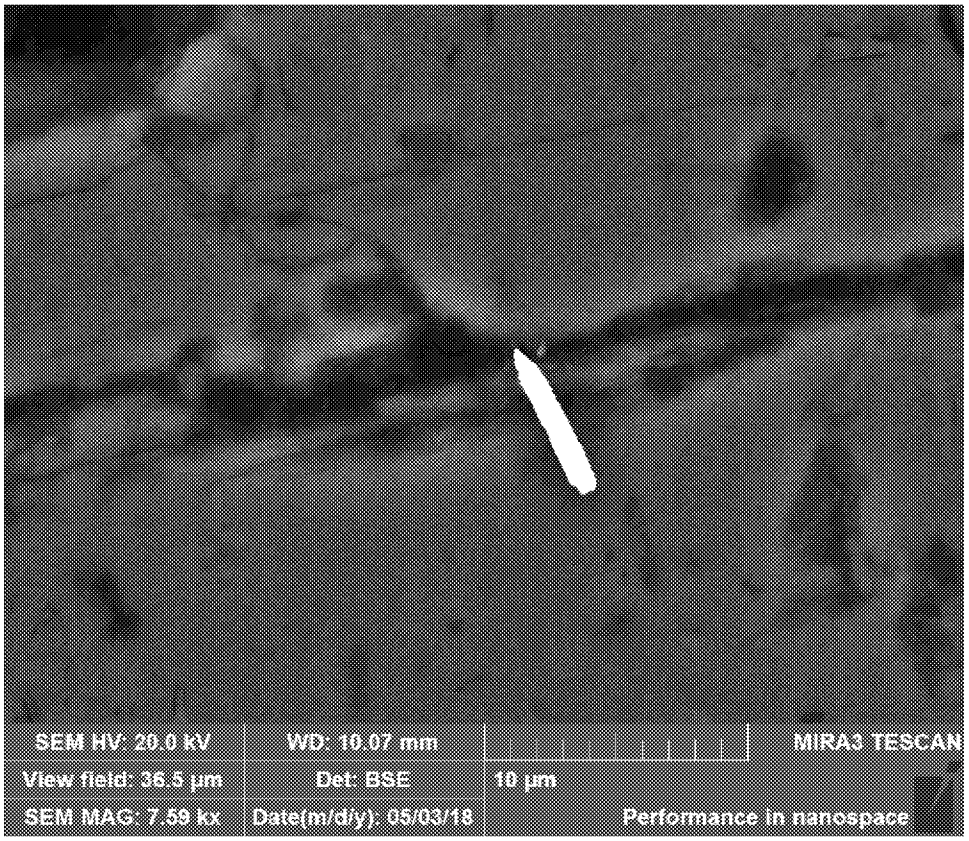




Client Sample No.: **DD2-BK-71-72-012318**

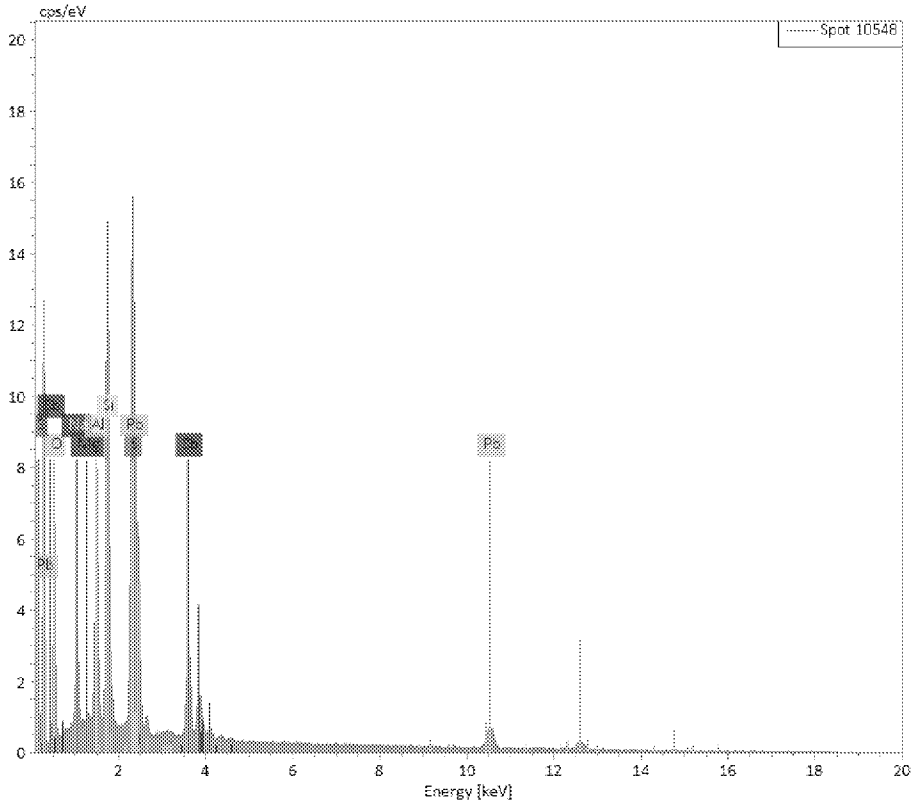
Backscatter image of clay mass with several goethite pseudomorphs after pyrite. Bright areas in the pseudomorphs are relict pyrite – 848X.





Client Sample No.: **DD2-BK-71-72-012318**

Backscatter image of feldspar with a bright elongated grain of lead antimony sulfide – 7,590X.



APPENDIX E

Photo Log

Photo: 1 **DD-BK Cuttings Return**	

Photo: 2 **DD-BK Clay Rich Materials with Gypsum Crystals**	

ED_004985_00011411-01199

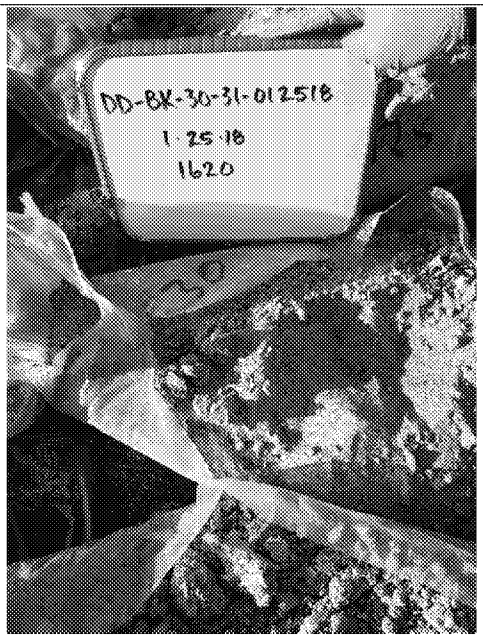
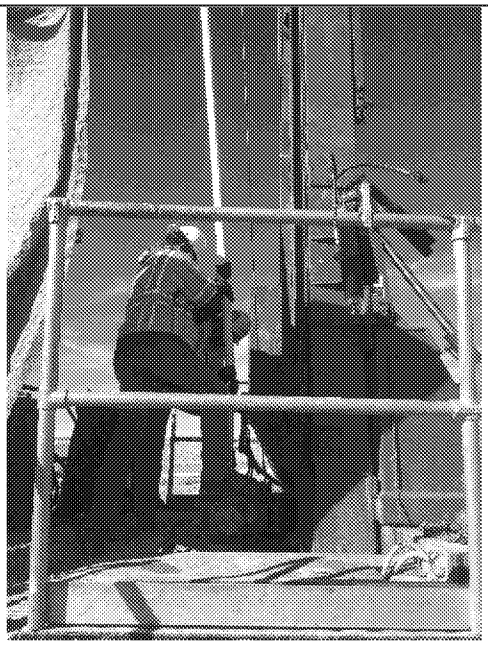
Photo: 3 **DD-BK Sand Rich Materials.**	

Photo: 4 **DD-BK Casing Installation.**	

ED_004985_00011411-01200

Photo: 5 **DD-BK Alluvium Descriptions.**	

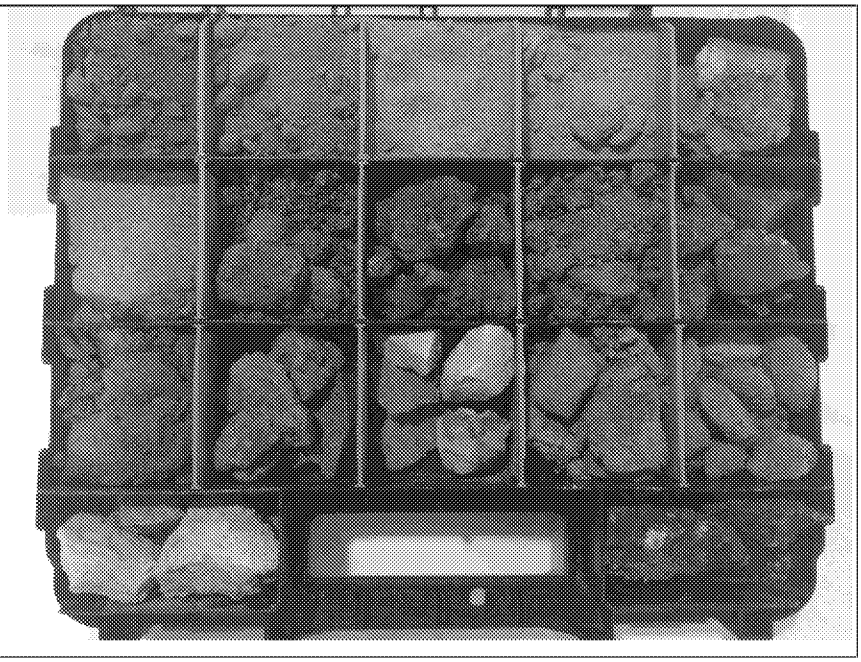
Photo: 6 **Description: DD-BK Alluvium Examples.**	

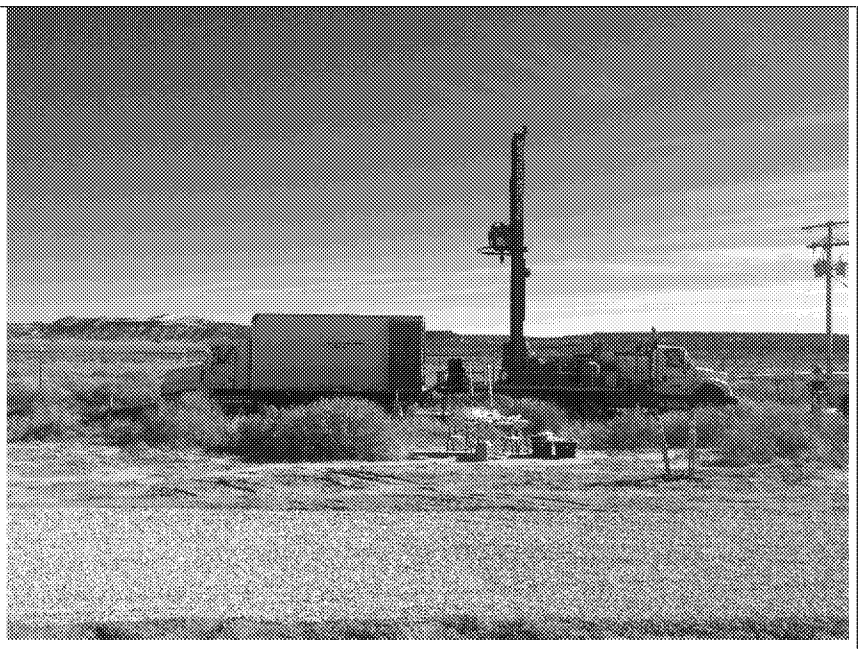
Photo: 7 **Description: DD2BK Location Looking Eastwards.**	

Photo: 8 **Description: DD2BK Location Core Inspection and Sampling.**	

ED_004985_00011411-01202

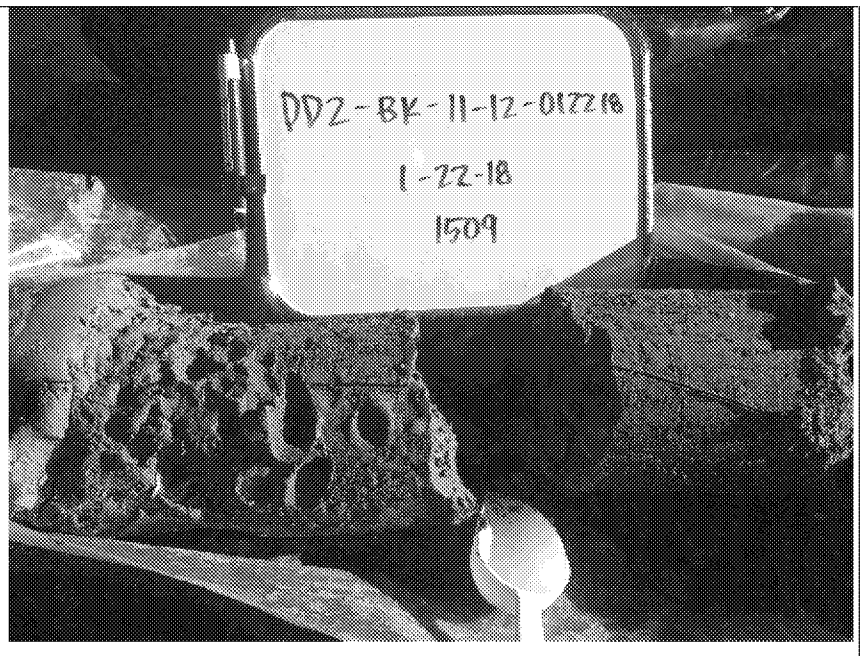
Photo: 9 **Description: DD2BK Clay Rich Materials.**	

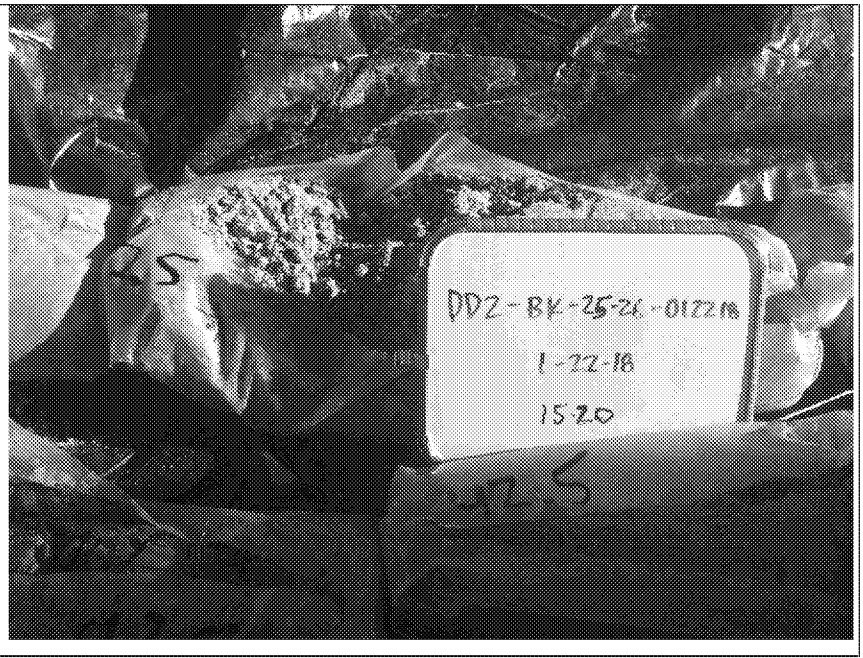
Photo: 10 **Description: DD2BK Sand Rich Materials.**	

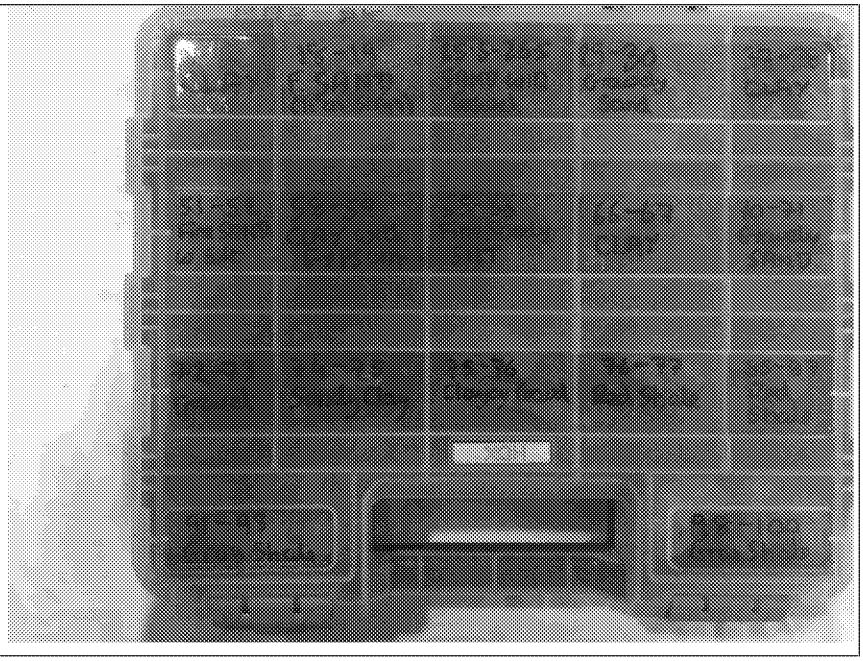
Photo: 11 **Description: DD2BK Alluvium Descriptions.**	

Photo: 12 **Description: DD2BK Alluvium Examples.**	

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Message

From: Purcell, Mark [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=FE198E260B024EB4BD9D30DC11F900B1-PURCELL, MARK]
Sent: 8/23/2019 6:21:02 PM
To: Weiss, Sherry [Weiss.Sherry@epa.gov]; Mekeel, Edward [mekeel.edward@epa.gov]
CC: Camacho, Amy [camacho.amy@epa.gov]; Jenkins, Susan [Jenkins.Susan@epa.gov]
Subject: Draft Letter for Invitational Travel - EPA September 12 2019 Albuquerque Meeting
Attachments: Invitationaltravelletter - Maest.docx

Sherry, Ed,

Please see draft letter attached.

Mark D. Purcell
Superfund and Emergency Management Division (6SF)
U.S. Environmental Protection Agency - Region 6
1201 Elm Street, Suite 500
Dallas, TX 75270
Tel: 214-665-6707
Fax: 214-665-6660

[EMBED MSPhotoEd.3]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270

Via email

Date_____

Ann Maest, PhD
P.O. Box 4132
Telluride, CO 81435

Re: Invitational Travel – September 12, 2019 EPA Meeting in Albuquerque, NM

Dear Dr. Maest:

I am writing to formally invite you to participate in the U.S. Environmental Protection Agency's (EPA's) technical meeting with the Bluewater Valley Downstream Alliance (BVDA), Multicultural Alliance for a Safe Environment (MASE), and New Mexico Environment Department (NMED). The meeting will be held on Thursday, September 12, 2019, from 11:00 a.m. to 2:00 p.m. at the NMED office, located at 121 Tijeras Avenue NE, Albuquerque, New Mexico, 87102.

The meeting is being held to continue our discussions on ground water characteristics at the Homestake Mining Company Superfund site (Site), located in Grants, NM. A summary of the results from the 2019 Supplemental Background Study by ARCADIS, a consultant for Homestake, will be discussed, along with an overview of the wells originally selected for Homestake's 2006 background determination. The meeting is a follow-up to the meeting held between EPA, NMED, and BVDA/MASE in Albuquerque on June 18, 2019, where Dr. Tom Myers and you gave presentations. The September 12th meeting will provide an opportunity for you to provide further technical input and expertise on the ARCADIS background study as well as interact with EPA and NMED staff in supporting the BVDA.

In appreciation of your attendance at the meeting, EPA agrees to reimburse you for travel expenses that you will incur for participating at this meeting if you agree to EPA's terms for an Invitational Traveler. The terms are as follows:

1. Travel expenses to be paid by EPA will be for transportation (*i.e.,* airfare and shuttle/taxi/uber services), lodging (one night at the Government rate) plus hotel taxes, parking, and per diem.

2. EPA will make the airline flight reservations and prepare a travel authorization for the Invitational Traveler. The Invitational Traveler does not purchase the airline ticket as EPA will pay for the ticket. The Invitational Traveler will be responsible for payment of all other travel expenses upfront with EPA providing reimbursement for those incurred expenses noted above.

3. Invitational Traveler will be responsible for arranging other modes of transportation (*i.e.,* shuttle/taxi/uber services).

4. Invitational Traveler will be responsible for promptly submitting all receipts to EPA after the trip. Invitational Traveler will also sign a travel voucher and promptly return it to EPA once it is provided to the traveler. This will assist with timely processing and payment of the travel voucher (or reimbursement of travel expenses).

I will send you an information packet containing an informational sheet with instructions regarding reimbursement. Please follow all instructions accordingly.

To get you started, you may confirm your participation by completing the attached form and return it to me via email at [HYPERLINK "mailto:Mekeel.edward@epa.gov"] so we can begin processing your travel authorization and make the flight arrangements.

A copy of the travel authorization will be provided to you. It will show the Government lodging rate and per diem for Albuquerque. I suggest inquiring with hotels to see if they offer the Government rate as you would be traveling on behalf of EPA. You might be able to show this letter as verification of your "Invitational Traveler" status.

If you have any questions, please feel free to contact me (214) 665-2252.

Sincerely,

Edward Mekeel
Community Involvement Coordinator
Superfund and Emergency Management Division

Message

From: Purcell, Mark [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=FE198E260B024EB4BD9D30DC11F900B1-PURCELL, MARK]
Sent: 2/10/2020 4:16:01 PM
To: Veasley, Sheila [veasley.sheila@epa.gov]; Weiss, Sherry [Weiss.Sherry@epa.gov]
Subject: RE: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site
Attachments: R6 Travel Request Form - Ann Maest - Invitational Traveler.pdf

Sheila,

I have attached a copy of the Travel Request Form for Ann Maest.

Mark

Mark D. Purcell
Superfund and Emergency Management Division (6SF)
U.S. Environmental Protection Agency - Region 6
1201 Elm Street, Suite 500
Dallas, TX 75270
Tel: 214-665-6707
Fax: 214-665-6660

From: Veasley, Sheila <Veasley.Sheila@epa.gov>
Sent: Monday, February 10, 2020 9:49 AM
To: Purcell, Mark <purcell.mark@epa.gov>; Weiss, Sherry <Weiss.Sherry@epa.gov>
Cc: Jenkins, Susan <Jenkins.Susan@epa.gov>; Camacho, Amy <camacho.amy@epa.gov>
Subject: RE: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site
Importance: High

Hi Mark: I missed your call, as I was assisting another traveler.

You will not be able to locate the traveler because she is not in our travel request system, however, you can type in the travelers name and complete the form, then print the form and pdf it to me and Sherry.

If you have any questions, please don't hesitate to contact me.

Thank you,

Sheila Veasley
Lead Travel Coordinator
Finance Operations Section
Office of the Comptroller
Mission Support Division
Region 6, Dallas, TX
214 665-7532

From: Purcell, Mark <purcell.mark@epa.gov>
Sent: Monday, February 10, 2020 9:21 AM

To: Weiss, Sherry <Weiss.Sherry@epa.gov>; Veasley, Sheila <Veasley.Sheila@epa.gov>
Cc: Jenkins, Susan <Jenkins.Susan@epa.gov>; Camacho, Amy <camacho.amy@epa.gov>
Subject: RE: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site

Sherry,

I cannot seem to complete the R6 Travel Request Form. It will not take the Invitational Traveler's name as it cannot locate the name in EPA's directory.

Do I put my name in that box???

What should I do?

From: Weiss, Sherry <Weiss.Sherry@epa.gov>
Sent: Monday, February 10, 2020 8:14 AM
To: Purcell, Mark <purcell.mark@epa.gov>; Veasley, Sheila <Veasley.Sheila@epa.gov>
Cc: Jenkins, Susan <Jenkins.Susan@epa.gov>; Camacho, Amy <camacho.amy@epa.gov>
Subject: RE: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site

Hi Mark,

R6 Travel can do this! Just because it is our 'first' invitational – don't worry!

Sherry

Sherry Weiss
Travel and Time Attendance Team Lead
Finance Operations Section
Mission Support Division

US EPA Region 6
1201 Elm Street, Suite 500
Renaissance Tower
Dallas TX 75270
214.665.3174 office

From: Purcell, Mark <purcell.mark@epa.gov>
Sent: Monday, February 10, 2020 8:01 AM
To: Weiss, Sherry <Weiss.Sherry@epa.gov>; Veasley, Sheila <Veasley.Sheila@epa.gov>
Cc: Jenkins, Susan <Jenkins.Susan@epa.gov>; Camacho, Amy <camacho.amy@epa.gov>
Subject: RE: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site

I will do it this morning Sherry.

I may need help from the Cincinnati travel desk on this one.

Mark

From: Weiss, Sherry <Weiss.Sherry@epa.gov>
Sent: Monday, February 10, 2020 7:45 AM
To: Veasley, Sheila <Veasley.Sheila@epa.gov>
Cc: Purcell, Mark <purcell.mark@epa.gov>; Jenkins, Susan <Jenkins.Susan@epa.gov>; Camacho, Amy <camacho.amy@epa.gov>
Subject: FW: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site

Hi Sheila,

We have our first invitational travel coming. The traveler is already listed in CONCUR (you will see she has an email address with one last name and in CONCUR it is the middle name with a different last name).

Hi Mark,
Please submit the invitational travel through the R6 Travel request form and all the supporting documentation (as we need to check if her profile needs updating). Sharepoint has had some issues – should you encounter error messages – hit the Refresh.

Thanks - Sherry

Sherry Weiss
Travel and Time Attendance Team Lead
Finance Operations Section
Mission Support Division

US EPA Region 6
1201 Elm Street, Suite 500
Renaissance Tower
Dallas TX 75270
214.665.3174 office

From: Purcell, Mark <purcell.mark@epa.gov>
Sent: Thursday, February 06, 2020 1:11 PM
To: aamaest@gmail.com
Cc: Weiss, Sherry <Weiss.Sherry@epa.gov>; Jenkins, Susan <Jenkins.Susan@epa.gov>; Weece, Adam <weece.adam@epa.gov>
Subject: RE: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site

Ann,

I think this is all you needed to do, but I will let you know.

Mark

From: aamaest@gmail.com <aamaest@gmail.com>
Sent: Thursday, February 06, 2020 12:05 PM
To: Purcell, Mark <purcell.mark@epa.gov>
Cc: Weiss, Sherry <Weiss.Sherry@epa.gov>; Jenkins, Susan <Jenkins.Susan@epa.gov>; Weece, Adam <weece.adam@epa.gov>
Subject: RE: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site

Hi Mark –

I filled out the form you sent on Tuesday (attached). Let me know if I need to make any changes or submit any other forms.

Thank you,
Ann

From: Purcell, Mark <purcell.mark@epa.gov>
Sent: Thursday, February 6, 2020 7:02 AM
To: Ann Maest <aamaest@gmail.com>
Cc: Weiss, Sherry <Weiss.Sherry@epa.gov>; Jenkins, Susan <Jenkins.Susan@epa.gov>; Weece, Adam <weece.adam@epa.gov>
Subject: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site

Ann,

Here is the formal letter for Invitational Travel.

Please send me the completed forms we discussed this week. Thank you.

Mark

Mark D. Purcell
Superfund and Emergency Management Division (6SF)
U.S. Environmental Protection Agency - Region 6
1201 Elm Street, Suite 500
Dallas, TX 75270
Tel: 214-665-6707
Fax: 214-665-6660

Message

From: Purcell, Mark [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=FE198E260B024EB4BD9D30DC11F900B1-PURCELL, MARK]
Sent: 2/6/2020 2:01:40 PM
To: Ann Maest [aamaest@gmail.com]
CC: Weiss, Sherry [Weiss.Sherry@epa.gov]; Jenkins, Susan [Jenkins.Susan@epa.gov]; Weece, Adam [weece.adam@epa.gov]
Subject: Letter for Invitational Travel - EPA/BVDA/MASE Meeting on Homestake NPL Site
Attachments: Invitationaltravelletter - Maest.docx

Ann,

Here is the formal letter for Invitational Travel.

Please send me the completed forms we discussed this week. Thank you.

Mark

Mark D. Purcell
Superfund and Emergency Management Division (6SF)
U.S. Environmental Protection Agency - Region 6
1201 Elm Street, Suite 500
Dallas, TX 75270
Tel: 214-665-6707
Fax: 214-665-6660

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270

Via email

February 6, 2020

Ann Maest, PhD
P.O. Box 4132
Telluride, CO 81435

Re: Invitational Travel – March 3, 2020 EPA Meeting in Albuquerque, NM

Dear Dr. Maest:

I am writing to formally invite you to participate in the U.S. Environmental Protection Agency's (EPA's) technical meeting with the Bluewater Valley Downstream Alliance (BVDA), Multicultural Alliance for a Safe Environment (MASE), and New Mexico Environment Department (NMED). The meeting will be held on Tuesday, March 3, 2020, from 1:00 p.m. to 5:00 p.m. at the NMED office, located at 121 Tijeras Avenue NE, Albuquerque, New Mexico, 87102.

The meeting is being held to discuss the technical reports you and Dr. Tom Myers prepared on groundwater background characteristics at the Homestake Mining Company Superfund site (Site), located in Grants, NM. The meeting is a follow-up to the meeting held between EPA, NMED, and BVDA/MASE in Albuquerque on September 12, 2019, on the Homestake/ARCADIS 2019 supplemental background study. The March 3rd meeting will provide an opportunity for you to present the findings of your study to EPA and NMED as well as address any questions that EPA and NMED staff may have.

In appreciation of your attendance at the meeting, EPA agrees to reimburse you for travel expenses that you will incur for participating at this meeting if you agree to EPA's terms for an Invitational Traveler. The terms are as follows:

1. Travel expenses to be paid by EPA will be for transportation (*i.e.,* airfare and shuttle/taxi/uber services), lodging (one night at the Government rate) plus hotel taxes, parking, and per diem.

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I will send you an information packet containing an informational sheet with instructions regarding reimbursement. Please follow all instructions accordingly.

To get you started, you may confirm your participation by completing the attached form and return it to me via email at [HYPERLINK "mailto:Purcell.mark@epa.gov"] so that we can begin processing your travel authorization and make the flight arrangements.

A copy of the travel authorization will be provided to you. It will show the Government lodging rate and per diem for Albuquerque. I suggest inquiring with hotels to see if they offer the Government rate as you would be traveling on behalf of EPA. You might be able to show this letter as verification of your "Invitational Traveler" status.

If you have any questions, please feel free to contact me (214) 665-6707.

Sincerely,

Mark Purcell
Remedial Project Manager
Superfund and Emergency Management Division

[EMBED MSPhotoEd.3]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270

Via email

February 4, 2020

Ann Maest, PhD
P.O. Box 4132
Telluride, CO 81435

Re: Invitational Travel – March 3, 2020 EPA Meeting in Albuquerque, NM

Dear Dr. Maest:

I am writing to formally invite you to participate in the U.S. Environmental Protection Agency's (EPA's) technical meeting with the Bluewater Valley Downstream Alliance (BVDA), Multicultural Alliance for a Safe Environment (MASE), and New Mexico Environment Department (NMED). The meeting will be held on Tuesday, March 3, 2020, from 1:00 p.m. to 5:00 p.m. at the NMED office, located at 121 Tijeras Avenue NE, Albuquerque, New Mexico, 87102.

The meeting is being held to discuss the technical reports you and Dr. Tom Myers prepared on groundwater background characteristics at the Homestake Mining Company Superfund site (Site), located in Grants, NM. The meeting is a follow-up to the meeting held between EPA, NMED, and BVDA/MASE in Albuquerque on September 12, 2019, on the Homestake/ARCADIS 2019 supplemental background study. The March 3rd meeting will provide an opportunity for you to present the findings of your study to EPA and NMED as well as address any questions that EPA and NMED staff may have.

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A copy of the travel authorization will be provided to you. It will show the Government lodging rate and per diem for Albuquerque. I suggest inquiring with hotels to see if they offer the Government rate as you would be traveling on behalf of EPA. You might be able to show this letter as verification of your "Invitational Traveler" status.

If you have any questions, please feel free to contact me (214) 665-6707.

Sincerely,

Mark Purcell
Remedial Project Manager
Superfund and Emergency Management Division

EPA 906/9-75-002

WATER QUALITY IMPACTS OF URANIUM MINING AND MILLING ACTIVITIES IN THE GRANTS MINERAL BELT, NEW MEXICO

U. S. ENVIRONMENTAL PROTECTION AGENCY
REGION VI, DALLAS, TEXAS 75201
September 1975

07001

ED_004985_00019312-00001

EPA 906/9-75-002

IMPACT OF URANIUM MINING AND MILLING ON WATER QUALITY IN THE GRANTS MINERAL BELT, NEW MEXICO

U. S. ENVIRONMENTAL PROTECTION AGENCY
REGION VI, DALLAS, TEXAS 75201

September 1975

07002

ED_004985_00019312-00002

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I. Purpose and Scope

II. Study Results

Conclusions

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Summary of Ground-Water Quality Impacts of Uranium Mining and Milling in the Grants Mineral Belt, New Mexico, U. S. Environmental Protection Agency, Office of Radiation Programs, Las Vegas Facility, Las Vegas, Nevada 89114

Impacts of Uranium Mining and Milling on Surface and Potable Waters in the Grants Mineral Belt, New Mexico, U. S. Environmental Protection Agency, National Enforcement Investigations Center, Denver, Colorado

ED_004985_00019312-00003

Purpose and Scope

In September 1974, Mr. John Wright of the New Mexico Environmental Improvement Agency requested that the staff of EPA Region VI assist in implementing a survey of the uranium mining and milling activities of the Grants Mineral Belt to determine the impact of these activities on surface and ground water in the area.

The objectives outlined for the survey were:

1. Assess the impacts of waste discharges from uranium mining and milling on surface and ground waters of the Grants Mineral Belt.

2. Determine if discharges comply with all applicable regulations, standards, permits and licenses.

3. Evaluate the adequacy of company water quality monitoring networks, self-monitoring data, analytical procedures and reporting requirements.

4. Determine the composition of potable waters at uranium mines and mills.

5. Develop priorities for subsequent monitoring and other follow-up studies.

In response to the request by the New Mexico Environmental Improvement Agency, plans were developed to conduct a joint, cooperative study involving Region VI, EPA; the Office of Radiation Programs - Las Vegas Facility (ORP-LV); the National Enforcement Investigation Center, Denver (NEIC-Denver), and the New Mexico Environmental Improvement Agency (NMEIA).

A reconnaissance was conducted in January 1975 to view the study areas, meet with mining/milling company officials, and plan the data collection effort. Sample collection began in late February 1975, and was completed in early March 1975. Laboratory analyses for trace metals, gross alpha, radium-226 analysis and other radiological analyses were completed in July 1975.

Study Results

The details of the study are presented in two reports which are appended to this summary report: Surface Water Quality Impacts of Uranium Mining and Milling in the Grants Mineral Belt, New Mexico, and Ground-Water Quality Impacts of Uranium Mining and Milling in the Grants Mineral Belt, New Mexico.

Based on the data collected and analyzed, the following conclusions and recommendations were developed.

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SUMMARY AND CONCLUSIONS

I. TASK: Assess the Impacts of Waste Discharges from Uranium Mining and Milling on Surface and Ground Waters of the Grants Mineral Belt.

1. Ground water is the principal source of water supply in the study area. Extensive development of ground water from the San Andres Limestone aquifer occurs in the Grants-Bluewater area where the water is used for agriculture, public water supply, and uranium mill feed water. Development of shallow, unconfined aquifers in the alluvium also occurs in this area. Principal ground-water development in the mining areas at Ambrosia Lake, Jackpile-Paguate, and Churchrock is from the Morrison Formation and, to a lesser extent, from the Dakota Sandstone or the Tres Hermanos Member of the Mancos Shale. The Gallup water supply is derived primarily from deep wells completed in the Gallup Sandstone using well fields located east and west of the urban area and 11 kilometers north of the city.

2. In proximity to the mines and mills and adjacent to the principal surface drainage courses, shallow ground-water contamination results from the infiltration of (1) effluents from mill tailings ponds; (2) mine drainage water that is first introduced to settling lagoons and thence to watercourses, and (3) discharge (tailings) from ion exchange plants. In the case of the Anaconda mill, seepage from the tailings ponds and migration of wastes injected into deep bedrock formations is observed in the San Andres Limestone and in the alluvium, both of which are potable aquifers. With the exception of seepage from the Kerr-McGee Section 36 mine in Ambrosia Lake, significant amounts of wastewater from the remaining mines and mills probably does not return to known bedrock aquifers. Deterioration of water quality results from conventional underground mining as a result of penetration or disruption of the ore body. The most dramatic changes are greatly increased dissolved radium and uranium. Induced movement of naturally saline ground water into potable aquifers is also likely but undocumented. Similarly, the ground-water quality impacts of solution (in situ) mining are unknown.

3. The Grants, Milan, Laguna, and Bluewater municipal water supplies have not been adversely affected by uranium mining and milling operations to date. For the Grants and Milan areas, chemical data from 1962 to the present indicate that near the Anaconda mill some observation wells have increased slightly in total dissolved solids, sulfate, chloride and gross alpha but domestic wells have generally remained unchanged. Projections made in 1957 of gross nitrate deterioration of ground water have not been substantiated by subsequent data. Of the municipal supply wells in the study area, the Bluewater well bears additional monitoring because of its location relative to the Anaconda tailings ponds.

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4. Contamination of the Gallup municipal ground-water supply by surface flows, consisting mostly of mine drainage, has not occurred and is extremely unlikely because of geologic conditions in the well field and the depth to productive aquifers. Another well field north of the City will, in no way, be affected by the drainage.

5. With the exception of the area south and southwest from the United Nuclear-Homestake Partners mill, widespread ground-water contamination from mining and milling was not observed in the study area. Throughout the study area widespread contamination of ground water with radium was not observed despite concentrations of as much as 178 pCi/l in mine and mill effluents. Radium removal is pronounced, probably due to sorptive capacity of soils in the area. In the vicinity of the Anaconda mill, radium and nitrate concentrations in the alluvial aquifer decline with distance from the tailings ponds, but neither parameter exceeds drinking water standards.

6. Ground water in at least part of the shallow aquifer developed for domestic water supply downgradient from the United Nuclear-Homestake Partners mill is contaminated with selenium. Alternative water supplies can be developed using deep wells completed in the Chinle Formation or in the San Andres Limestone. Potential well sites are located in the developments affected or in the adjacent area. A third alternative includes connecting to the Milan municipal system. Further evaluations are necessary to determine the best course of action.

7. Mining practices, per se, have an adverse effect on natural water quality. Initial penetration and disruption of the ore body in the Churchrock mining area increased the concentration of dissolved radium in water pumped from the mines from 0.05 - 0.62 pCi/l to over 8 pCi/l. According to company data, the concentration rose to over 75 pCi/l, or at least 75 times the natural concentration in the two-year period during which the mine was being developed. The pattern of increasing radium with time, also seen in Ambrosia Lake, is being repeated. Ground-water inflow via long holes in the Kerr-McGee Section 36 mine contain a relatively low concentration of dissolved radium-226. Therefore, much of the radium loading of mine effluent is apparently a result of leaching of ore solids remaining from mucking and transport within the mine. In some cases, this could be reduced by improved mining practices such as provision of drainage channels along haulage drifts.

8. Radium concentrations in Arroyo del Puerto, a perennial stream, exceed New Mexico Water Quality Criteria as a result of discharges from the Kerr-McGee ion exchange plant and Section 30W and 35 mines, and from the United Nuclear-Homestake Partners ion exchange plant. Selenium and vanadium concentrations exceed EPA 1972 Water Quality

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8. (Continued)

Criteria for use of the water for irrigation and livestock watering, and render the stream unfit for use as a domestic water source.

9. Company data show that seepage from the Anaconda tailings pond at Bluewater averages 183 million liters/year (48.3 million gallons) for 1973 and 1974. The average volume injected for the same time period was 348 million liters/year (91.9 million gallons). Therefore, approximately one-third of the total effluent volume remaining after evaporation (531 million liters/year) enters the shallow aquifer, which is a source of potable and irrigation water in Bluewater Valley. From 1960 through 1974, seepage alone introduced 0.41 curies of radium to the shallow potable aquifer. Adequate monitoring of the movement of the seepage and the injected wastes is not underway.

10. There are indications that waste injected into the Yeso Formation by the Anaconda Company are not confined to that unit as originally intended in 1960. Three nearby monitoring wells, completed in the shallower San Andres Limestone and/or the Glorieta Sandstone, show a trend of increasing chloride and uranium with time. Positive correlations of water quality fluctuations with the volumes of waste injected are a further indication of upward movement. The absence of monitoring wells in the injection zone is a major deficiency in the data collection program.

11. Rainfall and runoff at the Anaconda Jackpile Mine erode uranium- and selenium-rich minerals into Rio Paguate. This erosion can be mitigated by waste stabilization and runoff control.

12. The maximum concentration of radium observed in shallow ground water adjacent to the Kerr-McGee mill at Ambrosia Lake was 6.6 pCi/l. According to company data, seepage from the tailings ponds occurs at the rate of 491 million liters/year (130 million gallons/year). This is 29 percent of the influent to the "evaporation ponds" and attests to their poor performance in this regard. Radium and gross alpha in the seepage are 56 pCi/l and 112,000-144,000 pCi/l, respectively. Total radium introduced to the ground water to date is estimated at 0.7 curies. Wells completed in bedrock and in alluvium, and located near watercourses containing mine drainage and seepage from tailings ponds, contain elevated levels of TDS, ammonia, and nitrate. One well, which contained 1.0 pCi/l in 1962 now is contaminated with 3.7 pCi/l of radium. Sorption or bio-uptake of radium is pronounced, hence concentrations now in ground water are not representative of ultimate concentrations.

13. Water-quality data from 11 wells over a 200-square kilometer area in the Puerco River and South Fork Puerco River drainage basins reveal

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13. (Continued)

essentially no noticeable increase in concentrations of radionuclides or common inorganic and trace constituents in ground water as a result of mine drainage. Natural variations in the uranium content of sediments probably account for differences in radium content in shallow wells. Dissolved radium in shallow ground water underlying stream courses affected by waste water is essentially unchanged from areas unaffected by mine drainage. None of the samples contained more than recommended maximum concentrations for radium-226, natural uranium, thorium-230, thorium-232, or polonium-210 in drinking water. However, the paucity of sampling points and the absence of historical data make the foregoing conclusion a conditional one, particularly in the reaches of the Puerco River within approximately 10 kilometers downstream of the mines.

14. Four wells sampled in the vicinity of the Jackpile mine near Paguate contained 0.31 to 3.7 pCi/l radium-226. With the exception of the latter value from the new shop well in the mine area, remaining supplies contain 1.7 pCi/l or less radium. The Paguate municipal supply contains 0.18 pCi/l. None of the wells were above maximum permissible concentrations (MPC) for the other common isotopes of uranium, thorium, and polonium. Ground water from the Jackpile Sandstone may contain elevated levels of radium as a result of mining activities. Mine drainage water ponded within the pit contained 190 pCi/l radium and 170 pCi/l of uranium in 1970. The impacts of mining on groundwater quality downgradient from the mining area are unknown due to the lack of properly located monitoring wells. No adverse impacts from mining on the present water supply source for Paguate are expected.

15. Of the 71 ground-water samples collected for this study, a total of 6 had radium-226 in excess of 3 pCi/l PHS Drinking Water Standard. Two of the 6 involved potable water supplies. One containing 3.6 pCi/l serves a single family and is located adjacent to Arroyo del Puerto and downgradient from the mines and mills in Ambrosia Lake. The second contains 3.7 pCi/l and is used as a potable supply for the labor force in the new shop at the Jackpile Mine.

16. The highest isotopic uranium and thorium, and polonium-210 contents for any potable ground-water supplies sampled in the study area are less than 1.72% of the total radionuclide population guide - MPC as established in NMEIA regulations.

17. The lowest observed concentration (background levels) in ground water are summarized as follows:

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17. (Continued)

Radionuclides	Range (pCi/l)	Average (pCi/l)
Radium-226	0.06 - 0.31	0.16
Polonium-210	0.27 - 0.57	0.36
Thorium-230	0.013 - 0.051	0.028
Thorium-232	0.010 - 0.024	0.015
U-Natural	14 - 68	35

18. The uranium isotopes (uranium 234, 235 and 238) are the main contributors to the gross alpha result; however, in several determinations, gross alpha underestimated the activity present from natural uranium.

19. No correlation was found between gross alpha content of 15 pCi/l (including uranium isotopes) and a radium-226 content of 5 pCi/l.

20. It is doubtful that the gross alpha determination can even be used as an indicator of the presence of other alpha emitters (e.g. U-natural and polonium-210); and since the gross alpha results have such large error terms, no meaningful determination of percentage of radionuclides to gross alpha can be implied.

21. Gross alpha determinations also failed to indicate the possible presence of lead-210 (primarily a beta emitter) which, because of the lower MPC of 33 pCi/l, may be a significant contributor to the radiological health hazard evaluation of any potable water supply.

22. Radium-226 in ground water is a good radiochemical indicator of waste-water contamination from mines and mills. Due to the low maximum permissible concentration, it also provides a good means for evaluating health effects. Selenium and nitrate also indicated the presence of mill effluents in ground water. Polonium-210, thorium-230 and thorium-232 concentrations in ground water fluctuate about background levels and are poor indicators of ground-water contamination from uranium mining and milling activities.

23. For routine radiological monitoring of potable ground-water supplies, isotopic uranium and thorium and polonium-210 analyses do not appear to be necessary due to their high maximum permissible concentrations (chemical toxicity of uranium may be a significant limiting factor, however).

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II. Task: Determine if Discharges Comply with all Applicable Regulations, Standards, Permits, and Licenses.

1. At the time of sampling, the effluent from the Kerr-McGee ion exchange plant contained dissolved radium-226 at concentrations in excess of the applicable NPDES permit and New Mexico uranium-milling license conditions. This radium discharge was partly responsible for violations of New Mexico Water Quality Standards for Arroyo del Puerto, a perennial stream. The discharge also contained uranium at concentrations in excess of NPDES permit criteria. No treatment other than settling is currently in operation.

2. The Kerr-McGee Section 30W mine discharge contained dissolved radium-226 at concentrations in excess of the applicable NPDES permit condition. No treatment other than settling is currently in operation. This radium discharge also was partly responsible for violation of New Mexico Water Quality Standards in Arroyo del Puerto.

3. Kerr-McGee Nuclear Corporation has not applied for a discharge permit for their Section 35 mine, although the effluent reaches Arroyo del Puerto, a perennial stream. The discharge contains an average of 51 pCi/l of dissolved radium-226. No radium-removal treatment is currently in operation.

4. Sampling at the United Nuclear Corporation Churchrock mine was conducted when the operation was inactive due to a power failure and subsequent mine flooding. Indications are that the present treatment facility is inadequate to meet existing NPDES permit conditions.

5. Approximately 15 percent of the total flow through the United Nuclear-Homestake Partners ion exchange plant is discharged to Arroyo del Puerto, with the balance of the flow returning to the mines for in situ leaching. The discharge to Arroyo del Puerto is not regulated by an NPDES permit, and contributes to the violation of New Mexico Water Quality Standards for radium-226 in this perennial stream. Uranium is lost from the ion exchange facility. The facility is currently violating conditions of the applicable State license.

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III. Task: Evaluate the Adequacy of Company Water Quality Monitoring Networks, Self-Monitoring Data, Analytical Procedures, and Reporting Requirements.

1. Company sponsored ground-water monitoring programs range from inadequate to nonexistent. Actual monitoring networks are deficient in that sampling points are usually poorly located or of inadequate depth/location relative to the hydrogeologic system and the introduction of contaminants thereto. Compared to the multi-million dollar uranium industry, producing multi-billion liters of toxic effluents, the ground-water sampling and monitoring programs represent minimal efforts in terms of network design, implementation, and level of investment.

2. Company radiochemical analytical methods are inadequate for measuring environmental levels of radionuclides and have high minimum detectable activities and large error terms. Incomplete analysis of radionuclide contents prevails. Few data are reported on other naturally occurring radionuclides such as isotopic thorium, polonium-210, and radium-228. In some cases, monitoring has been restricted to analysis of radium-226 and natural uranium, without consideration of these other radionuclides or toxic metals.

3. Monitoring of hydraulic and water-quality impacts associated with conventional mining and with solution (in situ) mining is not reported to regulatory agencies. It is likely that such monitoring is limited to meeting short-term economic and engineering needs of the companies rather than addressing long-term, general environmental concerns. As a result, overall impacts on ground water are not routinely determined and reported.

4. Off-site ground-water sampling networks do not utilize wells specifically located and constructed for monitoring purposes. Reliance on wells already in existence and utilized for domestic or livestock use falls short of the overall monitoring objectives (i.e., to determine impacts on ground water and to adjust company operations to acceptable levels). Deficiencies of this type can allow contamination to proceed unnoticed. On-site wells constructed specifically for monitoring are generally not completed to provide representative hydraulic and water quality data for the aquifer most likely to be affected.

5. Proven geophysical and geohydrologic techniques to formulate environmental monitoring networks are apparently not used. Such techniques can assist in specifying sampling frequencies, and provide the basis for adjustment of monitoring and operational practices to mitigate adverse impacts on ground water.

6. Monitoring the effects of the Jackpile and Paguate open pit mines on ground-water quality is nonexistent, despite the magnitude of these operations. Drainage water within the pits has contained as much as 190 pCi/l. Two wells, used for potable supply and completed in the ore body contain elevated levels of radium, further indicating a need for data to determine what the future impacts might be when mining ceases and before additional programs for heap leaching and in situ mining are implemented.

7. Careful analysis of material and water balances to determine seepage input to ground water for the various tailings disposal operations is not evident. For the Anaconda Company, the method utilized has not been altered in 14 years. For Kerr-McGee, overland flow presents a potential threat to the structural integrity of the retention dams. At the United Nuclear-Homestake Partners Mill, no quantitative estimates of seepage are available.

8. Records of U. S. Atomic Energy Commission (USAEC) inspection reports, mill license applications, seepage reports, etc., on file with the State appear to be incomplete and disorganized. No interpretive summary or review-type reports utilizing the monitoring data reported by industry are available from either the State or the U. S. Atomic Energy Commission files now held by the State. Liberal mill licensing conditions with respect to ground-water monitoring and water-quality impacts were initially established by the USAEC. Subsequently, there has been essentially no review, in any critical sense, of company operations with respect to ground-water contamination. The uranium mining and milling industry has not been pressed to monitor and protect ground-water resources. The limited efforts put forth by industry to date have largely not been reviewed by regulatory agencies at the State and Federal levels.

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IV. Task: Determine the Composition of Potable Waters at Uranium Mines and Mills.

1. Four industry potable water supply systems, obtained from mine waters, exceeded 1962 U. S. Public Health Service Drinking Water Standards for selenium. Three such potable systems exceeded both the existing USPHS and proposed EPA Interim Primary Drinking Water Standards for radium. Such mine water is supplied as potable to families of miners at the United Nuclear Corporation Churchrock mine. These conditions are considered intolerable as they bear on the long-term health of those using the supplies. Non-potable systems at the Kerr-McGee mill and Churchrock mine have high radium and selenium concentrations, and are not adequately marked as non-potable.

V. Task: Develop Priorities for Subsequent Monitoring and Other Follow-up Studies.

See RECOMMENDATIONS

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RECOMMENDATIONS

Action Required

1. Procedures be initiated to require United Nuclear Corporation to immediately provide potable water which meets Federal Drinking Water Standards for their Ambrosia Lake and Churchrock operations.

2. Procedures be initiated to require Kerr-McGee Nuclear Corporation to immediately provide potable water supplies which meet Federal Drinking Water Standards at their mill and Section 35 and 36 mines; the mill and Churchrock mine non-potable water supplies be clearly marked.

3. NMEIA initiate appropriate action to insure safe industrial potable water supplies at the United Nuclear Corporation's Ambrosia Lake and Churchrock operations and at the Kerr-McGee Nuclear Corporation's mill and Section 35 and 36 mines.

4. NMEIA should conduct periodic sampling of potable water supplies at operating uranium mines and mills throughout the State.

5. Improved industry-sponsored monitoring programs should be implemented and the data made available to State and Federal Regulatory Agencies. Programs should be designed to detect likely hydraulic and water quality impacts from uranium milling and mining (open pit, underground, in situ). Revamped programs, specifically developed by joint concurrence of industry and regulatory agencies, should be incorporated in licenses, where possible. Licenses should specify minimal radiochemical analytical methods for detecting specific radionuclides as well as requirements for participation in quality assurance programs. Specific reporting procedures should include raw data, summary reports, and interpretations of data. Conclusions concerning impacts of operations on ground-water quality and remedial steps taken to abate or eliminate adverse impacts should be prepared. It is essential that the programs developed, as well as the data and interpretive reports prepared therefrom, be critically reviewed by the State to meet continuing regulatory responsibilities.

6. Because seepage from the Anaconda and Kerr-McGee tailings ponds constitutes a significant portion of the inflow to the ponds, it is recommended that seepage control measures be adopted. According to company records, such seepage presently totals some 674 million liters per year. Water budget analyses of the United Nuclear-Homestake Partners tailings pond should be made to determine how much seepage is occurring and thereby contributing to contamination of the shallow aquifer locally developed for domestic water supplies in two adjacent privately owned housing developments.

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7. Improved mining practices should be adopted to reduce the amount of radium leached from ore solids by ground water present in operating mines.

8. Procedures should be initiated to require Anaconda Company to improve its present efforts at stabilizing waste and ore piles at the Jackpile Mine in order to prevent water erosion from transporting uranium and selenium into Rio Paguate.

9. Procedures be initiated to require Kerr-McGee Nuclear Corporation to immediately install necessary treatment systems to reduce the dissolved radium-226 concentration in the Section 30W mine discharge to applicable NPDES permit conditions.

10. Procedures be initiated to require Kerr-McGee Nuclear Corporation to file an application for discharge from their Section 35 mine. The permit should provide limits on total suspended solids, radium-226 and uranium, consistent with the permit conditions for the Section 30W mine.

11. Procedures be initiated to require Kerr-McGee Nuclear Corporation to immediately install necessary treatment systems to ensure that effluent from their ion exchange plant meets applicable NPDES permit and State uranium-milling license conditions. The Company should develop operating schedules to guard against undetected uranium breakthrough and subsequent discharge of uranium to Arroyo del Puerto.

12. United Nuclear-Homestake Partners should install necessary pumps and pipe lines necessary to achieve complete recycle of ion exchange discharge. If unable to accomplish this, it will be necessary to apply for an NPDES permit, and immediately install necessary treatment facilities to come into compliance with the applicable State uranium-milling license.

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ADDITIONAL STUDIES REQUIRED

1. Studies should be immediately initiated to verify whether the source of ground-water contamination in the Broadview Acres and Murray Acres subdivision is from the nearby uranium mill. A sound monitoring program should be developed to predict contaminant migration and to provide the basis for subsequent enforcement action. Necessary action should be taken to provide potable water for the affected area. Studies should be undertaken to determine the means to prevent continuing contamination.

2. With regard to the Anaconda waste injection program, all available chemical and water level data for pre-injection and post-injection periods should be evaluated to ascertain if waste is migrating out of the Yeso Formation and into overlying aquifers containing potable water. Of particular concern are radium-226 and thorium-230 because of their abundance in the injected fluid. Limited chemical data indicating migration of waste beyond the injection interval necessitate that a thorough re-evaluation be made of the long term adequacy of this method of waste disposal. Construction of additional monitoring wells in the Yeso Formation and the Glorieta-San Andres is in order. Because of low MPC values, this is particularly true if increasing concentrations of radium-226 and possibly lead-210 are appearing in the aquifers above the injection zone. The Anaconda Company should also evaluate the current loss of uranium resources to the subsurface through their current disposal technique.

3. Available chemical data for ground-water samples collected by Kerr-McGee from wells located adjacent to Arroyo del Puerto and San Mateo Creek should be evaluated for long-term trends in water quality. Data for the Wilcoxson (P. Harris), Bingham, Marquez, and County Line Stock Tanks wells are of principal concern.

4. Water-quality data from the newly completed monitoring wells peripheral to the Kerr-McGee mill should be cross-checked using non-industry laboratories to determine the extent of contamination in the Dakota Sandstone.

5. The breadth of mining and milling activities in the Grants Mineral Belt clearly requires additional study if ground-water impacts are to be understood in any detailed or quantitative sense. The present study provides a preliminary assessment of but a small facet of the overall activity in the district. Further study is recommended to determine impacts of past operations or expected impacts from mines and mills now in the planning or construction stage. Site specific investigations are necessary to determine the hydraulic and water quality responses to dewatering and solution mining.

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6. Additional ground-water samples should be collected from wells adjacent to the Rio Puerco and east of Gallup to determine if radium concentrations are acceptably low and to establish baseline conditions for future reference. It is recommended that concentrations of trace metals should also be measured.

7. Resampling should be scheduled at the United Nuclear Corporation Churchrock mine during normal operations.

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Action Taken

The study was designed so that immediate action could be taken when data obtained indicated such was needed. Therefore, in June 1975, the participants in the study met to review the results available at that time and take any action that was deemed necessary to protect the public health.

The following conclusions were drawn and action taken:

1. A review of the gross alpha and radium-226 analytical results indicated a possible problem involving drinking water at the United Nuclear Churchrock Mine and Kerr-McGee 35 and 36 Mines.

   ACTION: NMEIA contacted the company officials, indicated the data at hand, and requested that action be taken to remedy the situation.

2. The preliminary data suggested the possibility of high selenium concentrations in water used for drinking at the United Nuclear Churchrock Mine and trailer park; United Nuclear Churchrock office; Kerr-McGee Mill; and Kerr-McGee Section 35 and 36 Mines.

   ACTION: NMEIA notified the companies of the preliminary data and suggested using alternate sources of drinking water.

3. Possible problems with selenium concentrations were noted in samples from shallow ground water downgradient from the United Nuclear-Homestake Partners complex.

   ACTION: NMEIA notified the company and individual well owners of the data and suggested using an alternate source of drinking water. A meeting was held by NMEIA in the Grants area to discuss the problem with persons living in the area.

   Forty additional wells were sampled to better define the problem.

4. An analysis of the data indicated a possible violation of radium discharge limits by Kerr-McGee and United Nuclear-Homestake Partners Mills.

   ACTION: NMEIA is in the process of reviewing each license to determine compliance with license requirements.

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5. Three NPDES permits have been issued in the Grants Mineral Belt: Kerr-McGee Churchrock; Kerr-McGee Ambrosia Lake and United Nuclear Churchrock. Kerr-McGee has asked for adjudicatory hearings on their two permits.

   ACTION: Region VI, EPA has issued notice of the hearings and will be holding the hearings as soon as possible. Violations of permit requirements at the United Nuclear Churchrock facility have been reported and appropriate enforcement action is underway.

Various follow-up actions will be taken by EPA and NMEIA to ensure that the recommendations as listed are carried out. The close working relationship that has been developed between the State and EPA will be continued to ensure that the surface and ground-water resources in the Grants Mineral Belt are fully protected.

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Applicable Laws and Regulations

There are a number of Federal and State authorities which call for the regulation and control of water quality. Specifically the discharge of wastes to surface or ground waters from uranium mining and milling operations are subject to a number of regulations as follows:

New Mexico Water Quality Standards

The New Mexico Environmental Improvement Agency maintains that the State's general water quality standards that govern radioactive discharges applies to uranium milling and mining activity. This regulation sets a maximum concentration of 30 pCi/l of dissolved radium-226 in water.

National Pollutant Discharge Elimination System (NPDES) Permits

The Federal Water Pollution Control Act, as amended, provides that discharge of any pollutant by any person into navigable waters shall be unlawful except in compliance with various sections of the Act. EPA has consistently interpreted its authority over pollutants under this Act to include authority over radioactive materials not covered by the Atomic Energy Act of 1954, as amended, e.g., radium and accelerator produced isotopes. However, the Agency had determined that it did not have authority over radioactive materials within the NRC's jurisdiction; i.e., source materials - uranium, thorium, and other material designated as essential to the production of special nuclear material and their ores; special nuclear material - plutonium, enriched uranium, and other designated material capable of releasing substantial quantities of atomic energy; and by-product material - material yielded or made radioactive in the production or utilization of special nuclear material. This determination of limited EPA authority was overruled on December 9, 1974, by the U. S. Court of Appeals for the Tenth Circuit in the case of Colorado Public Interest Research Group v. Train. The Court found that all radioactive materials are pollutants under the Federal Water Pollution Control Act and subject to EPA's authorities under that Act. The U. S. Supreme Court has agreed to review this decision.

Uranium Milling Licenses

Title 10 C.F.R. Part 20 provides that all persons "who receive, process, use, or transfer.....source material" shall be controlled by general or specific licenses issued by the U. S. Atomic Energy Commission (succeeded by NRC), or any State conducting a licensing program. Under this regulation, all ion exchange plants and uranium mills are licensed by NMEIA.

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Uranium Milling Licenses (Continued)

Mining activities, however, do not appear to be licensed by NMEIA but probably would be covered by the NPDES program.

Potable Water Requirements

Under the Safe Drinking Water Act, EPA has the authority to:

a. Propose and promulgate national primary and secondary drinking water regulations, including maximum contaminant levels covering radioactive materials.

b. Propose and promulgate regulations for State or Federal underground injection control programs, including requirements concerning underground injection of radioactive materials.

The State is primarily responsible for enforcement of the regulations.

The Act extended Federal control over many potable water supply systems. Previously only those systems used in interstate commerce were required to meet U. S. Public Health Service Drinking Water Standards. The latest issue of the USPHS standard sets a limit of 3 pCi/l for radium-226 and 0.01 mg/l for selenium.

The Safe Drinking Water Act applies to all public systems supplying water to fifteen service connections or at least 25 individuals unless the system is exempt under four specific criteria. The industrial potable water supply systems in the Grants Mineral Belt are covered by this Act. Proposed standards will call for 5 pCi/l for radium, 15 pCi/l gross alpha, and 0.01 mg/l selenium.

Section 1431 of the Act also provides that the Administrator, "upon receipt of information that a contaminant which is present in or is likely to enter a public water system may present an imminent and substantial endangerment to the health of persons, and that appropriate State and local authorities have not acted to protect the health of such persons, may take such actions as he may deem necessary in order to protect the health of such persons."

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ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT

IMPACTS OF URANIUM MINING AND MILLING ON SURFACE AND POTABLE WATERS IN THE GRANTS MINERAL BELT, NEW MEXICO

September 1975

NATIONAL ENFORCEMENT INVESTIGATIONS CENTER - Denver, Colorado
and
REGION VI - Dallas, Texas

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ABBREVIATIONS

AEC	Atomic Energy Commission
gpm	gallons per minute
kg	kilograms
km	kilometers
l/min	liters per minute
m^3/day	cubic meters per day
mg/l	milligrams per liter
NEIC	National Enforcement Investigations Center
NMEIA	New Mexico Environmental Improvement Agency
NRC	Nuclear Regulatory Commission
ORP-LVF	Office of Radiation Programs-Las Vegas Facility
pCi/l	picocuries per liter
RIP	resin in pulp (ion-exchange process)
USPHS	United States Public Health Service

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I. INTRODUCTION

BACKGROUND

The United States experienced its first uranium "boom" in the early 1950's as a result of cold-war activities and the fabrication of large numbers of nuclear weapons. During that time, most of the currently-known uranium deposits were discovered by massive exploration by the U.S. government and private citizens. Many uranium mills were built at various sites throughout the west to treat the uranium ores to produce a uranium oxide called *yellow cake*.

This uranium milling was not without environmental damage. Among the first recognized water-pollution problems was in the Animas River Basin of Colorado and New Mexico. A mill at Durango, Colorado was contributing abnormally high concentrations of radium to the water supply of Aztec, New Mexico. To control radiochemical pollution resulting from uranium milling in this area, the Colorado River Basin Enforcement Conference was convened in 1960 by the states composing the Colorado River Basin. Federal, State, and industry cooperative efforts resulted in pollution control by which streams in the Colorado River Basin contained near background levels of pollutants resulting from uranium milling. Other uranium milling areas, most notably the Grants Mineral Belt, were not situated on interstate streams and thus not subject to Federal pollution control before the Federal Water Pollution Control Act Amendments were passed in 1972. Little pollution control effort was expended toward mine and mill discharges within this area.

The Grants Mineral Belt [Fig. 1], stretching west from just northwest of Albuquerque, New Mexico to the New Mexico-Arizona state line, contains almost half of the United States uranium reserves. A second uranium "boom" now underway promises to make the Grants Mineral Belt the

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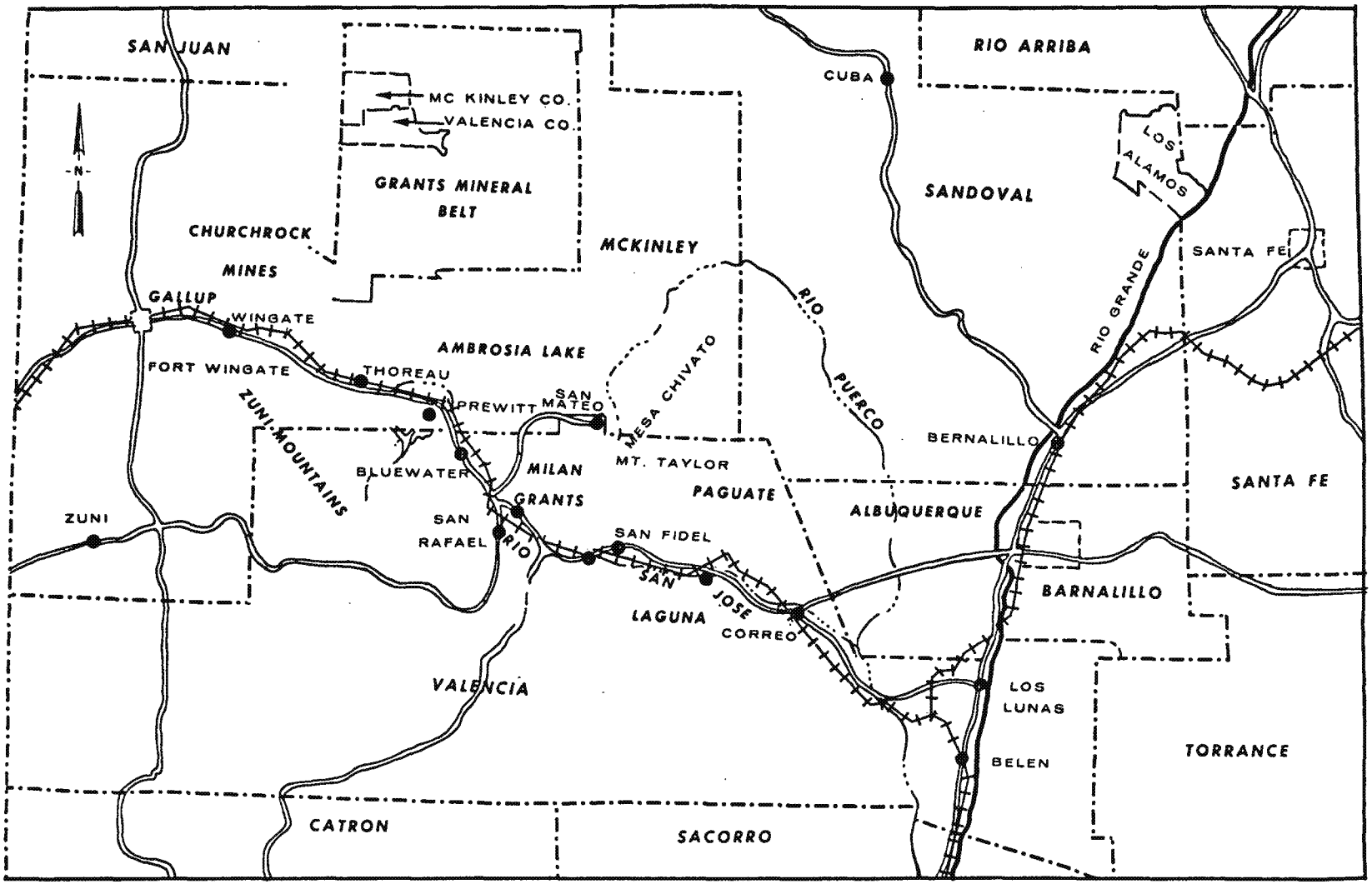

FIGURE 1. Location and General Features of the Grants Mineral Belt in Northwestern New MEXICO

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foremost uranium mining and milling site in the United States. This "boom" results from the demand for nuclear fuel elements in nuclear power plants (Guccione, Aug. 1974).

1975 WATER QUALITY INVESTIGATION

The New Mexico Environmental Improvement Agency (NMEIA) realized that little information was available on the water discharges from mining and milling in the Grants Mineral Belt, and the subsequent effect on ground and surface water resources of the area. On September 25, 1974 NMEIA requested EPA Region VI to conduct a survey of water-pollution sources and surface and ground-water quality in the Grants Mineral Belt. The National Enforcement Investigations Center (NEIC) and the Office of Radiation Programs-Las Vegas Facility (ORP-LVF) were subsequently asked by Region VI to conduct a survey in cooperation with the NMEIA.

Studies conducted from February 24 to March 6, 1975 included industrial waste source evaluation, potable water sampling, and limited stream surveys by NEIC, and ground-water evaluations by ORP-LVF. NMEIA provided assistance to both NEIC and ORP-LVF during the survey. The three mining areas evaluated in the Grants Mineral Belt were [Fig. 1]:

Area	Approximate Location
Ambrosia Lake	32 km (20 mi) N of Milan, N. Mex.
Churchrock	32 km (20 mi) NE of Gallup, N. Mex.
Paguate	16 km (10 mi) N of Laguna, N. Mex.

The mill sites are:

Kerr-McGee	near Ambrosia Lake
United Nuclear-Homestake Partners	8 km (5 mi) N of Milan
Anaconda	11 km (7 mi) W of Milan

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United Nuclear Corporation operates an ion-exchange plant in the old "Phillips" mill near Ambrosia Lake. No conventional milling is currently done at this site.

As stated in a February 14, 1975 letter from the Director of NMEIA, the primary tasks of the study were to:

1. Assess the impacts of waste discharges from uranium mining and milling on surface and ground waters of the Grants Mineral Belt.
2. Determine if discharges comply with all applicable regulations, standards, permits and licenses.
3. Evaluate the adequacy of company water quality monitoring networks, self-monitoring data, analytical procedures and reporting requirements.
4. Determine the composition of potable waters at uranium mines and mills.
5. Develop priorities for subsequent monitoring and other follow-up studies.

During the survey, samples were collected from wells, industrial discharges, drinking water supplies, and surface streams. The samples were appropriately preserved to determine the radiochemical, nutrient, and metals content and shipped to the NEIC and ORP-LVF laboratories for analyses (Appendix A). NEIC custody procedures were maintained during the collection and analyses of the samples (Appendix B).

This report presents the findings of analyses of surface water streams, potable water supplies, and industrial discharges. Appendix C contains raw data for all samples collected during the survey and analyzed by NEIC. The NEIC analysis, when combined with the ORP-LVF report, will present an overall study of water quality in the Grants Mineral Belt.

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II. SUMMARY AND CONCLUSIONS

Task: Assess the impacts of waste discharges from uranium mining and milling on surface and ground waters of the Grants Mineral Belt.

1. Radium concentrations in Arroyo del Puerto, a perennial stream, exceed New Mexico Water Quality Criteria as a result of discharges from the Kerr-McGee ion-exchange plant and Sections 30W and 35 mines and from the United Nuclear-Homestake Partners ion-exchange plant. Selenium and vanadium concentrations exceed EPA 1972 Water Quality Criteria for use of the water for irrigation and livestock watering, and render the stream unfit for use as a domestic water source.

2. Rainfall and runoff at the Anaconda Jackpile Mine erode uranium- and selenium-rich minerals into Rio Paguate. This erosion can be mitigated by waste stabilization and runoff control.

Task: Determine if discharges comply with all applicable regulations, standards, permits, and licenses.

1. At the time of sampling, the effluent from the Kerr-McGee ion-exchange plant contained dissolved-radium 226 at concentrations in excess of the applicable NPDES permit and New Mexico uranium-milling license conditions. This radium discharge was partly responsible for violations of New Mexico Water Quality Standards for Arroyo del Puerto, a perennial stream. The discharge also contained uranium at concentrations in excess of NPDES permit criteria. No treatment other than settling is currently in operation.

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2. The Kerr-McGee Section 30W mine discharge contained dissolved radium-226 at concentrations in excess of the applicable NPDES permit condition. No treatment other than settling is currently in operation. This radium discharge also was partly responsible for violation of New Mexico Water Quality Standards in Arroyo del Puerto.

3. Kerr-McGee Nuclear Corporation has not applied for a discharge permit for their Section 35 mine, although the effluent reaches Arroyo del Puerto, a perennial stream. The discharge contains an average of 51 pCi/l of dissolved radium-226. No radium-removal treatment is currently in operation.

4. Sampling at the United Nuclear Corportion Churchrock mine was conducted when the operation was inactive due to a power failure and subsequent mine flooding. Indications are that the present treatment facility is inadequate to meet existing NPDES permit conditions.

5. Approximatley 15 percent of the total flow through the United Nuclear-Homestake Partners ion-exchange plant is discharged to Arroyo del Puerto, with the balance of the flow returning to the mines for in situ leaching. The discharge to Arroyo del Puerto is not regulated by an NPDES permit, and it contributes to the violation of New Mexico Water Quality Standards for radium-226 in this perennial stream. Uranium is lost from the ion-exchange facility. The facility is currently violating conditions of the applicable State license.

Task: Determine the composition of potable waters at uranium mines and mills.

1. Four industry potable water supply systems, obtained from mine waters, exceeded 1962 U. S. Public Health Service Drinking

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Water Standards for selenium. Three such potable systems exceeded both the existing USPHS and proposed EPA Interim Primary Drinking Water Standards for radium. Such mine water is supplied as potable to families of miners at the United Nuclear Corporation Churchrock mine. These conditions are considered intolerable as they bear on the long-term health of those using the supplies. Non-potable systems at the Kerr-McGee mill and Churchrock mine have high radium and selenium concentrations, and are not adequately marked as non-potable.

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III. RECOMMENDATIONS

ACTION REQUIRED

1. Procedures be initiated to require United Nuclear Corporation to immediately provide potable water which meets Federal Drinking Water Standards for their Ambrosia Lake and Churchrock operations.

2. Procedures be initiated to require Kerr-McGee Nuclear Corporation to immediately provide potable water supplies which meet Federal Drinking Water Standards at their mill and Sections 35 and 36 mines; the mill and Churchrock mine non-potable water supplies be clearly marked.

3. NMEIA initiate appropriate action to insure safe industrial potable water supplies at the United Nuclear Corporation's Ambrosia Lake and Churchrock operations and at the Kerr-McGee Nuclear Corporation's mill and Section 35 and 36 mines.

4. NMEIA should conduct periodic sampling of potable water supplies at operating uranium mines and mills throughout the State.

5. Improved mining practices should be adopted to reduce the amount of radium leached from ore solids by ground water present in operating mines.

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6. Procedures should be initiated to require Anaconda Company to improve its present efforts at stabilizing waste and ore piles at the Jackpile Mine in order to prevent water erosion from transporting uranium and selenium into Rio Paguate.

7. Procedures be initiated to require Kerr-McGee Nuclear Corporation to immediately install necessary treatment systems to reduce the dissolved radium-226 concentration in the Section 30W mine discharge to applicable NPDES permit conditions.

8. Procedures be initiated to require Kerr-McGee Nuclear Corporation to file an application for discharge from their Section 35 mine. The permit should provide limits on total suspended solids, radium-226 and uranium, consistent with the permit conditions for the Section 30W mine.

9. Procedures be initiated to require Kerr-McGee Nuclear Corporation to immediately install necessary treatment systems to ensure that effluent from their ion-exchange plant meet applicable NPDES permit and State uranium milling license conditions. The Company should develop operating schedules to guard against undetected uranium breakthrough and subsequent discharge of uranium to Arroyo del Puerto.

10. United Nuclear-Homestake Partners should install pumps and pipelines necessary to achieve complete recycle of ion-exchange discharge. If unable to achieve complete recycle, it will be necessary to issue an NPDES permit. The Company should immediately install necessary treatment facilities to comply with the applicable State uranium milling license.

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ADDITIONAL STUDIES REQUIRED

Resampling should be scheduled at the United Nuclear Corporation Churchrock mine during periods of normal operation.

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IV. DESCRIPTION OF STUDY AREA

LOCATION

The Grants Mineral Belt extends west from a point slightly northwest of Albuquerque, New Mexico, north of the towns of Grants and Gallup, almost to the New Mexico-Arizona state line [Fig. 1]. The Belt extends about 48 km (30 mi) north from the routes of U.S. 66 and the Atchison, Topeka and Santa Fe railroad. Some mining is conducted in Valencia County, but the bulk of the Grants Mineral Belt is in southern McKinley County.

The principal centers of population in the area are the towns of Grants and Gallup, and the villages of Churchrock, Wingate, Milan, and Laguna. Population in the area has increased rapidly since 1950, with the development of extensive uranium mining and milling operations.

With the exception of the volcanically formed Mt. Taylor area, most of the area is plateau topography underlain by sedimentary rocks. Streams have incised steep-walled valleys in the area, with broad valleys in those areas underlain by easily erodable sediments.

The eastern half of the Grants Mineral Belt, including the Ambrosia Lake district, is tributary to Rio San Jose. The western portion is in the valley of the Rio Puerco, a tributary to the Little Colorado River.

CLIMATE

The Grants Mineral Belt area is semi-arid to arid, with an average annual temperature of about 10°C (50°F). Maximum summer temperatures

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rarely exceed 38°C (100°F) with minimum temperatures occasionally below -18°C (0°F). The humidity in the area is usually low, and moderate to strong winds are common during the spring. Precipitation is largely influenced by elevation, with a positive correlation between increasing elevation and increasing precipitation. Annual average precipitation at the Grants Airport is 21 cm (8.3 in), approximately 70% of which occurs May through September.

INDUSTRY

Industry in the Grants Mineral Belt used to be largely centered around farming and ranching, with limited tourism. Since 1950, the economic base of the Grants Mineral Belt area has completely shifted to industry, based on the mining and milling of uranium ore to produce yellow cake.

Underground mining operations in the Grants Mineral Belt are by the room and pillar method, which consists of driving a number of parallel development drifts in the ore horizon. A series of parallel sluicer drifts are driven at right angles, leaving a grid of ore pillars to support the overlying rock, or "roof." As the pillars are mined (robbed), the roof is rock-bolted and supported by timbers as necessary to prevent subsidence. The mined area (stope) is then abandoned.

The ore horizon in underground mines in the Grants Mineral Belt is composed of the Westwater Canyon member of the Jurassic Morrison formation, which is the main aquifer of the Grants Mineral Belt area. Therefore, large quantities of ground water must be pumped from each mine to prevent mine flooding. Ore bodies are dewatered by drilling "long holes" from the development drifts into the ore horizon, and permitting ground water to flow from the long holes into the drifts and then be pumped to the surface for discharge. Water flow is by gravity to sumps

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near the mine shaft, with positive pumpage to the surface. This water passes through settling basins at each mine to remove solids and then is either pumped to an ion-exchange plant for removal of contained uranium, or is discharged directly to surface water courses. Some of the ion-exchange water is recycled to the mines for use in solution mining or is used as a potable water supply for workers in the mines and mills.

Where the physical and economic situations permit, most mining companies now collect underground mine water in a single location for ion-exchange treatment to recover uranium which is dissolved in the mine water. Recovery is accomplished by using specific resins which are extremely selective in the removal of dissolved uranium. The mine water is passed through the resin column where the resin becomes *loaded* until it reaches its capacity for uranium (*breakthrough*). Flow is then diverted to another barren resin column and the loaded resin is *stripped* or eluted with a sodium chloride brine. The pregnant sodium chloride brine is then treated in one of the uranium mills to precipitate yellow cake. The barren solution is returned and reused for subsequent elution steps.

Experience has shown that a carefully operated ion-exchange plant will yield an effluent containing less than 1 mg/l uranium in solution (USEPA, April 1975). The greatest operating difficulty has been in monitoring for breakthrough of the uranium, or the loading of ion-exchange resins. Both United Nuclear Corporation and United Nuclear-Homestake Partners return a portion of the ion-exchange effluent, or *tailings*, to abandoned mines in the Ambrosia Lake area. This barren water is used to leach the ore which remained behind in ore pillars and rock which was not of ore grade. By this practice, uranium resources are recovered which would otherwise be lost.

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The Anaconda Company operates its Jackpile-Paguate mine mostly as an open-pit operation. From 1953 to the present, the operation has yielded approximately 10 million tons of uranium ore with an average grade of 0.25% uranium oxide (Graves, Aug. 1974). Mining is accomplished with power shovels loading off-highway trucks. Ore is transported from the mine to Anaconda's mill by rail.

No surface discharge of water is reported from the Jackpile mine. Rainfall collects in pits and seeps or evaporates. However, intense summer thunderstorms erode piles of waste and ore.

Three uranium mills are currently operating in the Grants Mineral Belt, and several other mills are in the design or construction phase. The three operating mills practice different techniques for uranium recovery. All three operate on the basis of zero discharge of waste to surface waters by utilizing evaporation, seepage and, in one case, subsurface injection. To solubilize the uranium, two of the mills acid leach the ore while the third uses an alkaline leach circuit. Uranium is concentrated by solvent extraction at two of the mills. In all three mills, uranium is precipitated as yellow cake, a complex uranium oxide. Ammonia is used in precipitating or purifying the yellow cake at all three mills. Details on milling techniques at the three facilities are provided in the August 1974 issue of *Mining Engineering* (Vol. 26, no. 8).

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V. REGULATIONS

The discharge of wastes to surface or ground waters from uranium mining and milling operations are subject to a number of regulations. Applicable portions of each regulation are discussed below.

NEW MEXICO WATER QUALITY STANDARDS

Water Quality Standards were adopted by the New Mexico Water Quality Control Commission under the authority of Paragraph C, Section 75-39-4 of the New Mexico Water Quality Act (Chapter 326, Laws of 1973, as amended). The NMEIA has held that general standards do apply to receiving waters in the Grants Mineral Belt. The general standard that governs these radioactive discharges follows:

> Radioactivity - The radioactivity of surface waters shall be maintained at the lowest practical level and shall in no case exceed the standards set forth in Part 4 of New Mexico Environmental Inprovement Board Radiation Protection Regulations, adopted June 16, 1973.

These regulations set a maximum concentration of 30 pCi/l of dissolved radium-226.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS

Congress, with the passage of the *Federal Water Pollution Control Act Amendments of 1972* (PL92-500, Oct. 18, 1972) established the requirement for NPDES permits for discharge of pollutants to waters of the United States. Discharge of pollutants without a valid NPDES permit is illegal.

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To date, three permits have been written covering four sources in the area studied.

Permit No.	Outfall No.	Source
NM0020532	001	Kerr-McGee Nuclear Corp. Sec. 30W Mine
NM0020532	002	Kerr-McGee Nuclear Corp. Ion Exchange Facility
NM0020524	001	Kerr-McGee Nuclear Corp. Churchrock Mine
NM0020401	001	United Nuclear Corp. Churchrock Mine

The first three sources are currently pending adjudication with respect to the need for an NPDES permit to discharge to Puertecito Creek or Rio Puerco.

Specific numerical limits are set for the concentration of total suspended solids (TSS), total uranium, and dissolved radium-226 [Table 1]. In addition, each permit contains the following statement: ,

> Provision shall be made to assure the elimination of all seepage, overflow or other sources which may result in any direct or indirect discharge to surface waters other than that authorized by this permit.

URANIUM-MILLING LICENSES

U.S. Regulation 10CFR20 provides that all persons "who receive, possess, use or transfer ... source material" shall be controlled by general or specific license issued by the U.S. Atomic Energy Commission (now called the Nuclear Regulatory Commission) or any state conducting a licensing program. Source materials are defined as ores which contain more than 0.05% of combined uranium and thorium. Under the regulation, all ion-exchange plants and uranium mills are licensed by the New Mexico Environmental Improvement Agency.

The regulations set forth the maximum concentration of various radionuclides which are permitted in effluents to "unrestricted areas." An unrestricted area is defined as any area to which access is not

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Table 1

SUMMARY OF NPDES PERMIT CRITERIA

Company/Discharge	Period of Limitation	Parameter†						pH Range
		TSS (mg/l)		Total Uranium (mg/l)		Dissolved Radium-226 (pCi/l)		
		Daily		Daily		Daily		
		Avg.	Max.	Avg.	Max.	Avg.	Max.	
Kerr-McGee Corporation								
Churchrock Mine	1/28/75-6/30/77	20	30	-	2	-	30	6.0-9.5
	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0
Section 30W Mine (Ambrosia Lake)	1/28/75-12/31/75	20	30	-	2	-	150	6.0-9.0
	1/1/76-6/30/77	20	30	-	2	-	30	6.0-9.0
	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0
Ion-Exchange Plant (Ambrosia Lake)	1/28/75-12/31/75	20	30	-	1	-	100	6.0-9.0
	1/1/76-6/30/77	20	30	-	1	-	30	6.0-9.0
	7/1/77-1/27/80	20	30	-	1	-	3.3	6.0-9.0
United Nuclear Corporation								
Churchrock Mine	1/28/75-12/31/75	100	200	-	2	-	30	6.0-9.5
	1/1/76-6/30/77	20	30	-	2	-	30	6.0-9.5
	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0

† *In addition to these parameters, the companies are required to monitor flow, temperature, total molybdenum, total selenium and total vanadium.*

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controlled by the licensee to protect individuals from exposure to radiation and radioactive materials. Personnel badge monitoring is not required in unrestricted areas. The maximum allowable concentration of radium-226 in a water effluent to an unrestricted area is 30 pCi/l. All uranium mills and ion-exchange plants are controlled by this regulation from the initial start-up of the facility.

POTABLE WATER REQUIREMENTS

Congress, with the passage of the *Safe Drinking Water Act* (PL93-523, Dec. 16, 1974) extended Federal control over many potable water supply systems. Previously, only those systems used in interstate commerce were required to meet USPHS Drinking Water Standards. The latest issue of the USPHS Standards set a limit of 3 pCi/l for radium-226, and 0.01 mg/l for selenium.

The Safe Drinking Water Act applies to all public systems supplying water to fifteen service connections or at least 25 individuals unless the system is exempted by four specific criteria. The industrial potable water supply systems in the Grants Mineral Belt are thus covered by the Safe Drinking Water Act.

As required by Sections 1412, 1414, 1415, and 1450 of the Safe Drinking Water Act, the EPA Administrator, on March 14, 1975, proposed *Interim Primary Drinking Water Standards*. These proposed regulations include a limit of 0.01 mg/l selenium. The Interim Primary Drinking Water Standards are to be promulgated within 180 days of the enactment of the Act, and they become effective 18 months after their promulgation, or Dec. 1977. The EPA has proposed standards of 5 pCi/l radium (226 and 228) and 15 pCi/l gross alpha (exclusive of uranium) under the Act (Appendix D quotes the *EPA Water Quality Criteria, 1972* on selenium).

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The New Mexico Environmental Improvement Agency (Sections 4 and 12, Chapter 277, New Mexico Laws of 1971) is vested with authority to maintain, administer, and enforce the "Regulations Governing Water Supplies and Sewage Disposal" adopted in 1937 by the former New Mexico State Board of Public Health.

Section 1 of the aforementioned 1937 Water Supply Regulations states:

> No person, firm, corporation, public utility, city, town, village or other public body or institution shall furnish or supply or continue to furnish or supply water used or intended to be used for human consumption or for domestic uses or purposes, which is impure, unwholesome, unpotable, polluted or dangerous to health, to any person in any county, city, village, district, community, hotel, temporary or permanent resort, institution or industrial camp.

It is from this and other sections of the 1937 regulations that the NMEIA has authority to regulate public water supply systems. However, individual residential sources used for private consumption are not covered by the 1937 regulations. Therefore, the NMEIA can only advise as to the quality of the water in the case of such residential sources.

NUISANCE SUITS

New Mexico is given specific authority to take enforcement action against a polluter under the Nuisance statute (40A-8-1 through 40A-8-10, 1953 Compilation). A section titled Polluting Water (40A-8-2) allows the New Mexico Environmental Improvement Agency to seek remedial action against any wastewater discharger that pollutes any water of the state whether it is public or private, surface or subsurface water. In 1973 the NMEIA successfully prosecuted the City of Hobbs for polluting ground water by land disposal of the city's sewage effluent. The court order required the City to remove the polluted water and supply potable water to affected parties.

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VI. WASTE SOURCE EVALUATION

Five companies are currently engaged in mining and/or milling operations in the Grants Mineral Belt, and several other companies are presently in design or construction phases. The results of waste-source evaluations at each of the operating companies are presented below.

KERR-MCGEE NUCLEAR CORPORATION

Kerr-McGee operates mines in both the Ambrosia Lake and Churchrock Mining Districts of the Grants Mineral Belt. Water from five of the Ambrosia Lake mines (Sections 17, 22, 24, 30 and 33)* is pumped to an ion-exchange plant at the Kerr-McGee mill [Fig. 2]. The majority of ion-exchange discharge (also referred to in the mining industry as tailings) is used in the mill as process water and non-potable water. A small remainder receives additional ion-exchange treatment for potable water use within the mill. Excess ion-exchange tailings are discharged into Arroyo del Puerto. The NPDES permit** and State uranium milling license for this discharge requires that the radium 226 concentration not exceed 100 pCi/l and 30 pCi/l, respectively. The data [Table 2] shows that this discharge contained an average of 151 pCi/l radium-226 during the survey. This exceeds both the NPDES permit immediate limitations and the State license. This latter license has been in effect since the time of the construction of the ion-exchange plant. The

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* *The names of mines are based on the section in which they are located; all of these are in T14N, R9W, McKinley County, New Mexico.*

** *Kerr-McGee has requested an adjudicatory hearing on its permits for the ion-exchange plant and Section 30W mine. The company contends that an NPDES permit is not required to discharge to Arroyo del Puerto. The Kerr-McGee State license is effective for the Kerr-McGee ion-exchange plant.*

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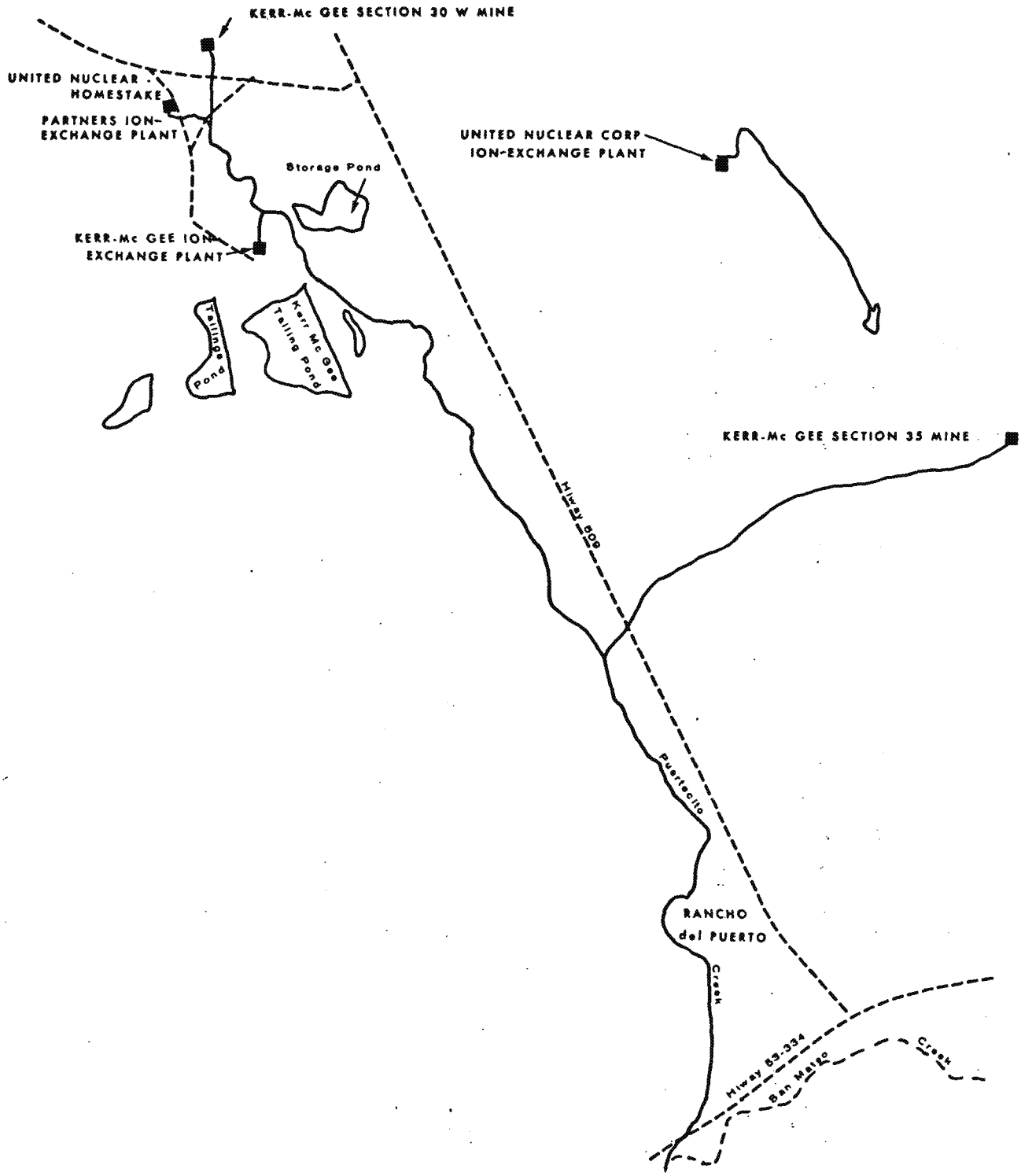

Figure 2. Ambrosia Lake Mining District Surface Water Discharges

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Table 3

SUMMARY OF ANALYTICAL DATA FOR INDUSTRIAL DISCHARGES
GRANTS MINERAL BELT SURVEY
February 26-March 6, 1975

Station Description	Average Flow (mgd)	Number Composite Samples	Gross Alpha (pCi/l)			Radium 226 (pCi/l)			Uranium (mg/l)			Total Suspended Solids (mg/l)			Selenium (mg/l)			Vanadium (mg/l)		
			Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.
Kerr-McGee I-X Tailings Bypass	0.64	3	600	430	510	157	148	151	4.2	1.3	2.5	31	16	25	0.07	0.03	0.05	1.0	0.7	0.9
Kerr-McGee Sec 30W Mine Dischg	1.36	3	1,400	1,300	1,400	174	154	163	6.7	5.9	6.2	26	17	22	0.04	0.03	0.03	0.8	0.7	0.7
Kerr-McGee Sec 19 Mine Discharge	0.15	1	--	--	72	-	-	9.3	-	-	0.23	-	-	16	-	-	<0.01	-	-	0.6
Kerr-McGee Sec 35 Mine Discharge	3.77	3	3,000	2,400	2,700	68	32	51	26	14	19	120	86	100	0.08	0.04	0.07	1.0	0.6	0.8
Kerr-McGee Sec 36 Mine West Discharge	2.07	3	850	570	680	178	101	131	3.4	2.6	3.0	44	33	38	0.01	<0.01	<0.01	1.0	0.8	0.9
Kerr-McGee Sec 36 Mine East Discharge	0.14	3	580	510	560	72	59	65	2.5	2.3	2.4	32	27	29	0.03	<0.01	0.01	0.8	0.4	0.6
Kerr-McGee Seepage below Tailings Pond	-	1	-	-	144,000	-	-	65	-	-	160	-	-	38	-	-	0.70	-	-	5.6
Ranchers Exploration-Johnny M Mine Discharge	0.46	1	-	-	20	-	-	1.6	-	-	0.12	-	-	7	-	-	<0.01	-	-	<0.3
United Nuclear Corp. Ion-Exchange Discharge	0.08	3	2,300	1,400	1,800	39	14.3	31	11	5.9	7.8	7	3	5	0.12	0.02	0.08	0.5	<0.3	0.3
United Nuclear-Homestake Partners Ion Exchange Discharge	0.60	3	970	760	830	111	101	108	5.8	2.3	3.7	16	7	10	0.33	0.30	0.32	0.5	<0.3	0.3
United Nuclear-Homestake Partners Tailings Pile Decant	1	-	-	29,000	-	-	52	-	-	150	-	-	5	-	-	0.92	-	-	6.8
Anaconda Co. Injection Well Feed	0.16	1	-	-	62,500	-	-	53	-	-	130	-	-	3	-	-	0.03	-	-	6.3
United Nuclear Corp. Churchrock Mine Discharge	2.06	3	870	730	810	27.3	19.8	23.3	7.6	6.5	7.2	71	33	50	0.06	<0.01	0.04	0.5	0.4	0.4
Kerr-McGee Churchrock Mine Discharge	2.18	3	240	210	230	8.7	6.8	7.9	0.97	0.72	0.81	58	38	47	0.01	0.01	0.01	0.9	0.7	0.8

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concentration of radium in the ion-exchange discharge could be reduced to meet permit conditions with the relatively simple addition of barium chloride. The New Mexico Water Quality Standards for Arroyo del Puerto, a perennial stream, limits radium concentrations to a maximum of 30 pCi/l. The Kerr-McGee ion-exchange discharge to Arroyo del Puerto contributes to violations of these standards (see Section VII. *STREAM SURVEYS*).

The NPDES permit for the Kerr-McGee ion-exchange discharge limits uranium to a daily maximum concentration of 1 mg/l. During the three days of composite sampling, the uranium concentration in the discharge ranged from 1.3 to 4.2 mg/l for an average of 2.5 mg/l, or 2.5 times the permitted maximum concentration. This violation of the permitted level probably resulted from overloading of the resin and failure to switch resin columns. The Company should adopt a regeneration cycle that will prevent resin saturation by uranium (breakthrough) which results in permit violation.

Selenium is an extremely toxic substance which behaves very similarly to arsenic. It is present in the ore of the Grants Mineral Belt, and thus it could reasonably be expected to be present in water from processing plants. The Kerr-McGee ion-exchange tailings contained from 0.03 to 0.07 mg/l, an average of 0.05 mg/l. These tailings also contained almost 1 mg/l vanadium, which has been shown to be toxic to plants when present in irrigation water. The high selenium and vanadium concentration precludes the use of Arroyo del Puerto for irrigation (discussed in Section VII).

Mine water from other Kerr-McGee Ambrosia Lake mines (Sections 19, 30W, 35, and 36) does not receive ion-exchange treatment. Section 19 Mine, currently under development, discharges approximately 378 l/min (100 gpm) of wastewater which contains 9.3 pCi/l of radium on the land surface. Since this discharge does not reach a surface water course, the Company has not applied for an NPDES permit.

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The NPDES permit for the Kerr-McGee Section 30W mine imposes immediate limits on the radium-226 content of this discharge. The initial maximum limit is 150 pCi/l, with a final limit of 3.3 pCi/l [Table 1]. During the survey, this discharge contained an average concentration of 163 pCi/l of radium-226 [Table 2] which exceeds permit conditions. The discharge enters Arroyo del Puerto upstream of the Kerr-McGee ion-exchange discharge and contributes to the water quality standards violation in Arroyo del Puerto (see Section VII). The 30W discharge also contained selenium and vanadium [Table 2] and contributes to the high concentration of these elements in Arroyo del Puerto.

The uranium concentration of Section 30W mine discharge is limited to 2 mg/l daily maximum by the NPDES permit. During the survey, the uranium concentration of this discharge ranged from 5.9 to 6.7 mg/l, for an average of 6.2 mg/l, a violation of the NPDES permit conditions. The company reportedly plans to pipe this discharge to their ion-exchange plant.

During the Grants Mineral Belt survey, 14,300 m^3/day (3.77 mgd) of water was discharged from Kerr-McGee Section 35 mine settling ponds into a marshy area south of the mine. Company officials claim this discharge does not reach any surface water and therefore an NPDES discharge permit is not required. Visual observations by NEIC personnel showed that this discharge, estimated at several hundred gallons per minute, does enter Arroyo del Puerto. The flow rate was highly variable, depending on climatic conditions. The radium concentration in this wastewater ranged from 32 to 69 (average 51) pCi/l which exceeds limitations currently specified in permits for similar discharges. The radium concentrations can be reduced to less than 30 pCi/l with the addition of a barium chloride treatment system. Gross alpha concentrations were high, ranging from 2,400 to 3,000 pCi/l. ORP-LVF conducted analyses for the alpha emitters other than radium contained in this discharge. The analyses indicated that lead-210 may be significant in this and other discharges; however, the data are not available at this time. Uranium,

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selenium, and vanadium are also present in this discharge [Table 2] and contribute to high values in Arroyo del Puerto. Suspended solids in the Section 35 mine discharge were high, ranging from 86 to 120 mg/l with an average of 100 mg/l. Analysis of incoming mine water from long holes within the area indicates that the radium concentrations in natural ground water are less than 10 pCi/l. However, water moves over the entire floor of the drift, and it is subject to agitation by passage of haulage trains and during mucking. Accordingly, the suspended solids concentration in the mine water is high, producing a high dissolved radium concentration. The suspended solids and radium concentrations in the effluent could be greatly lowered by improved housekeeping in the mining operations, such as providing drainage channels along the sides of the mine workings.

Section 36 mine has two discharges, identified as the east and west discharges in relation to the mine shaft. Samples from each discharge were collected and analyzed. Except for a minor amount of water used by drilling rigs in the area, the entire mine pumpage receives treatment in sedimentation basins before discharge into a large closed basin over the San Mateo fault. During the survey, all the water was sinking into the subsurface and moving as ground water. Survey results [Table 2] show the west discharge contained an average of 131 pCi/l radium-226 compared to 65 pCi/l in the east discharge. These concentrations exceed license criteria (10 CFR20) for discharge to an unrestricted environment. The discharge also contained from 0.4 to 1.0 mg/l vanadium, which precludes use of this water for crop irrigation on acid soils, or long-term use on any soil (Committee on Water Quality Criteria, 1972).

Company officials stated that the Section 35 and 36 mine discharges will be diverted to a new set of treatment ponds for biological removal of radium 226, utilizing algal growth and radium incorporation. If

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necessary, radium-226 concentrations can be further reduced by barium chloride treatment. These new ponds, to be constructed sometime during 1975, will discharge into the closed basin currently receiving the Section 36 mine discharge. The increased flow into this closed basin may result in a surface discharge to San Mateo Creek. In this case, an NPDES permit will be required which should specify an immediate radium-226 limit of 30 pCi/l.

Kerr-McGee Nuclear Corporation is developing a new mine in the Churchrock mining district. The mine water receives treatment in two sedimentation ponds. Some of the effluent from the pond is used in the mine change-house for non-potable uses such as showers and commodes, and the remainder is discharged into Rio Puerco. The immediate NPDES permit limitations for this discharge include 100 mg/l daily average and 200 mg/l daily maximum total suspended solids concentration, 2 mg/l daily maximum uranium concentration and 30 pCi/l dissolved radium-226. The lack of ongoing mining activities in the mine is reflected in the relatively low radiochemical concentration in the water from this mine [Table 2], with an average radium-226 concentration of 7.9 pCi/l.

The Kerr-McGee Nuclear Corporation mill near Ambrosia Lake removes uranium from the ore by an acid leach technique, followed by solvent extraction to concentrate the uranium, and by ammonia precipitation of yellow cake. A molybdenum byproduct recovery is also practiced at the Kerr-McGee mill. Approximately 75% of the mill water is recycled, while the other 25% is lost through seepage and evaporation. Because of dissolved solids buildup, it is thought to be impossible to practice 100% recycle without dissolved solids removal techniques. Process water for the Kerr-McGee mill is obtained from the Kerr-McGee ion-exchange treatment plant. Tailings are discharged to a single large tailings pond on the company property. Seepage from the pond is collected in a catchment basin and is then pumped to a pond upgradient from the tailings pond. Overflow from this pond is pumped upstream to another pond.

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In this way, all seepage from the evaporating ponds should be captured by the catchment basin. However, physical inspection of the area indicated that a quantity of seepage is lost to the subsurface, with a portion of the seepage possibly appearing in the flow in Arroyo del Puerto. This will require control under proposed NMEIA ground-water regulations, or regulations to be proposed under the U.S. Safe Drinking Water Act.

An 8-hr composite was collected from the catchment basin and analyzed to determine the quality of waste which might enter the ground water. The sample contained 144,000 pCi/l and 65 pCi/l, respectively, of gross alpha and radium-226. The radium concentration exceeds the AEC license criteria (30 pCi/l) for discharge to a nonrestricted environment. The gross imbalance which exists between gross alpha and radium indicates high concentrations of other alpha emitters. Identification and quantification of these emitters, and the effect on ground water, is discussed in the report by ORP-LVF. This water is extremely high in sulfate (15,000 mg/l) due to the use of sulphuric acid for leaching the Kerr-McGee ore. Suspended solids concentration in the seepage was approximately 38 mg/l. Selenium was present in 0.70 mg/l concentration, or 70 times the drinking water standard. Vanadium was present in the seepage at a concentration of 5.6 mg/l.

RANCHERS EXPLORATION AND DEVELOPMENT CORPORATION

Ranchers Exploration is currently developing the Johnny M. mine. Mine water is treated in two settling ponds before being discharged into San Mateo Creek. An NPDES permit application was filed by Ranchers Exploration, however the permit had not been issued at the time of the survey. The data [Table 2] show that the gross alpha and radium-226 concentrations were 20 and 1.6 pCi/l, respectively. This reflects the

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lack of ongoing mining activities in the operation. Uranium concentration in the water was 0.12 mg/l, while the suspended solids concentration was 7 mg/l.

UNITED NUCLEAR CORPORATION

United Nuclear Corporaton has three mines (two active and one on standby) in the Ambrosia Lake area. All mine water is pumped to an ion-exchange plant for uranium recovery. Over 99% of the ion-exchange effluent is used for solution mining. The remainder is either used as potable water or is discharged into a holding pond for use in sand backfill operations. There was no discharge from the pond at the time of the survey. Although an application has been filed, company officials stated that wastewater does not reach Arroyo del Puerto; therefore an NPDES permit is not required.

Samples were collected from the ion-exchange effluent at a point ahead of its return to the underground mines. The ion-exchange effluent contained an average of 31 pCi/l radium-226 and 1,800 pCi/l of gross alpha. Suspended solids concentration in the ion-exchange discharge were from 3 to 7 mg/l. As shown in Table 2, selenium concentration ranged from 0.02 to 0.12 mg/l, for an average of 0.08 mg/l.

United Nuclear Corporation also operates an underground mine in the Churchrock mining district. The NPDES permit limits the radium-226 concentration to a maximum of 30 pCi/l. Other NPDES permit criteria include 100 mg/l of suspended solids daily average, 200 mg/l suspended solids daily maximum, and 2 mg/l uranium daily maximum. A power failure at the mine during the last week in February resulted in flooding of work areas. During the survey, company personnel were pumping out the mine and repairing underground equipment. Composite samples collected during the clean-up operations contained an average radium-226 concentration of 23.3 pCi/l. After the survey, NMEIA personnel collected

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a grab sample on 14 March 1975 following the resumption of mining activities. This sample contained 57 pCi/l of radium-226 which exceeds the permit limitation. The composite samples contained from 33 to 71 mg/l suspended solids concentration, while the later grab sample contained 320 mg/l suspended solids. Uranium was present in the discharge at an average concentration of 7.2 mg/l. Additional sampling is suggested to check for NPDES compliance, once the mine returns to typical operation.

UNITED NUCLEAR-HOMESTAKE PARTNERS

The United Nuclear-Homestake Partners joint venture operates four underground mines (Sections 15, 23, 25 and 32) in the Ambrosia Lake mining district. Uranium in the mine water is removed in an ion-exchange plant. About 85% of the effluent is recycled through the mines and used for in situ leaching (solution mining). The remaining 15% (0.08 mgd) of the ion-exchange effluent is discharged into Arroyo del Puerto upstream of the Kerr-McGee mill. An NPDES application has recently been filed for this discharge. During this survey, the radium-226 concentration in this discharge exceeded 100 pCi/l. The radium-226 concentration in this discharge can be reduced to 30 pCi/l or less with the addition of a barium chloride treatment system. These high concentrations exceed the NPDES permit issued for similar discharges and the State uranium milling license currently in effect for this facility. This discharge contributes to the violation of the New Mexico Water Quality Standards for Arroyo del Puerto (see Section VII).

Suspended solids concentration in the United Nuclear-Homestake Partners ion-exchange discharge are low, ranging from 7 to 10 mg/l. Selenium concentrations range from 0.30 to 0.33 mg/l, more than 30 times the drinking water standard for selenium. These concentrations would pose a health hazard if the water were used for a potable supply.

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The presence of a large supply of clear water suggests an attractive alternative to plant personnel bringing their own drinking water to the plant. Uranium concentrations averaged 3.7 mg/l, indicating a need for closer monitoring of resin loading, or more frequent resin regeneration.

The United Nuclear-Homestake Partners Uranium mill recovers uranium by alkaline leaching of the ore, followed by ammonia precipitation of yellow cake. No ion-exchange or solvent extraction is practiced. Tailings-pile decant water is recycled through the mill. Seepage from the pile also enters ground water as determined by visual observation and ORP-LVF sampling. A sample of the decant, which is indicative of the quality of the seepage, contained 29,000 pCi/l and 52 pCi/l, respectively, of gross alpha and radium-226. The radium concentrations exceed the 10CFR20 criteria for discharge to a nonrestricted environment. The seepage also was found to contain 0.92 mg/l of selenium, or 92 times the drinking water standard. This is indicative of the geochemistry of selenium, which is found to be highly mobile in alkaline solutions. Results of the seepage on ground water are discussed in the ORP-LVF report.

Additional samples have been collected from a number of wells in the area downgradient from the United Nuclear-Homestake Partners tailings pond and are currently undergoing analyses. Problems of interlaboratory agreement are being resolved by appropriate Analytical Quality Control (AQC) programs. AQC data for the NEIC determinations are included in Appendix A. Results to date indicate that alkaline leaching of uranium milling tailings or uranium ore produces water high in a mobile form of selenium, and it presents definite problems of groundwater pollution. Seepage control measures should be required at this facility. Additional laboratory analysis of existing samples, and additional sampling to define the extent of the problem are planned for the near future.

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ANACONDA COMPANY

The Anaconda Company operates the world's largest open pit uranium mine, the Jackpile Mine on the Laguna Indian Reservation. There is no discharge of mine water to Rio Paguate or Rio Maquino. Precipitation runoff from the disturbed land surface, however, adds radiochemical-bearing solids to these streams. Stream samples [Table 3] show a definite increase in radium-226 and selenium concentrations downstream from the mining operation. The data show the need for stabilization of waste material and improved handling of storm runoff.

The Anaconda Company uranium mill at Bluewater uses a Resin In Pulp (RIP) ion-exchange process on an acid leach operation (Anon, Aug. 1974). In this circuit, baskets of ion-exchange beads are agitated in a crushed slurry ore. The beads, when loaded, are eluted with a dilute solution of sulfuric acid and sodium chloride. Uranium is precipitated in two steps, with the addition of calcium hydroxide during the first step and magnesium hydroxide during the second step. This precipitate is then washed with ammonium sulfate to remove sodium and produce a saleable yellow cake.

Process wastes from the Anaconda mill are discharged into a 70-acre tailings pond constructed on a highly permeable basalt flow. The water which does not seep from this pond is decanted, filtered to remove suspended solids, and fed at a rate of 1,100 l/min (300 gpm) to an injection well. A sample of the well feed, which is indicative of the seepage to the ground water, contained 62,500 pCi/l and 53 pCi/l, respectively, of gross alpha and radium-226 [Table 2]. Vanadium was present in a concentration of 6.3 mg/l. The well feed contained 150 mg/l uranium, which corresponds to a uranium loss of 245 kg (540 lb)/day. At present values of yellow cake, this would have a market value of $8,100 to $10,800/day. This uranium could be recovered by the installation of an ion-exchange plant between the present filter and injection well.

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VII. STREAM SURVEYS

When the mines and mills were evaluated, selected stream stations were sampled to determine the effect of mine and mill discharges on water quality. The New Mexico Water Quality Standards limit the radium concentration in surface streams to a maximum of 30 pCi/l. Data on the samples collected from surface streams are provided in Table 3.

ARROYO DEL PUERTO

Arroyo del Puerto receives waste from the United Nuclear-Homestake Partners and Kerr-McGee ion-exchange plants and from Kerr-McGee Section 30W and 35 mines. There is no flow in the creek upstream of these discharges.

Radium-226 concentrations of samples collected downstream from the Kerr-McGee mill were from 45 to 50 pCi/l. These concentrations not only violate the New Mexico Water Quality Standards, but exceed the AEC criteria (30 pCi/l) for radium in water discharged to an unrestricted environment. Radium concentrations in Arroyo del Puerto decreased near the mouth to levels ranging from 6.1 to 7.2 pCi/l. This decrease is due to the adsorption of radium on sediment and/or vegetation. During periods of heavy run-off, the radium concentration can be expected to increase due to scouring of the stream bed.

The selenium concentration of Arroyo del Puerto downstream from the Kerr-McGee mill was 0.15 mg/l, decreasing to 0.04 mg/l near the mouth. Vanadium concentrations in Arroyo del Puerto near the Kerr-McGee mill averaged 0.8 mg/l, increasing to 1.1 mg/l near the mouth. Selenium and

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Table 3

SUMMARY OF ANALYTICAL DATA
FOR
SURFACE WATER SAMPLING

Station Description	Number of Samples	Gross Alpha (pCi/l)			Radium-226 (pCi/l)			Uranium (mg/l)			Selenium (mg/l)			Vanadium (mg/l)		
		Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.
Arroyo del Puerto downstream of Kerr-McGee Mill	3	1,700	1,400	1,500	50	45	47	12	5.0	7.7	0.16	0.13	0.15	1.0	0.6	0.8
Arroyo del Puerto near the mouth	3	1,500	750	1,100	7.2	6.1	6.5	6.6	4.7	5.8	0.07	0.01	0.04	1.9	0.5	1.1
San Mateo Creek at Highway 53 Bridge	1	-	-	1,000	-	-	1.09	-	-	4.7	-	-	0.02	-	-	<0.3
Rio Puerco downstream of Churchrock Mines	3	500	470	490	2.60	0.97	2.04	5.0	3.8	4.2	0.07	0.03	0.04	0.6	0.5	0.6
Rio Puerco upstream of Wingate Plant	3	510	720	440	1.63	0.36	0.81	4.8	3.7	4.2	0.01	0.01	0.01	0.9	0.3	0.6
Rio Puerco at Highway 666 Bridge	3	350	210	260	0.42	0.09	0.22	2.5	1.7	2.0	<0.01	<0.01	<0.01	0.6	0.3	0.5
Rio Paguate at Paguate	1	-	-	2.8	-	-	0.11	-	-	<0.02	-	-	<0.01	-	-	0.6
Rio Moquino upstream of Jackpile Mine	1	-	-	11.2	-	-	0.17	-	-	<0.02	-	-	<0.01	-	-	1.8
Rio Paguate at Jackpile Ford	1	-	-	270	-	-	4.8	-	-	1.2	-	-	<0.05	-	-	0.5
Rio Paguate at Paguate Reservoir Discharge	1	-	-	230	-	-	1.94	-	-	1.1	-	-	<0.01	-	-	0.6
Rio San Jose at Interstate Bridge	1	-	-	38	-	-	0.37	-	-	0.10	-	-	<0.01	-	-	0.3

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vanadium have harmful effects when present in high concentrations in water used for irrigation or livestock watering. The 1972 EPA Water Quality Criteria (Committee on Water Quality Criteria, 1972) suggests that irrigation waters not exceed 0.02 mg/l selenium and 0.1 mg/l vanadium, while livestock waters should not exceed 0.05 mg/l selenium and 0.1 mg/l vanadium. On this basis, Arroyo del Puerto is rendered unfit for irrigation and livestock watering by the uranium mining discharges throughout its entire length. This is contrary to New Mexico Water Quality Standards which require that discharges not render a water unfit for a beneficial use.

The flow of Arroyo del Puerto enters San Mateo Creek where the entire flow enters the aquifer within three miles of the confluence. This recharge adds a large loading of radium and selenium to the ground water. Ground-water evaluations by ORP-LVF will address this question.

RIO PUERCO

The Rio Puerco receives drainage from Kerr-McGee and United Nuclear Corporation Churchrock mines. Samples collected downstream from these discharges contained a maximum radium-226 concentration of 2.6 pCi/l [Table 3]. The concentration decreased to 0.4 pCi/l at the town of Gallup. These concentrations meet the New Mexico Water Quality Criteria of 30 pCi/l, as well as the PHS Drinking Water Standard of 3 pCi/l for radium-226. Selenium concentrations downstream from the mine discharges ranged from 0.03 to 0.07 mg/l for an average of 0.04 mg/l, or four times PHS Drinking Water Standards. The selenium concentration decreased downstream to 0.01 mg/l at the Wingate plant and to less than detection limits at Gallup.

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RIO PAGUATE, RIO MOQUINO, RIO SAN JOSE

The Rio Paquate and Rio Moquino flow through the Anaconda open pit mines on the Laguna Indian Reservation. The combined flow enters Rio San Jose near Laguna, New Mexico. Samples collected from these three streams had radium concentrations of less than 5 pCi/l, which is less than the Water Quality Standard of 30 pCi/l set by the State of New Mexico. An increase in the selenium concentration of Rio Paguate was noted downstream from the Jackpile Mine. However, the concentration of selenium at Paguate reservoir and in Rio San Jose were less than detection limits.

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VIII. INDUSTRIAL WATER SUPPLIES

The majority of the mines and mills in the Grants Mineral Belt use mine water as a potable supply. The present PHS Drinking Water Standards specify that the radium concentrations not exceed 3 pCi/l, and the selenium not exceed 0.01 mg/l. The *Safe Drinking Water Act* (Public Law 92-523, Dec. 16, 1974) requires establishment of national drinking water standards. The proposed standards limit selenium to 0.01 mg/l. Also, EPA has proposed standards of 5 pCi/l for radium-226 and -228 and 15 pCi/l for gross alpha (40 CFR 141).

Data from potable water supplies in the Grants Mineral Belt are summarized in Table 4. All but one of the water-supply systems contain radium-226 in concentrations greater than the PHS Drinking Water Standard of 3.0 pCi/l. Severe violations of the 0.01 mg/l selenium standard are also present. Kerr-McGee Nuclear Corporation supplies water to mill workers and to several mobile homes within the area; the source is ion-exchange water from the mines, subsequently treated for radium removal. As shown in Table 4, the radium concentration in this water was at an acceptable level of 0.5 pCi/. The selenium in the water supply was 0.05 mg/l, or 5 times the drinking water standard. Treatment or an alternate source of supply will be required to meet the selenium standards.

Kerr-McGee operates a dual water supply system within the mill and the office facility -- a potable system described above, and a non-potable system used for washing and sanitary facilities. The latter uses ion-exchange tailings without further treatment. Radium concentrations in this water are extremely high, averaging over 150 pCi/l. Company personnel are largely uninformed about the existence of the dual water supply system and have admitted to drinking from the non-potable

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Table 4

SUMMARY OF DATA FOR
INDUSTRY POTABLE WATER SUPPLIES

Description	Gross Alpha (pCi/l)	Radium 226 (pCi/l)	Selenium (mg/l)
Kerr-McGee - Mill Water Supply	510	0.5	0.05
Kerr-McGee - Sec. 35 and 36 Mines	3,000	43	0.05
Kerr-McGee - Churchrock Mine†	120	6.5	0.01
United Nuclear Corporation - Ambrosia Lake Area	1,500	23.5	0.11
United Nuclear Corporation - Churchrock	620	12.6	0.06
United Nuclear Corporation - Mobile Home Supply at the Churchrock Mine	1,110	39.7	0.06

† *Reportedly used only for showers, stools, etc. and not for drinking water.*

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source. Warning signs should be posted on the non-potable water system to prevent subsequent potable use of this radioactive water.

Water from the Kerr-McGee Section 35 mine is treated by ion-exchange and used for a potable system for workers in Section 35 and 36 mines. This water contained a radium concentration of 43 pCi/l and a gross alpha concentration of 3,000 pCi/l. This exceeds existing and proposed standards for radiochemistry in the potable supply. The selenium in this supply was 0.02 mg/l, twice the level which constitutes grounds for rejection as a water supply under Drinking Water Standards.

Clarified water from the settling ponds at the Kerr-McGee Churchrock mine are pumped into the Kerr-McGee change house for use in sanitary facilities. The water contained concentrations of radium-226 approximately twice the Drinking Water Standards. It also contained selenium at a concentration of 0.01 mg/l, or the concentration which constitutes grounds for rejection as a potable water supply. The supply is not intended as potable, but it is not adequately marked as non-potable.

United Nuclear Corporation maintains a potable water supply system for its Churchrock mine as well as for mobile homes within the area. Water from the mine is pumped into a holding pond on Sunday, when mining activities are not under way. Water from this holding pond is then passed through a filter for removal of suspended solids. No further treatment is given. A sample collected from a water fountain within the United Nuclear Corporation change-house contained 12.6 pCi/l radium-226 and 0.06 mg/l selenium. These levels exceed PHS Drinking Water Standards and proposed standards under the Safe Drinking Water Act. The system is supplied to a number of private trailers in the area, and it clearly will come under the provision of the Safe Drinking Water Act.

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A sample was collected on March 5, 1975 from one of the mobile homes supplied by the United Nuclear Corporation Churchrock mine water-supply system. The sample contained 39.7 pCi/l radium-226 and 0.06 mg/l selenium. The trailer was occupied by the wife and three children of one of the uranium miners. These concentrations grossly exceed the proposed and present drinking water standards and pose a health hazard to the employees and their families. The United Nuclear Corporation should take immediate action to improve the quality of this domestic supply or locate an alternate source of water.

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3. Graves, John A., Aug. 1974, Open Pit Uranium Mining, *Mining Engineering*, SME-AIME 26, 8:23-25.

4. Guccione, Eugene, Aug. 1974. Fuel Shortages Trigger a New Uranium Rush in New Mexico, *Mining Engineering*, SME-AIME, 26, 8:16-19.

5. U. S. Environmental Protection Agency, Apr. 1975. Draft Development Document for Effluent Limitations, Guidelines, and Standards of Performance for the Ore Mining and Dressing Industry Point Source Category, USEPA Contract No. 68-01-2682.

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Appendix A

ANALYTICAL QUALITY CONTROL
FIELD AND LABORATORY PROCEDURES

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ANALYTICAL QUALITY CONTROL
FIELD AND LABORATORY PROCEDURES

WASTE SOURCE EVALUATIONS

Mining and milling operations operated by five companies were investigated during the Grants Mineral Belt survey. Information was obtained through in-plant surveys, review of NPDES permit applications, and interviews with industry personnel, on water pollution control practices at each site.

Sampling was conducted in accord with a previously prepared Study Plan (attached). Sampling proceeded as planned, except that conditions at United Nuclear Corporation's Churchrock mine were atypical due to power failure and subsequent mine flooding. Daily composite samples were collected manually into large cleaned containers on an equal volume basis. The composite sample was then returned to a central sample preparation site where individual samples were prepared in accord with Table 4 of the Study Plan. Company sample splits were prepared where requested. Filtering was done through a 0.45 μ filter, using stainless steel pressure filtering equipment.

Where available, industry flow-measurement equipment was used. In other cases, various standard flow measurement techniques such as "V" notch weirs and stage recorders were used.

The samples were maintained under custody procedures and transported to the NEIC laboratory in NEIC vehicles.

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STREAM SURVEYS

Limited stream surveys were conducted to determine the effects of mining and milling discharges on surface waters of the Grants Mineral Belt. Sampling was generally in accord with the Study Plan, except where there was no flow. Sampling in the Paguate area was restricted to one-time grab sampling. Sample preparation was in accord with the discussion in the previous section.

INDUSTRY WATER SUPPLIES

Grab samples were collected from industry potable and non-potable (sanitary) water supplies, in accord with the Study Plan. Sampling sites were at water fountains, faucets, or showers. The source was permitted to run for a time before sample collection. Samples were subsequently split and preserved, as discussed in the section on waste source evaluation.

ANALYTICAL PROCEDURES AND QUALITY CONTROL

Samples collected during this survey were, for the most part, analyzed according to procedures outlined in the EPA Manual, *Methods for Chemical Analysis of Water and Wastes, 1971.* Gross alpha and radium-226 levels were measured according to procedures described in *Standard Methods for Water and Wastewater Analysis, 13th Ed.* Uranium was measured by the fusion/fluorescence procedure described as Method #D2907-701 in the *ASTM Manual, Part 31, 1975.* Selenium was analyzed by a fluorometric procedure developed by Crenshaw and Lakin (Journal Research U.S. Geological Survey, 2 (4), 483 (1974)); the fusion step was omitted, however, since the samples were non-geological in origin. These analytical procedures are summarized below.

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Parameter	Method	Reference
Co, Cu, Fe V, Mo	Atomic Absorption[1]	EPA Methods for Chemical Analysis, 1971
Na	Atomic Emission[1]	EPA Methods for Chemical Analysis, 1971
As	Colorimetric	EPA Methods for Chemical Analysis, 1971
TSS, TDS	Gravimetric	EPA Methods for Chemical Analysis, 1971
SO_4	Turbidimetric	EPA Methods for Chemical Analysis, 1971
Cl	Titrimetric	EPA Methods for Chemical Analysis, 1971
NH_3	Automated Colorimetric	EPA Methods for Chemical Analysis, 1971
NO_2 + NO_3	Automated Cadmium Reduction	EPA Methods for Chemical Analysis, 1971
Gross	Internal Proportional Counting	Standard Methods, Section 302.4.a.
Radium-226	Radon emanation[2]	Standard Methods, Section 305
Uranium	Fusion/Fluorescence[1]	ASTM, D290F
Se	Fluorometric	Crenshaw and Lakin, J. Res. U.S. Geol. Survey, Vol. 2, No. 4, July-August, 1974, p. 483-487

[1] *Digestion of samples per Sec. 4.1.4. EPA Methods*

[2] *$RaSo_4/BaSO_4$ precipitate collected by centrifugation, dissolved in diethylenetriamine pentaacetic acid, and placed directly in bubbler.*

Reliability of the analytical results was documented through an active Analytical Quality Control (AQC) Program. As part of this program, replicate analyses were normally performed with every tenth sample to ascertain the reproducibility of the results. In addition, every tenth sample was spiked with a known amount of the constituents to be measured and reanalyzed to determine the percent recovery. These results were evaluated in regard to past AQC data on the precision, accuracy, and detection limits of each test. As an example, AQC results for Ra-226 and Se are tabulated on the following page.

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Parameter	Radium-226	Selenium
Detection Limit	0.05 pCi/l	0.005 mg/l
Percent Difference in Duplicate Measurements	0-1 pCi/l: 0-52% 22% Avg.†	0-0.1; 0-30%, 21% Avg.
	1-200 pCi/l: 0-8%, 5% Avg.	0.1-1.0: 9-32%, 15% Avg.
Percent Recovery from Spiked Samples	1-200 pCi/l: 79-104%, 93% Avg.	0-0.1 mg/l: 60-134%, 109% Avg.

† *0-1 pCi/l represents the concentration range being considered, 0-52% represents the range of the percent difference between duplicates, and 22% represents the average of these variations.*

On the basis of these findings, all analytical results reported for the survey were found to be acceptable with respect to the precision and accuracy control of this laboratory.

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STUDY PLAN

NEW MEXICO URANIUM MINING AND MILLING
WATER QUALITY INVESTIGATIONS

OBJECTIVES

1. Determine the impact of previous and existing discharges to ground and surface waters of the Grants-Mineral Belt and establish a data base for future National Pollutant Discharge Elimination System (NPDES) permits and uranium mining and milling license guidelines due to expanded mining and milling activities.

2. Determine whether the discharges from uranium mines and mills comply with existing and proposed NPDES permits and uranium-milling licenses.

3. Determine the composition of potable waters at uranium mines and mills.

4. Determine if NPDES non-filers exist in the study area.

5. Evaluate the adequacy of company monitoring networks, self-monitoring data, analytical procedures and reporting requirements.

BACKGROUND

Uranium ore was discovered in the Grants Mineral Belt in 1950 resulting in the construction of four processing mills, three of which are still operating. The early mining started in the shallow deposits of the Bluewater area and has progressed into the Ambrosia Lake area where shaft mines of greater than 1000 ft have been developed. Ground water from the overlying Dakoata aquifer and Westwater Canyon member of the Morrison Formation is pumped from these mines and discharged to surface waters. The industry is currently experiencing a major expansion with design and/or construction of three new mills and numerous mines.

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Since the discovery of ore and the construction of uranium mills, only a limited amount of company data has been developed on the chemical and radiochemical characteristics of the mining and milling wastes. The surface discharges from the mines receives only minimal treatment and companies have not made a concerted effort to prevent seepage from mill tailings ponds from entering subsurface water.

The NMEIA requested EPA, Region VI (letter dated September 25, 1974) to conduct a "definitive survey of the Grants Mineral Belt". Through meetings and subsequent correspondence, it was decided that the study will be conducted jointly by New Mexico Environmental Improvement Agency (NMEIA), National Field Investigations Center (NFIC) and Office of Radiation Programs-Las Vegas Facility (ORP).

The three uranium mills (Kerr-McGee, United Nuclear-Homestake Partners and Anaconda) and three mine (Kerr-McGee, United Nuclear and United Nuclear-Homestake Partners) water treatment facilities (ion exchange units or IX) operate under AEC licenses. These licenses have been transferred to NMEIA. The licenses require meeting conditions set forth in 10 CFR 20 of which the most significant is that liquid waste discharged to areas with controlled access have radium 226 levels equal to or less than 30 picocuries per liter (pCi/l).

NPDES permits have been issued for the Kerr-McGee mine discharges at Ambrosia Lake (ion exchange unit and Section 30W mine) and Churchrock, and the United Nuclear Corporation mine at Churchrock. The permit limitations are summarized in Table 1. Kerr-McGee has requested adjudicatory hearings on their permits.

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General New Mexico Water Quality Standards for perennial reaches of streams, including those formed by wastewater discharges, apply to the streams in the study area. The most significant provision of these standards is that radium 226 concentrations must be less than 30 pCi/l.

REQUIRED STUDIES

A. Reconnaissance Survey

A reconnaissance survey was conducted by personnel of NMEIA, ORP and NFIC during the period January 27-31, 1975. Company officials were contacted to obtain existing data and facility inspections were conducted at each of the mills and mines. A number of mine discharges, which are not covered by an NPDES permit, are believed to be reaching San Mateo Creek and its tributaries. Seepage from the Anaconda, Kerr-McGee and United Nuclear-Homestake Partners mill tailings piles has an extremely high potential of degrading water in the study area. Potable water supplies at the mines and mills is, for the most part, obtained from mine water treated by sedimentation followed in a few cases by selective ion exchange units which may not remove radium and most heavy metals, if present, from the mine water.

B. Industrial Waste Survey

Effluent monitoring of mine wastewaters will be conducted. Samples will also be collected of the mill tailings pond water to ascertain the type of pollutants which can enter the ground water.

Operating (active) mine discharges will be sampled for three consecutive days with 24-hour composite samples being collected. Mines currently under development and mill tailing piles will be monitored

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for 8 hours one day [Table 2 lists the stations and parameters which will be measured during the survey].

C. Stream Surveys

In conjunction with the industrial survey, selected stream stations will be sampled to determine possible water quality violations [Table 3]. These stations are located in San Mateo Creek upstream and downstream from the Johnny M Mine discharge and downstream from the confluence of Puertecito Creek; Puertecite Creek upstream of all discharges (upstream of United Nuclear-Homestake Partners IX discharge), downstream from Kerr-McGee Mill, and near the mouth at Rancho del Puerto; Rio Puerco downstream of United Nuclear and Kerr-McGee mines, upstream of Wingate plant, and in Gallup at Highway 666 Bridge; Rio Moquino upstream of Jackpile Mine; Rio Paguate at Paguate, at the Jackpile Mine Ford and at the Paguate Reservoir discharge; and the Rio San Jose at I-40 bridge east of Laguna.

The Rio Moquino, Rio Paguote and Rio San Jose are influenced by storm run-off of tailings and ore piles. These streams will be sampled during run-off.

D. Ground-Water Survey

Ground-water related activities will emphasize definition of the hydrogeologic environment and sampling of selected wells and springs to characterize existing water quality and relate it to uranium mining and milling waste discharge.

A separate study plan for this portion of the study has been prepared by ORP.

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LOGISTICS

All industrial, stream and well samples will be sent to the NFIC laboratory for analysis. Industrial samples will be split with the appropriate company. All samples will be field split for radiochemical analysis with ORP. Alpha and radium 226 screening tests at NFIC will be considered for further analyses by ORP for Th-230, Pb-210, Po-210, Th-228, and possibly Ra-228. All samples will be collected and analyzed following established NFIC Chain-of-Custody procedures. The size of sample and preservative required are summarized in Table 4.

TIME SCHEDULE*

January 27-31, 1975	Reconnaissance Survey
February 3-21, 1975	Develop sampling schedule and notify industries
February 24-25, 1975	Start setting up flow monitoring equipment
February 26-March 8, 1975	Sample industries and streams
February 24-March 14, 1975	Sample ground water

PERSONNEL

A. Field Survey

NFIC	1 Supervisory Engineer (coordinator) 1 Geologist 3 Technicians
NMEIA	3 Technicians

*Report on the study findings will be completed within 2-3 weeks following receipt of final analytical data.

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ORP	1 Hydro-Geologist 1 Health Physicist 1 Technician
Region VII (Kerr Water Lab)	1 Technician (part-time)

B. Report Preparation

NFIC	1 Engineer 1 Geologist 1 Technician (limited time)
NMEIA	1 Hydro-Geologist 1 Health Physicist
ORP	1 Hydro-Geologist 1 Health Physicist 1 Nuclear Chemist

EQUIPMENT

Gaging equipment

Peristaltic pump

Sampling and metering equipment

Pressure filtering units

Vehicles

4 Four-Wheel drive - 2 Denver and 2 Albuquerque (NFIC)

1 Sedan - Albuquerque (NFIC)

1 Van - Las Vegas (ORP)

1 Panel Truck - Kerr Center, Ada (ORP)

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TABLE 1

SUMMARY OF NPDES PERMIT CRITERIA

Company/Discharge	Period of Limitation	Parameters[1] TSS-mg/l Daily Avg.	TSS-mg/l Daily Max.	Total Uranium-mg/l Daily Avg.	Total Uranium-mg/l Daily Max.	Dissolved Radium 226-pCi/l Daily Avg.	Dissolved Radium 226-pCi/l Daily Max.	pH Range
Kerr-McGee Corp.	1/28/75-6/30/77	20	30	-	2	-	30	6.0-9.5
-Churchrock Mine Discharge	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0
-Section 30W Mine Discharge (Ambrosia Lake)	1/28/75-12/31/75	20	30	-	2	-	150	6.0-9.0
	1/1/76-6/30/77	20	30	-	2	-	30	6.0-9.0
	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0
-Ion Exchange Discharge (Ambrosia Lake)	1/28/75-12/31/75	20	30	-	1	-	100	6.0-9.0
	1/1/76-6/30/77	20	30	-	1	-	30	6.0-9.0
	7/1/77-1/27/80	20	30	-	1	-	3.3	6.0-9.0
United Nuclear Corporation -Churchrock Mine Discharge	1/28/75-12/31/75	100	200	-	2	-	30	6.0-9.5
	1/1/76-6/30/77	20	30	-	2	-	30	6.0-9.5
	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0

1/ In addition to these parameters, the companies are required to monitor flow, temperature, total molybdenum, total selenium and total vanadium.

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TABLE 2, Page 2

Station Number	Station Description	Number Days Sampled	Type Sample	Flow By	Analysis Required 2/															
					TSS	SO_4	Cl	Cu	Fe	Mo	Na	NH_3 & NO_3	Se	V	As	Mn	Co	U-Nat	Gross Alpha	Ra_{226}
9016	United Nuclear Corp. IX Discharge	4/	24-Hr. Comp. 8-Hr. Comp.	Weir or Gage	X		X			X	X	X	X	X		X		X	X	X
9017	United Nuclear Corp. Potable Water Supply	1	Grab	None						X		X	X		X				X	X
9018	United Nuclear-Homestake Partners IX Discharge	3	24-Hr. Comp.	Calculate from company meters	X		X			X	X	X	X	X		X		X	X	X
9019	United Nuclear-Homestake Partners Tailings Pile Decant	1	8-Hr. Comp.	None	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9021	Anaconda Co. Injection Well Feed	1	24-Hr. Comp.	Company Meter	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9023	United Nuclear Churchrock Mine	3	24-Hr. Comp.	Parshall	X		X			X	X	X	X	X		X		X	X	X
9024	United Nuclear Churchrock Potable Water Supply	1	Grab	None						X		X	X		X				X	X
9025	Kerr-McGee Churchrock Mine	3	24-Hr. Comp.	Weir & Recorder	X		X			X	X	X	X	X		X		X	X	X
9026	Kerr-McGee Churchrock Mine Potable Water Supply	1	Grab	None						X		X	X		X				X	X

1/ pH, conductivity and temperature will be measured periodically at all stations.
2/ Additional radiochemical (Th-230, pb-210, Po210, Th 228, Ra 228) will be required if gross alpha and radium 226 analysis indicate these compounds are present.
3/ Two separate discharges, sample will be flow composited from both sources.
4/ Three 24-hour composite samples will be collected if discharging; if however, all water is being used for solutions mining (i.e., recycled to the mines) then one 8-hr. composite will be collected.

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TABLE 2
INDUSTRIAL SAMPLING[1]

Station Number	Station Description	Number Days Sampled	Type Sample	Flow By	Analysis Required[2]															
					TSS	SO_4	Cl	Cu	Fe	Mo	Na	NH_3 & NO_3	Se	V	As	Mn	Co	U-Nat	Gross Alpha	Ra_{226}
9001	Kerr-McGee Ion Exchange Tailings By-Pass	3	24-Hr. Comp.	Parshall	X		X			X	X	X	X	X		X		X	X	X
9003	Kerr-McGee Sec. 30 W Mine Water	3	24-Hr. Comp.	Gage in Control Str.	X		X			X	X	X	X	X		X		X	X	X
9005	Kerr-McGee Sec. 19 Mine Water	1	8-Hr. Comp.	Bucket and Stopwatch	X		X			X	X	X	X	X		X		X	X	X
9007	Kerr-McGee Sec. 35 Mine Water	3	24-Hr. Comp.	Rectangular Weir	X		X			X	X	X	X	X		X		X	X	X
9009	Kerr-McGee Sec.[3] 36 Mine Water	3	24-Hr. Comp.	Gage or Bucket & Stopwatch	X		X			X	X	X	X	X		X		X	X	X
9011	Kerr-McGee Seepage below tailings pond	1	8-Hr. Comp.	None	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9012	Kerr-McGee Mill Potable Water Supply	1	Grab	None						X		X	X		X				X	X
9013	Kerr-McGee Sec. 35 Mine Potable Water Supply	1	Grab	None						X		X	X		X				X	X
9014	Ranchers Exploration Johnny M. Mine Water	1	8-Hr. Comp.	Gage	X		X			X	X	X	X	X		X		X	X	X
9015	Ranchers Exploration Johnny M. Mine Potable Water Supply	1	Grab	None						X		X	X		X				X	X

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TABLE 3
STREAM STATIONS[1/]

Station Number	Station Description	Number Days Sampled	Type Sample	Analysis Required[2/] Cl	Mo	Na	NO_3 & NH_3	Se	V	Mn	U-Nat	Gross Alpha	Ra_{226}
9030	San Mateo Creek at Highway 53 Bridge West of San Mateo	3	Grab	X	X	X		X	X	X	X	X	X
9032	San Mateo Creek upstream of Puertecito Creek	3	Grab	X	X	X		X	X	X	X	X	X
9034	Puertecito Creek upstream of Partner's IX Plant	3	Grab	X	X	X	X	X	X	X	X	X	X
9036	Puertecito Creek Downstream from Kerr-McGee Mill	3	Grab	X	X	X	X	X	X	X	X	X	X
9038	Puertecito Creek Near the Mouth of Rancho del Puerto	3	Grab	X	X	X	X	X	X	X	X	X	X
9040	San Mateo Creek at Highway 53 Bridge North of Grants	3	Grab	X	X	X		X	X	X	X	X	X
9050	Rio Puerco at Highway Bridge Downstream from United Nuclear and Kerr-McGee Mines	3	Grab	X	X	X		X	X	X	X	X	X
9052	Rio Puerco Upstream of Wingate Plant	3	Grab	X	X	X		X	X	X	X	X	X

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TABLE 3, Page 2

Station Number	Station Description	Number Days Sampled	Type Sample	Analysis Required 2/									
				Cl	Mo	Na	NO_3 & NH_3	Se	V	Mn	U-Nat	Gross Alpha	Ra_{226}
9054	Rio Puerco at Highway 666 Bridge, Gallup, N. Mex.	3	Grab	X	X	X		X	X	X	X	X	X
9060	Rio Paguate at Paguate	3/	Grab	X	X	X		X	X	X	X	X	X
9062	Rio Moquino Upstream of Jackpile Mine	3/	Grab	X	X	X		X	X	X	X	X	X
9064	Rio Paguate at Jackpile Ford	3/	Grab	X	X	X		X	X	X	X	X	X
9066	Rio Paguate at Paguate Reservoir Discharge	3/	Grab	X	X	X		X	X	X	X	X	X
9068	Rio San Jose at I-40 Bridge East of Laguna	3/	Grab	X	X	X		X	X	X	X	X	X

1/ pH, conductivity and temperature will be measured periodically at all stations.
2/ Additional radiochemical (Th-230, Pb-210, Po 210, Th-228, Ra-228) will be required if gross alpha and radium 226 analysis indicate these compounds are present.
3/ This station will be sampled for 1 to 3 days if surface run-off occurs.

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TABLE 4
PRESERVATIVES AND SAMPLE SIZE REQUIRED

Size of Sample	Preservative	Parameter
1 liter (unfiltered)	Iced	TDS, TSS, Sulfate, Chloride
1 liter (unfiltered)	5 ml HNO_3/l	Copper, iron, Moly, Sodium, Silenum, Vanadium, Arsenic, Manganese, Cobalt, Total Uranium
125 ml (unfiltered)	40 mg $HgCl_2$/l - Iced	Nitrate + Nitrite, Ammonia
2 l (filtered)	5 ml HNO_3/l	Gross alpha
8 l (filtered)*	5 ml Hcl/l	Dissolved Radium 226 Th-230, Pb-210, Po-210, Th-228, Ra-228

*4 liters each to NFIC and ORP.

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Appendix B

CHAIN OF CUSTODY PROCEDURES

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CHAIN OF CUSTODY PROCEDURES

General:

The evidence gathering portion of a survey should be characterized by the minimum number of samples required to give a fair representation of the effluent or water body from which taken. To the extent possible, the quantity of samples and sample locations will be determined prior to the survey.

Chain of Custody procedures must be followed to maintain the documentation necessary to trace sample possession from the time taken until the evidence is introduced into court. A sample is in your "custody" if:

1. It is in your actual physical possession, or

2. It is in your view, after being in your physical possession, or

3. It was in your physical possession and then you locked it up in a manner so that no one could tamper with it.

All survey participants will receive a copy of the survey study plan and will be knowledgeable of its contents prior to the survey. A pre-survey briefing will be held to re-appraise all participants of the survey objectives, sample locations and Chain of Custody procedures. After all Chain of Custody samples are collected, a de-briefing will be held in the field to determine adherence to Chain of Custody procedures and whether additional evidence type samples are required.

Sample Collection:

1. To the maximum extent achievable, as few people as possible should handle the sample.

2. Stream and effluent samples shall be obtained, using standard field sampling techniques.

3. Sample tags (Exhibit I) shall be securely attached to the sample container at the time the complete sample is collected and shall contain, at a minimum, the following information: station number, station location, date taken, time taken, type of sample, sequence number (first sample of the day - sequence No. 1, second sample - sequence No. 2, etc.), analyses required and samplers. The tags must be legibly filled out in ballpoint (waterproof ink).

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Chain of Custody Procedures (Continued)

Sample Collection (Continued)

4. Blank samples shall also be taken with preservatives which will be analyzed by the laboratory to exclude the possibility of container or preservative contamination.

5. A pre-printed, bound Field Data Record logbook shall be maintained to record field measurements and other pertinent information necessary to refresh the sampler's memory in the event he later takes the stand to testify regarding his action's during the evidence gathering activity. A separate set of field notebooks shall be maintained for each survey and stored in a safe place where they could be protected and accounted for at all times. Standard formats (Exhibits II and III) have been established to minimize field entries and include the date, time, survey, type of samples taken, volume of each sample, type of analysis, sample numbers, preservatives, sample location and field measurements such as temperature, conductivity, DO, pH, flow and any other pertinent information or observations. The entries shall be signed by the field sampler. The preparation and conservation of the field logbooks during the survey will be the responsibility of the survey coordinator. Once the survey is complete, field logs will be retained by the survey coordinator, or his designated representative, as a part of the permanent record.

6. The field sampler is responsible for the care and custody of the samples collected until properly dispatched to the receiving laboratory or turned over to an assigned custodian. He must assure that each container is in his physical possession or in his view at all times, or locked in such a place and manner that no one can tamper with it.

7. Colored slides or photographs should be taken which would visually show the outfall sample location and any water pollution to substantiate any conclusions of the investigation. Written documentation on the back of the photo should include the signature of the photographer, time, date and site location. Photographs of this nature, which may be used as evidence, shall also be handled recognizing Chain of Custody procedures to prevent alteration.

Transfer of Custody and Shipment:

1. Samples will be accompanied by a Chain of Custody Record which includes the name of the survey, samplers signatures, station number, station location, date, time, type of sample, sequence number, number of containers and analyses required (Fig. IV). When turning over the possession of samples, the transferor and transferee will sign, date and time the sheet. This record sheet

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allows transfer of custody of a group of samples in the field, to the mobile laboratory or when samples are dispatched to the NFIC - Denver laboratory. When transferring a portion of the samples identified on the sheet to the field mobile laboratory, the individual samples must be noted in the column with the signature of the person relinquishing the samples. The field laboratory person receiving the samples will acknowledge receipt by signing in the appropriate column.

2. The field custodian or field sampler, if a custodian has not been assigned, will have the responsibility of properly packaging and dispatching samples to the proper laboratory for analysis. The "Dispatch" portion of the Chain of Custody Record shall be properly filled out, dated, and signed.

3. Samples will be properly packed in shipment containers such as ice chests, to avoid breakage. The shipping containers will be padlocked for shipment to the receiving laboratory.

4. All packages will be accompanied by the Chain of Custody Record showing identification of the contents. The original will accompany the shipment, and a copy will be retained by the survey coordinator.

5. If sent by mail, register the package with return receipt requested. If sent by common carrier, a Government Bill of Lading should be obtained. Receipts from post offices and bills of lading will be retained as part of the permanent Chain of Custody documentation.

6. If samples are delivered to the laboratory when appropriate personnel are not there to receive them, the samples must be locked in a designated area within the laboratory in a manner so that no one can tamper with them. The same person must then return to the laboratory and unlock the samples and deliver custody to the appropriate custodian.

Laboratory Custody Procedures:

1. The laboratory shall designate a "sample custodian." An alternate will be designated in his absence. In addition, the laboratory shall set aside a "sample storage security area." This should be a clean, dry, isolated room which can be securely locked from the outside.

2. All samples should be handled by the minimum possible number of persons.

3. All incoming samples shall be received only by the custodian, who will indicate receipt by signing the Chain of Custody Record Sheet

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accompanying the samples and retaining the sheet as permanent records. Couriers picking up samples at the airport, post office, etc. shall sign jointly with the laboratory custodian.

4. Immediately upon receipt, the custodian will place the sample in the sample room, which will be locked at all times except when samples are removed or replaced by the custodian. To the maximum extent possible, only the custodian should be permitted in the sample room.

5. The custodian shall ensure that heat-sensitive or light-sensitive samples, or other sample materials having unusual physical characteristics, or requiring special handling, are properly stored and maintained.

6. Only the custodian will distribute samples to personnel who are to perform tests.

7. The analyst will record in his laboratory notebook or analytical worksheet, identifying information describing the sample, the procedures performed and the results of the testing. The notes shall be dated and indicate who performed the tests. The notes shall be retained as a permanent record in the laboratory and should note any abnormalities which occurred during the testing procedure. In the event that the person who performed the tests is not available as a witness at time of trial, the government may be able to introduce the notes in evidence under the Federal Business Records Act.

8. Standard methods of laboratory analyses shall be used as described in the "Guidelines Establishing Test Procedures for Analysis of Pollutants," 38 F.R. 28758, October 16, 1973. If laboratory personnel deviate from standard procedures, they should be prepared to justify their decision during cross-examination.

9. Laboratory personnel are responsible for the care and custody of the sample once it is handed over to them and should be prepared to testify that the sample was in their possession and view or secured in the laboratory at all times from the moment it was received from the custodian until the tests were run.

10. Once the sample testing is completed, the unused portion of the sample together with all identifying tags and laboratory records, should be returned to the custodian. The returned tagged sample will be retained in the sample room until it is required for trial. Strip charts and other documentation of work will also be turned over to the custodian.

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Chain of Custody Procedures (Continued)

11. Samples, tags and laboratory records of tests may be destroyed only upon the order of the laboratory director, who will first confer with the Chief, Enforcement Specialist Office, to make certain that the information is no longer required or the samples have deteriorated.

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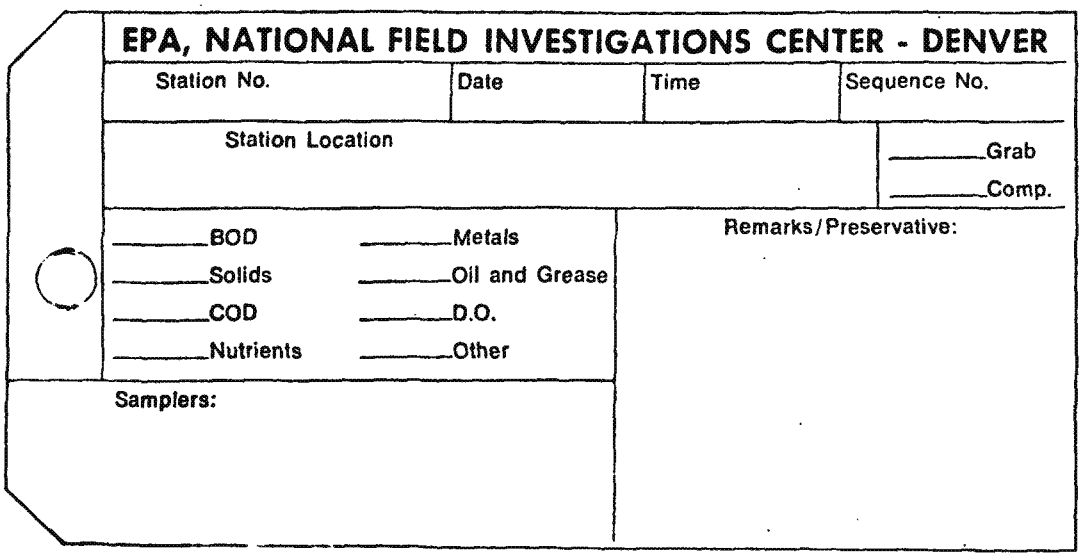
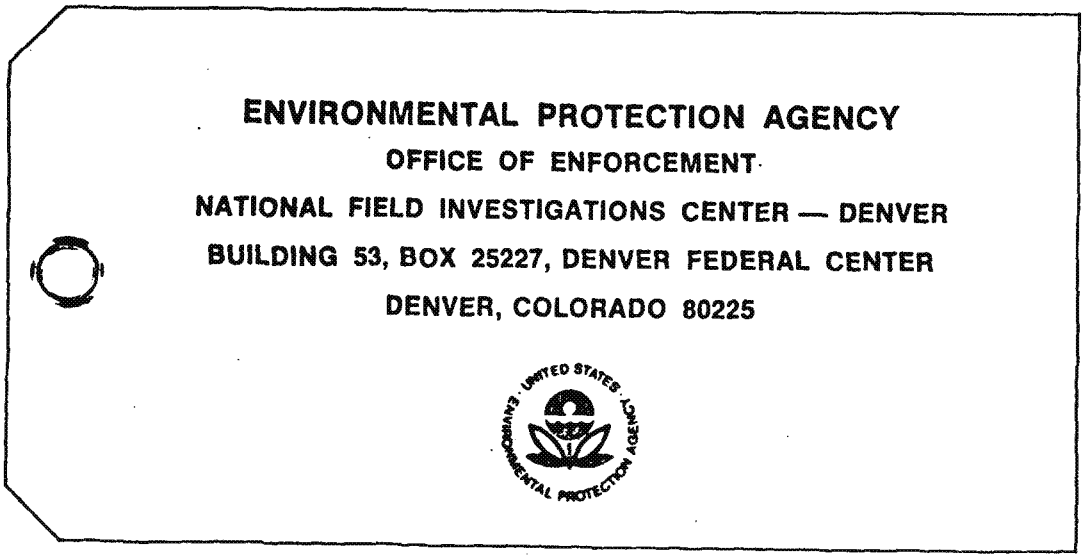
EXHIBIT I



FRONT



BACK

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EXHIBIT II

FOR _____ SURVEY, PHASE_____, DATE _____

TYPE OF SAMPLE_____

ANALYSES REQUIRED

STATION NUMBER	STATION DESCRIPTION	TOTAL VOLUME	TYPE CONTAINER	PRESERVATIVE	NUTRIENTS	BOD	COD	TOC	TOTAL SOLIDS	SUSPENDED SOLIDS	ALKALINITY	DO	pH*	CONDUCTIVITY*	TEMPERATURE*	TOTAL COLIFORM	FECAL COLIFORM	TURBIDITY	OIL AND GREASE	METALS	BACTI	PESTICIDES	HERB	TRACE ORGANICS	PHENOL	CYANIDE
REMARKS																										

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EXHIBIT III

Samplers: _____

_____

_____

_____

FIELD DATA RECORD

STATION	NUMBER	DATE	TIME	TEMPERATURE °C	CONDUCTIVITY μmhos/cm	pH S.U.	D.O. mg/l	Gage Ht. or Flow Ft. or CFS

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EXHIBIT IV

ENVIRONMENTAL PROTECTION AGENCY
Office Of Enforcement
NATIONAL FIELD INVESTIGATIONS CENTER– DENVER
Building 53, Box 25227, Denver Federal Center
Denver, Colorado 80225

CHAIN OF CUSTODY RECORD

SURVEY				SAMPLERS: *(Signature)*					
STATION NUMBER	STATION LOCATION	DATE	TIME	SAMPLE TYPE			SEQ. NO.	NO. OF CONTAINERS	ANALYSIS REQUIRED
				Water		Air			
				Comp.	Grab.				

Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Relinquished by: *(Signature)*	Received by Mobile Laboratory for field analysis: *(Signature)*	Date/Time
Dispatched by: *(Signature)* / Date/Time	Received for Laboratory by:	Date/Time
Method of Shipment:		

Distribution: Orig.– Accompany Shipment
1 Copy– Survey Coordinator Field Files

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Appendix C

CHEMICAL ANALYSES DATA
NEW MEXICO SURVEY
Feb. 26-Mar. 14, 1975

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CHEMICAL ANALYSES DATA
NEW MEXICO SURVEY
Feb. 26-Mar. 14, 1975

Sample No.†	Station Description	Analyses Performed				
		Dis. Grossα	±95%CL	Dis. Ra-226	±95%Cl	Total U
		(pCi/l)				(mg/l)
9001-30-0227	KM I-X TAILINGS BY-PASS	600	60	149	1	4.2
9001-30-0228	KM I-X TAILINGS BY-PASS	490	60	148	1	2.0
9001-30-0301	KM I-X TAILINGS By-PASS	430	50	157	1	1.3
9003-30-0227	KM SEC 30W MINE WATER	1300	100	174	1	1.3
9003-30-0228	KM SEC 30W MINE WATER	1400	100	161	1	6.1
9003-30-0301	KM SEC 30W MINE WATER	1400	100	154	1	6.7
9005-30-0227	KM SEC 19 MINE WATER	72	19	9.3	0.1	0.23
9007-30-0227	KM SEC 35 MINE WATER	3000	100	32	1	17
9007-30-0828	KM SEC 35 MINE WATER	2400	100	52	1	14
9007-30-0301	KM SEC 35 MINE WATER	2800	100	69	1	26
9009-30-0227	KM SEC 36 MINE WATER	570	60	113	1	2.6
9009-30-0228	KM SEC 36 MINE WATER	630	60	178	1	3.4
9009-30-0301	KM SEC 36 MINE WATER	850	70	101	1	3.0
9010-30-0227	KM SEC 36 MINE WATER	580	70	59	1	2.5
9010-30-0228	KM SEC 36 MINE WATER	510	60	72	1	2.3
9010-30-0301	KM SEC 36 MINE WATER	580	60	65	1	2.3
9011-01-0227	KM SEEPAGE BELOW T POND	144000	3000	65	1	160
9012-01-0226	KM POTABLE WATER SUP	510	60	0.54	0.02	-
9013-01-0226	KM SEC 35 WATER SUP	3000	150	43	1	-
9014-30-0228	RE JOHNNY M MINE WATER	20	10	1.6	0.1	0.12
9016-30-0227	UNC I-X DISCHARGE	1600	100	14.3	0.4	6.6
9016-30-0228	UNC I-X DISCHARGE	2300	100	39	1	11
9016-30-0301	UNC I-X DISCHARGE	1400	100	39	1	5.9
9017-01-0226	UNC POTABLE WATER SUP	1500	100	23.5	0.5	-
9018-30-0227	UN-HP I-X DISCHARGE	760	70	111	2	2.3
9018-30-0228	UN-HP I-X DISCHARGE	770	70	101	2	3.0
9018-30-0301	UN-HP I-X DISCHARGE	970	70	111	1	5.8
9019-30-0228	UN-HP T PILE DECANT	29000	1000	52	1	150
9021-30-0228	ANAC INJ WELL FEED	62500	1300	53	1	130
9023-30-0304	UNC CHURCHROCK MINE D	730	60	19.8	0.5	7.6
9023-30-0305	UNC CHURCHROCK MINE D	840	70	22.9	0.5	6.5

† *Sample numbers are presented by station number-sequence-date.*

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Sample No.	Station Description	Date	Analyses Performed				
			Dis. Grossα	±95%CL	Dis. Ra-226	±95%Cl	Total U
			(pCi/l)				(mg/l)
9023-30-0306	UNC CHURCHROCK MINE D		870	70	27.3	0.6	7.6
9023-01-0314	UNC CHURCHROCK MINE D		3100	90	53	1	20
9024-01-0303	UNC CHURCHROCK POTABLE WATER SUP		620	60	12.6	0.1	-
9025-30-0304	KM CHURCHROCK MINE DIS		240	40	8.1	0.3	0.97
9025-30-0305	KM CHURCHROCK MINE DIS		210	30	6.8	0.2	0.74
9025-30-0306	KM CHURCHROCK MINE DIS		230	40	8.7	0.2	0.72
9026-01-0303	KM CHURCHROCK H POTABLE WIS		120	30	6.5	0.1	-
9036-01-0226	PUERTECITO CK DS KM		1700	100	45	1	12
9036-01-0227	PUERTECITO CK DS KM		1400	100	47	1	6.2
9036-01-0228	PUERTECITO CK DS KM		1400	100	1	1	5.0
9038-01-0226	PUERTECITO CK @ RAN D PUERTO		1500	100	6.1	0.1	6.6
9038-01-0224	PUERTECITO CK @ RAN D PUERTO		1100	100	6.2	0.1	6.2
9038-01-0225	PUERTECITO CK @ RAN D PUERTO		750	60	7.2	0.1	4.7
9040-01-0226	SAN MATEO CK AT HWY 53		1000	80	1.09	0.03	4.7
9050-01-0303	RIO PUERCO DS UN & KM		500	50	0.97	0.05	5.0
9050-01-0304	RIO PUERCO DS UN & KM		470	50	2.54	0.05	3.8
9050-01-0305	RIO PUERCO DS UN & KM		490	60	2.60	0.05	3.8
9052-01-0303	RIO PUERCO US WINGATE		480	40	0.36	0.05	4.1
9052-01-0304	RIO PUERCO US WINGATE		510	60	0.43	0.02	4.8
9052-01-0305	RIO PUERCO US WINGATE		320	40	1.63	0.04	3.7
9054-01-0303	RIO PUERCO @ HWY 666		350	50	0.42	0.05	1.7
9054-01-0304	RIO PUERCO @ HWY 666		230	40	0.15	0.01	1.7
9054-01-0305	RIO PUERCO @ HWY 666		210	30	0.09	0.01	2.5
9060-01-0228	RIO PAGUATE @ PAGUATE		2.8	6.8	0.11	0.01	<.02
9062-01-0228	RIO MOQUINO		11.2	9.9	0.19	0.01	<.02
9064-01-0228	RIO PAGUATE @ JACKPILE FORD		270	40	4.8	0.1	1.2
9066-01-0228	RIO PAG @ PAG RES DIS		230	40	1.94	0.04	1.1
9068-01-0228	RIO SAN JOSE		38	18	0.37	0.02	0.10
9080-01-0304	KM SEC 36 3000 DRIFT		51	21	7.5	0.1	0.12
9081-01-0304	KM SEC 36 0900 DRIFT		47	20	8.7	0.1	0.05

ED_004985_00019312-00094

Sample No.	Station Description	Date	Analyses Performed				
			Dis. Grossα	±95%CL	Dis. Ra-226	±95%Cl	Total U
			(pCi/l)				(mg/l)
9082-01-0305	UNC CHURCHROCK POT WS @ SOWERS TR		1110	80	39.7	0.6	7.6
9101-01-0224			9	11	0.13	0.01	-
9102-01-0224			<3†	13	0.19	0.01	0.07
9103-01-0225			7	10	0.09	0.01	-
9104-01-0225			13	14	0.08	0.01	-
9105-01-0225			140	30	<0.05†	0.01	-
9106-01-0225			12	11	0.05	0.01	-
9107-01-0225			2500	200	0.72	0.02	14
9108-01-0225			47	23	0.34	0.02	-
9109-01-0225			39	17	0.13	0.01	-
9110-01-0225			<1†	6	<0.05†	0.01	-
9111-01-0225			7	9	0.24	0.01	-
9112-01-0225	GRANTS POTABLE		19	13	0.42	0.2	-
9113-01-0226			31	17	0.17	0.02	0.08
9114-01-0226			42	18	0.26	0.01	-
9115-01-0226			7	12	0.18	0.01	-
9116-01-0226			12	10	0.14	0.01	-
9117-01-0227	MONITOR, ANAC.		180	40	2.6	0.1	0.56
9118-01-0227			290	50	0.5	0.02	1.3
9119-01-0227			12	11	0.20	0.01	-
9120-01-0227			21	12	0.27	0.02	-
9121-01-0227			12	14	6.3	0.1	-
9123-01-0227			30	17	0.17	0.01	-
9123-01-0228			20	13	0.26	0.01	-
9124-01-0228			16	12	0.06	0.01	-
9125-01-0228			8	10	0.22	0.01	-
9126-01-0228			5	9	0.11	0.01	-
9127-01-0228			10	10	0.21	0.01	-
9128-01-0228			11	11	0.15	0.01	-
9129-01-0228			<1.6†	7	0.14	0.01	-
9130-01-0301			3	8	0.11	0.01	-
9131-01-0301			18	13	<0.05†	0.01	-
9132-01-0301			<1†	9	0.31	0.02	0.10
9133-01-0302			10	12	0.61	0.03	-

ED_004985_00019312-00095

Sample No.	Station Description	Date	Analyses Performed				
			Dis. Grossα	±95%CL	Dis. Ra-226	±95%Cl	Total U
			(pCi/l)				(mg/l)
9134-01-0303			8	11	0.24	0.01	0.04
9135-01-0303			400	70	1.92	0.04	2.6
9136-01-0303			22	16	0.27	0.02	-
9137-01-0303			10	9	0.68	0.03	-
9138-01-0303			6	8	0.64	0.02	-
9139-01-0305			14	11	0.22	0.01	-
9140-01-0305			6	10	0.10	0.01	-
9141-01-0305			3	7	0.12	0.01	0.02
9142-01-0305			9	9	0.16	0.01	-
9143-01-0305			14	9	0.83	0.04	-
9201-01-0226			110	40	3.6	0.1	1.0
9202-01-0226			86	31	0.30	0.02	-
9203-01-0226			33	15	0.07	0.01	-
9204-01-0226			8	13	0.14	0.01	-
9205-01-0226			170	40	0.18	0.01	-
9206-01-0226			56	25	0.60	0.02	-
9207-01-0227			410	120	1.15	0.03	-
9208-01-0227			49	35	4.0	0.1	-
9209-01-0227			<2†	10	1.95	0.04	-
9210-01-0227			45	29	0.26	0.02	-
9211-01-0227			<3†	15	0.20	0.01	-
9212-01-0303			112000	3000	4.9	0.1	-
9213-01-0303			8	32	6.6	0.1	-
9214-01-0303			14	34	1.18	0.03	-
9215-01-0303††			104	37	2.5	0.2	-
9216-01-0303			45	25	0.64	0.02	-
9217-01-0303			70	38	0.94	0.03	-
9218-01-0303			20	24	0.34	0.02	-
9219-01-0303			67	42	0.59	0.02	-
9220-01-0305			12	10	0.12	0.01	-
9221-01-0305			17	10	0.56	0.02	-

ED_004985_00019312-00096

Sample No.	Station Description	Date	Analyses Performed				
			Dis. Grossα	±95%CL	Dis. Ra-226	±95%Cl	Total U
			(pCi/l)				(mg/l)
9222-01-0305			2	9	0.57	0.02	-
9223-01-0305			4	9	0.37	0.02	-
9224-01-0305			24	12	0.13	0.01	-
9225-01-0305			12	15	0.29	0.01	-
9230-01-0228			<2†	6	0.31	0.02	-
9231-01-0228			10	10	1.7	0.05	-
9232-01-0228			18	13	3.7	0.08	0.02
9233-01-0228			2	4	0.18	0.02	0.04

† *Minimum detectable concentration*
†† *Gross alpha sample used for radium determination*

ED_004985_00019312-00097

Sample No.	Station Description	Date	Analyses Performed			
			Cu	Fe	As	Co
			mg/l			
9011-30-0227			1.9	1,500	1.1	0.94
9012-01-0226			-	-	<0.05	-
9013-01-0226			-	-	<0.05	-
9017-01-0226			-	-	<0.05	-
9019-38-0228			0.1	0.22	3.0	0.10
9021-30-0228			0.5	200	0.15	0.62
9024-01-0303			-	-	<0.05	-
9026-01-0303			-	-	<0.05	-

ED_004985_00019312-00098

Sample No.	Station Description	Date	Analyses Performed				
			Mo	Na	Se	V	Mn
			mg/l				
9001-30-0227	KM I-X TAILINGS BYPASS		2.5	180	0.06	0.7	0.03
9001-30-0228	KM I-X TAILINGS BYPASS		2.3	180	0.03	1.0	0.03
9001-30-0301	KM I-X TAILINGS BYPASS		2.4	180	0.07	1.0	0.03
9003-30-0227	KM Sec 30W MINE WATER		2.8	160	0.03	0.8	0.15
9003-30-0228	KM Sec 30W MINE WATER		2.6	160	0.04	0.7	0.18
9003-30-0301	KM Sec 30W MINE WATER		2.6	160	0.03	0.7	0.17
9005-30-0227	KM Sec 19 MINE WATER		0.6	120	<0.01	0.6	0.03
9007-30-0227	KM Sec 35 MINE WATER		5.2	190	0.08	0.6	0.09
9007-30-0228	KM Sec 35 MINE WATER		5.0	200	0.08	0.7	0.04
9007-30-0301	KM Sec 35 MINE WATER		4.7	210	0.04	1.0	0.06
9009-30-0227	KM Sec 36 MINE WATER		0.3	190	0.01	1.0	0.12
9009-30-0228	KM Sec 36 MINE WATER		0.3	190	<0.01	0.8	0.10
9009-30-0301	KM Sec 36 MINE WATER		0.3	180	0.01	0.8	0.12
9010-30-0227	KM Sec 36E MINE WATER		0.2	170	<0.01	0.8	0.10
9010-30-0228	KM Sec 36E MINE WATER		0.5	170	0.03	0.6	0.08
9010-30-0301	KM Sec 36E MINE WATER		0.3	170	0.01	0.4	0.08
9011-30-0227	KM SEEPAGE BELOW T POND		11	1,500	0.70	5.6	120
9012-01-0226	KM POTABLE WATER SUP		3.3	-	0.05	-	-
9013-01-0226	KM Sec 35 WATER SUP		8.2	-	0.02	-	-
9014-30-0228	RE JOHNNY M MINE WATER		0.3	60	<0.01	<0.3	0.01
9016-30-0227	UNC I-X DISCHARGE		4.4	310	0.11	<0.3	0.22
9016-30-0228	UNC I-X DISCHARGE		4.4	360	0.12	0.4	0.18
9016-30-0301	UNC I-X DISCHARGE		4.4	360	0.02	0.5	0.28
9017-01-0226	UNC POTABLE WATER SUP		6.0	-	0.11	-	-
9018-30-0227	UN-HP I-X DISCHARGE		1.3	140	0.33	0.4	0.05
9018-30-0228	UN-HP I-X DISCHARGE		1.5	140	0.33	<0.3	0.05
9018-30-0301	UN-HP I-X DISCHARGE		1.3	140	0.30	0.5	0.04
9019-30-0228	UN-HP T PILE DECANT		70	4,300	0.92	6.8	<0.01
9021-30-0228	ANAC INJ WELL FEED		0.2	1,200	0.03	6.3	340
9023-30-0304	UNC CHURCHROCK MINE D		0.2	100	0.06	0.5	0.05
9023-30-0305	UNC CHURCHROCK MINE D		0.2	100	0.06	0.4	0.06
9023-30-0306	UNC CHURCHROCK MINE D		0.1	90	<0.01	0.4	0.07
9023-01-0314	UNC CHURCHROCK MINE D		0.2	90	0.05	0.7	0.18
9024-01-0303	UNC CHURCHROCK POTABLE WATER SUP		1.9	-	0.06	-	-

ED_004985_00019312-00099

Sample No.	Station Description	Date	Analysis Performed				
			Mo	Na	Se	V	Mn
			mg/l				
9025-30-0304	KM CHURCHROCK MINE DIS		0.2	90	0.01	0.7	0.07
9025-30-0305	KM CHURCHROCK MINE DIS		0.2	100	0.01	0.8	0.08
9025-30-0306	KM CHURCHROCK MINE DIS		0.2	100	0.01	0.9	0.10
9026-01-0303	KM CHURCHROCK MINE POTABLE WATER SUP		1.4	-	0.01	-	-
9036-01-0226	PUERTECITO CK DS KM		1.4	180	0.13	1.0	0.25
9036-01-0227	PUERTECITO CK DS KM		1.5	180	0.16	0.8	0.24
9036-01-0228	PUERTECITO CK DS KM		1.5	180	0.16	0.6	0.26
9038-01-0226	PUERTECITO CK @ RAN d PUERTO		2.1	160	0.07	0.5	0.08
9038-01-0227	PUERTECITO CK @ RAN d PUERTO		0.3	130	0.04	1.9	0.13
9038-01-0028	PUERTECITO CK @ RAN d PUERTO		1.5	130	0.01	0.8	0.11
9040-01-0226	SAN MATEO CK @ HWY 53		1.3	130	0.02	<0.3	1.8
9050-01-0303	RIO PUERCO DS UN & KM		0.5	110	0.07	0.5	1.9
9050-01-0304	RIO PUERCO DS UN & KM		0.3	100	0.03	0.6	0.19
9050-01-0305	RIO PUERCO DS UN & KM		0.3	100	0.03	0.6	0.19
9052-01-0303	RIO PUERCO US WINGATE		0.2	100	0.01	0.9	1.7
9052-01-0304	RIO PUERCO US WINGATE		0.2	90	0.01	0.5	0.61
9052-01-0305	RIO PUERCO US WINGATE		0.2	90	0.01	0.3	1.1
9054-01-0303	RIO PUERCO @ HWY 666		0.1	90	<0.01	0.3	0.12
9054-01-0304	RIO PUERCO @ HWY 666		0.2	90	<0.01	0.6	2.1
9054-01-0305	RIO PUERCO @ HWY 666		0.2	90	<0.01	0.6	2.0
9060-01-0228	RIO PAGUATE @ PAGUATE		<0.1	30	<0.01	0.6	0.11
9062-01-0228	RIO MOQUINO		0.2	70	<0.01	1.8	0.15
9064-01-0228	RIO PAGUATE @ JACKPILE FORD		0.2	120	0.05	0.5	0.28
9066-01-0228	RIO PAG @ PAG RES DIS		0.2	160	<0.01	0.6	0.14
9068-01-0228	RIO SAN JOSE		0.1	230	<0.01	<0.3	0.09
9080-01-0304	KM Sec 36 0000 DRIFT		0.1	220	0.01	<0.3	0.02
9081-01-0304	KM Sec 36 0900 DRIFT		0.4	260	<0.01	<0.3	0.06
9082-01-0305	UNC CHURCHROCK POT WS @ SOWERS TR		<0.1	100	0.06	0.6	0.03
9101-01-0224					-	-	
9102-01-0224	G WILCOX - MURRAY ACRES				1.06	<0.3	
9103-01-0225					-	-	
9104-01-0225					-	-	
9105-01-0225					-	-	
9106-01-0225					-	-	

ED_004985_00019312-00100

Sample No.	Station Description	Date	Analysis Performed				
			Mo	Na	Se	V	Mn
			mg/l				
9107-01-0225	C WORTHEN, BROADVIEW ACRES				1.06	0.3	
9108-01-0225					-	-	
9109-01-0225					-	-	
9110-01-0225					-	-	
9111-01-0225					-	-	
9112-01-0225					-	-	
9113-01-0226	C MEADOR - BROADVIEW ACRES				0.20	0.3	
9114-01-0226					-	-	
9115-01-0226					-	-	
9116-01-0226					-	-	
9117-01-0227					0.01	0.3	
9118-01-0227					0.01	0.8	
9119-01-0227					<0.01	0.9	
9120-01-0227					0.01	1.0	
9121-01-0227					0.01	0.8	
9122-01-0227					-	-	
9123-01-0228					0.01	1.1	
9124-01-0228					-	-	
9125-01-0228					-	-	
9126-01-0228					-	-	
9127-01-0228					-	-	
9128-01-0228					-	-	
9129-01-0228					0.02	1.3	
9130-01-0301					-	-	
9131-01-0301					-	-	
9132-01-0301	MARCUS WINDMILL				0.13	<0.3	
9133-01-0302					-	-	
9134-01-0303					<0.01	1.3	
9135-01-0303	UNHP WELL P				1.52	0.4	
9136-01-0303					-	-	
9137-01-0303					-	-	
9138-01-0303					<0.01	<0.3	
9139-01-0305					-	-	
9140-01-0305					<0.01	<0.3	

ED_004985_00019312-00101

Sample No.	Station Description	Date	Analysis Performed				
			Mo	Na	Se	V	Mn
					mg/l		
9141-01-0305					<0.01	<0.3	
9142-01-0305					<0.01	<0.3	
9143-01-0305					-	-	
9201-01-0226					<0.01	<0.3	
9202-01-0226					-	-	
9203-01-0226					-	-	
9204-01-0226					-	-	
9205-01-0226					-	-	
9206-01-0226					-	-	
9207-01-0227					<0.01	0.4	
9208-01-0227	06 KM 43 14N, 9W Sec 32				0.29	0.8	
9209-01-0227					0.01	<0.3	
9210-01-0227					-	-	
9211-01-0227					<0.01	0.5	
9212-01-0303					-	-	
9213-01-0303					<0.01	0.6	
9214-01-0303					0.02	<0.3	
9215-01-0303					<0.01	<0.3	
9216-01-0303					-	-	
9217-01-0303					-	-	
9218-01-0303					-	-	
9219-01-0303					0.01	<0.3	
9220-01-0305					-	-	
9221-01-0305					0.01	<0.3	
9222-01-0305					-	-	
9223-01-0305					<0.01	<0.3	
9224-01-0305					-	-	
9225-01-0305					-	-	
9230-01-0228					<0.01	<0.3	
9231-01-0228					-	-	
9232-01-0228					<0.01	<0.3	
9233-01-0228					<0.01	0.3	

ED_004985_00019312-00102

Sample No.	Station Description	Date	Analyses Performed				
			TSS	SO_4	Cl	NH_3 †	$NO_2 + NO_3$ †
			mg/l				
9001	KERR-MCGEE I-X TAILINGS BYPASS	Feb. 26	-	-	-	0.06	0.88
		Feb. 27	16	-	45	0.06	0.79
		Feb. 28	31	-	68	0.05	0.90
		Mar. 1	29	-	20	-	-
9003	KERR-MCGEE Sec 30W MINE WATER	Feb. 26	-	-	-	0.19	1.3
		Feb. 27	26	-	52	0.21	1.2
		Feb. 28	23	-	49	0.18	0.94
		Mar. 1	17	-	53	-	-
9005	KERR-MCGEE Sec 19 MINE WATER	Feb. 27	16	-	7.9	0.13	1.4
9007	KERR-MCGEE Sec 35 MINE WATER	Feb. 26	-	-	-	0.11	0.22
		Feb. 27	120	-	9.4	0.15	0.39
		Feb. 28	93	-	7.6	0.06	0.44
		Mar. 1	86	-	8.4	-	-
9009	KERR-MCGEE Sec 36 W MINE WATER	Feb. 26	-	-	-	0.07	0.30
		Feb. 27	36	13	-	0.04	0.21
		Feb. 28	44	13	-	0.04	0.26
		Mar. 1	33	13	-	-	-
9010	KERR-MCGEE Sec 36 E MINE WATER	Feb. 26	-	-	-	0.04	0.34
		Feb. 27	32	14	-	0.03	0.26
		Feb. 28	29	17	-	1.8	0.28
		Mar. 1	27	14	-	-	-
9011	KERR-MCGEE SEEPAGE BELOW TAILINGS POND	Feb. 27 COMP	38	2,200	15,000	-	-
		Feb. 27 GRAB	48	2,200	16,000	460	16
9012	KERR-MCGEE POTABLE WATER SUPPLY	Feb. 26	-	-	-	0.13	1.0
9013	KERR-MCGEE Sec 35 WATER SUPPLY	Feb. 26	-	-	-	0.18	0.32
9014	RANCHERS EXPL JOHNNY M MINE WATER	Feb. 28	7	6.1	-	-	-
9016	UNITED NUCLEAR CORP 1-X DISCHG	Feb. 26	-	-	-	0.07	0.28
		Feb. 27	5	-	190	0.04	0.07
		Feb. 28	7	-	200	0.01	0.06
		Mar. 1	3	-	190	-	-
9017	UNC POTABLE WATER SUPPLY	Feb. 26	-	-	-	0.08	0.06
9018	UNC-HP I-X DISCHARGE	Feb. 26	-	-	-	0.05	2.1
		Feb. 27	7	-	49	0.06	2.1
		Feb. 28	16	-	49	0.10	2.2
		Mar. 1	7	-	49	-	-

† *Grab Samples*

07103

ED_004985_00019312-00103

Sample No.	Station Description	Date	Analyses Performed				
			TSS	SO_4	Cl	NH_3†	$NO_2 + NO_3$†
			mg/l				
9019	UNC-HP TAILINGS PILE DECANT	Feb. 28	5	4,300	1.5	4.4	4.4
9021	ANACONDA CO INJECTION WELL FEED	Feb. 27	-	4,900	-	69	7.4
		Feb. 28	3	-	65	-	-
9023	UN CHURCHROCK MINE DISCHARGE	Mar. 3	-		-	0.04	0.23
		Mar. 4	33		5.2	0.03	0.24
		Mar. 5	47		4.5	-	-
		Mar. 6	71		5.0	0.07	0.20
		Mar. 14	320		-	-	-
9024	UNC POTABLE WATER SUPPLY	Mar. 3	-		-	0.05	0.25
9025	KM CHURCHROCK MINE DISCHARGE	Mar. 3	-		-	0.03	0.34
		Mar. 4	38		0	0.06	0.45
		Mar. 5	45		0.5	-	-
		Mar. 6	58		3.2	0.07	0.79
9026	KM CHURCHROCK MINE POTABLE WS	Mar. 3	-		-	0.02	0.42
9036	PUERTECITO CREEK	Feb. 26			72	0.38	2.3
		Feb. 27			83	0.40	1.8
		Feb. 28			71	0.26	2.9
9038	PUERTECITO CREEK	Feb. 26			42	0.10	0.22
		Feb. 27			48	0.13	0.06
		Feb. 28			48	0.11	0.25
9040	SAN MATEO CREEK	Feb. 26			39	-	-
9050	RIO PUERCO @ HWY BRIDGE	Mar. 3			5.9		
		Mar. 4			3.8		
		Mar. 5			3.8		
9052	RIO PUERCO UPSTREAM OF WINGATE PLANK	Mar. 3			6.9		
		Mar. 4			6.8		
		Mar. 5			6.5		
9054	RIO PUERCO @ HWY 666	Mar. 3			23		
		Mar. 4			20		
		Mar. 5			17		
9068	RIO-PAGUATE	Feb. 28			0.6		
9062	RIO MOQUINO	Feb. 28			8.3		
9064	RIO PAGUATE	Feb. 28			2.0		
9066	RIO PAGUATE	Feb. 28			15		
9068	RIO SAN JOSE	Feb. 28			154		

† *Grab Samples*

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Sample No.	Station Description	Date	Analyses Performed				
			TDS	SO_4	Cl	NH_3	$NO_2 + NO_3$
			mg/l				
9101	MT TAYLOR MILL WORKS OLD RTE 66	Feb. 24	780		25	0.04	4.2
9102	G WILCOX - MURRAY ACRES	Feb. 24	2,300		180	0.01	5.5
9103	Q CONNERLY - ZUNI TRAILER PARK	Feb. 25	880		33	<0.01	6.2
9104	T SIMPSON - MURRAY ACRES	Feb. 25	1,400		37	<0.01	0.08
9105	SCHWAGERTY - MURRAY ACRES	Feb. 25	1,300		46	<0.01	1.00
9106	J PITMAN - BROADVIEW ACRES	Feb. 25	1,300		39	<0.01	0.33
9107	C WORTHEN - BROADVIEW ACRES	Feb. 25	3,800		260	0.01	14
9108	PITNEY - MURRAY ACRES	Feb. 25	2,200		110	0.01	3.3
9109	T A CHAPMAN - MURRAY ACRES	Feb. 25	1,300		9.5	0.01	2.5
9110	1-X WATER HOLIDAY INN - GRANTS	Feb. 25	430		55	0.01	0.11
9111	C&E CONCRETE - GRANTS	Feb. 26	560		30	0.05	3.4
9112	GRANTS CITY HALL-CITY WATER SUP	Feb. 26	730		32	0.02	0.47
9113	C MEADOR - BROADVIEW ACRES	Feb. 26	1,600		120	0.01	2.9
9114	BELL - TRAILER PARK	Feb. 26	970		34	<0.01	0.08
9115	COWELL - SE OF ANACONDA	Feb. 26	1,100		6.2	0.02	3.9
9116	MILAN WELL #1 CITY WATER	Feb. 26	500		14	0.02	1.6
9117	ANACONDA - MONITOR WELL	Feb. 27	2,300		11	0.03	1.5
9118	ANACONDA - WELL 2	Feb. 29	1,900		270	0.64	9.0
9119	ANACONDA - WELL 4	Feb. 27	880		42	0.13	5.7
9120	ANACONDA - MEXICAN CAMP	Feb. 27	490		10	0.04	0.73
9121	ANACONDA - GERRYHILL Sec 5	Feb. 27	2,000		4.2	0.14	0.05
9122	ANACONDA - NORTH WELL	Feb. 27	1,900		4.2	0.08	1.3
9123	ANACONDA - ENGINEERS' WELL	Feb. 28	960		61	0.09	3.20
9124	ANACONDA - BERRYHILL HOUSE	Feb. 28	940		65	0.05	0.80
9125	ANACONDA - LOS BLUEWATER	Feb. 28	1,000		12	0.05	0.95
9126	ANACONDA - ROUNDY	Feb. 28	1,100		110	0.04	6.5
9127	ANACONDA - FRED FREAS	Feb. 28	540		18	0.03	0.03
9128	ANACONDA - LEROY CHAPMAN	Feb. 28	490		18	0.03	1.4
9129	ANACONDA - JACK FREAS	Feb. 28	780		54	0.04	2.5
9130	N MARQUEZ - HOUSE WELL	Mar. 1	720		4.8	0.04	0.06
9131	C SANDOVAL - WINDMILL	Mar. 1	660		27	0.06	1.2
9132	N MARQUEZ - WINDMILL	Mar. 1	2,200		43	0.22	24
9133	G ENYART - GRANTS	Mar. 2	1,600		50	0.26	0.97

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Sample No.	Station Description	Date	Analyses Performed				
			TDS	SO_4	Cl	NH_3	$NO_2 + NO_3$
			mg/l				
9134	UN HP SUPPLY WELL 2	Mar. 3	1,600		0.2	0.03	0.42
9135	UN HP WELL D	Mar. 3	4,500		340	1.0	2.6
9136	UN HP SUPPLY WELL 1	Mar. 3	2,000		<0.2	0.07	0.28
9137	ERWIN WELL - GALLUP	Mar. 5	740		14	0.09	0.02
9138	BOARDMAN TRAILER PARK - GALLUP	Mar. 5	930		<0.2	0.50	1.2
9139	G HASSLER - GALLUP	Mar. 5	880		98	0.02	27
9140	DIXIE WELL - GALLUP	Mar. 5	1,500		<0.2	0.30	0.16
9141	CHURCHROCK VILLAGE	Mar. 5	720		0.5	0.50	0.18
9142	WHITE WELL - GALLUP	Mar. 5	620		630	0.01	0.02
9143	TOGAY WELL - GALLUP	Mar. 5	340		14	0.02	8.0
9201	PHIL HARRIS (WILCOXSON) KM 46	Feb. 26	1,900		23	0.14	0.09
9202	COUNTY LINE STOCK TANK KM 52	Feb. 26	2,100		56	0.06	14
9203	NAVAHO WIND MILL KM 45	Feb. 26	400		6.8	0.02	4.0
9204	INGERSOLL RAND KM 49	Feb. 26	2,200		36	0.05	18
9205	BINGHAM (RAGLAND) KM 47	Feb. 26	2,000		40	0.04	4.7
9206	MARQUEZ (RAGLAND) KM 63	Feb. 26	1,900		34	0.05	44
9207	KM-S-12	Feb. 27	14,000		3,100	0.50	0.04
9208	KM-43	Feb. 27	7,800		38	NS	NS
9209	KM-44	Feb. 27	2,700		17	0.66	11
9210	KM-51	Feb. 27	6,300		44	0.30	79
9211	KM-48	Feb. 27	4,100		31	0.80	1.3
9212	KM SEEPAGE RETURN	Mar. 3	36,000		3,100	590	12
9213	KM B-2	Mar. 3	8,900		3,400	0.12	0.25
9214	KM 36-2	Mar. 3	9,100		1,700	2.9	8.0
9215	KM 46	Mar. 3	3,200		100	10	2.0
9216	KM 47	Mar. 3	2,600		74	0.80	2.6
9217	KM 50	Mar. 3	4,700		470	9.1	16
9218	KM 51	Mar. 3	4,800		61	0.16	0.40
9219	KM 52	Mar. 3	6,700		1,300	0.08	1.3
9220	HARDGROUND FLATS WELL CRKM 2	Mar. 5	850		0.2	0.03	0.28
9221	E PUERCO R WELL CRKM 11	Mar. 5	340		14	0.04	14

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Sample No.	Station Description	Date	Analyses Performed				
			TDS	SO_4	Cl	NH_3	$NO_2 + NO_3$
			mg/l				
9222	PUERCO WELL CRKM 16	Mar. 5	1,600		<0.2	34	0.01
9223	PIPELINE ROAD WELL CRK M 5	Mar. 5	880		<0.2	1.4	1.6
9224	NOSEROCK WELL CRKM 3	Mar. 5	980		<0.2	0.07	0.03
9225	NORTHEAST PIPELINE WELL CRK M10	Mar. 5	2,300		8.1	0.12	0.01
9230	ANACONDA JACKPILE WELL 4	Feb. 28	540		<0.2	0.05	0.05
9231	ANACONDA JACKPILE WELL P 10	Feb. 28	1,200		0.5	0.08	0.04
9232	ANACONDA JACKPILE WELL - NEW SHOP	Feb. 28	1,400		0.5	0.14	0.05
9233	PUGUATE MUNICIPAL WELL	Feb. 28	340		6.6	0.08	0.20

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Appendix D

SELENIUM
EPA WATER QUALITY CRITERIA 1972

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SELENIUM*

The toxicity of selenium resembles that of arsenic and can, if exposure is sufficient, cause death. Acute selenium toxicity is characterized by nervousness, vomiting, cough, dyspnea, convulsions, abdominal pain, diarrhea, hypotension, and respiratory failure. Chronic exposure leads to marked pallor, red staining of fingers, teeth and hair, debility, depression, epistaxis, gastrointestinal disturbances, dermatitis, and irritation of the nose and throat. Both acute and chronic exposure can cause odor on the breath similar to garlic (The Merck Index of Chemicals and Drugs 1968).[336] The only documented case of selenium toxicity from a water source, uncomplicated with selenium in the diet, concerned a three-month exposure to well water containing 9 mg/l (Beath 1962).[331]

Although previous evidence suggested that selenium was carcinogenic (Fitzhugh et al. 1944),[332] these observations have not been borne out by subsequent data (Volganev and Tschenkes 1967).[346] In recent years, selenium has become recognized as a dietary essential in a number of species (Schwarz 1960,[341] Nesheim and Scott 1961,[338] Oldfield et al. 1963[339]).

Elemental selenium is highly insoluble and requires oxidation to selenite or selenate before appreciable quantities appear in water (Lakin and Davidson 1967).[335] There is evidence that this reaction is catalyzed by certain soil bacteria (Olson 1967).[340]

No systematic investigation of the forms of selenium in excessive concentrations in drinking water sources has been carried out. However, from what is known of the solubilities of the various compounds of selenium, the principal inorganic compounds of selenium would be selenite and selenate. The ratio of their individual occurrences would depend primarily on pH. Organic forms of selenium occurred in seleniferous soils and had sufficient mobility in an aqueous environment to be preferentially absorbed over selenate in certain plants (Hamilton and Beath 1964).[334] However, the extent to which these compounds might occur in source waters is essentially unknown. Toxicologic examination of plant sources of selenium revealed that selenium present in seleniferous grains was more toxic than inorganic selenium added to the diet (Franke and Potter 1935).[333]

Intake of selenium from foods in seleniferous areas (Smith 1941),[342] may range from 600 to 6,340 μg/day, which approach estimated levels related to symptoms of selenium toxicity in man based on urine samples (Smith et al. 1936,[343] Smith and Westfall 1937[344]). If data on selenium in foods (Morris and Levander 1970)[337] are applied to the average consumption of foods (U.S. Department of Agriculture, Agriculture Research Service, Consumer and Food Economics Research Division 1967),[345] the normal dietary intake of selenium is about 200 μg/day.

If it is assumed that two liters of water are ingested per day, a 0.01 mg/l concentration of total selenium would increase the normal total dietary intake by 10 per cent (20 μg/day). Considering the range of selenium in food associated with symptoms of toxicity in man, this would provide a safety factor of from 2.7 to 29. A serious weakness in these calculations is that their validity depends on an assumption of equivalent toxicity of selenium in food and water, in spite of the fact that a considerable portion of selenium associated with plants is in an organic form. Adequate toxicological data that specifically examine the organic and the inorganic selenium compounds are not available.

Recommendation

Because the defined treatment process has little or no effect on removing selenium, and because there is a lack of data on its toxic effects on humans when ingested in water, it is recommended that public water supply sources contain no more than 0.01 mg/l selenium.

* *Water Quality Criteria, 1972, Environmental Protection Agency, Washington, D.C.*

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Technical Note
ORP/LV-75-4

SUMMARY OF GROUND-WATER QUALITY IMPACTS OF URANIUM MINING AND MILLING IN THE GRANTS MINERAL BELT, NEW MEXICO

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August 1975

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PREFACE

The Office of Radiation Programs of the Environmental Protection Agency carries out a national program designed to evaluate population exposure to ionizing and non-ionizing radiation and to promote development of controls necessary to protect the public health and safety.

Within the Office of Radiation Programs, the Las Vegas Facility (ORP-LVF) conducts in-depth field studies of various radiation sources (e.g., nuclear facilities, uranium mill tailings, and phosphate mills) to provide technical data for environmental impact statement reviews as well as needed information on source characteristics, environmental transport, critical pathways for population exposure, and dose model validation.

This report summarizes the results of the ground-water study conducted by ORP-LVF during February and March 1975 in the Grants Mineral Belt area of New Mexico. The final technical report, "Ground-Water Ouality Impacts of Uranium Mining and Milling in the Grants Mineral Belt, New Mexico", will be published at a later date as EPA-520/6-75-013.

Readers of this report are encouraged to inform the Office of Radiation Programs of any omissions or errors. Comments or requests for further information are also invited.

Donald W. Hendricks
Director, Office of
Radiation Programs, LVF

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PURPOSE OF STUDY

In September 1974, the State of New Mexico Environmental Improvement Agency (NMEIA) made a request of Region VI of the U.S. Environmental Protection Agency (USEPA) to conduct a definitive survey of the Grants Mineral Belt area (Wright, 1974). At this time, a summary report evaluating the problem areas in the study area was also prepared by Region VI (Keefer, 1974). Briefly, the water-quality impacts associated with ongoing and projected uranium mining and milling in the Grants Mineral Belt of New Mexico were unknown. Whether a problem existed was questionable but worthy of investigation because of the toxic nature of the effluents and their persistence in the environment. The study areas of most concern were located near Churchrock, Ambrosia Lake-Grants, and Laguna-Paguate.

In late November 1974, the Office of Radiation Programs-Las Vegas Facility (ORP-LVF) and the National Enforcement Investigations Center (NEIC) were requested by Region VI to provide direct assistance to the NMEIA to conduct the study.

Representatives of ORP-LVF, NEIC, and NMEIA completed a field reconnaissance of the study area during the week of January 24, 1975. Industry representatives were contacted, arrangements were made for site access, and sampling locations and collection schedules were finalized after reviewing company monitoring programs. Study plans were prepared by both ORP-LVF and NEIC defining study participants, responsibilities, and specific analyses to be completed per location by each laboratory.

Subsequent meetings between the three participating agencies resulted in a final study plan which defined the following study objectives to the satisfaction of NMEIA (Bond, 1975):

1. Assess the impacts of waste discharges from uranium mining and milling on surface waters and ground waters of the Grants Mineral Belt.

2. Determine if discharges comply with all applicable regulations, standards, permits, and licenses.

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3. Evaluate the adequacy of company water quality monitoring networks, self-monitoring data, analytical procedures, and reporting requirements.

4. Determine the composition of potable waters at uranium mines and mills.

5. Develop priorities for subsequent monitoring and other follow-up studies.

Ground-water aspects of objectives 1, 3, and 5 were the responsibility of ORP-LVF, whereas the remaining objectives were pursued by NEIC.

Actual sample collection began in late February 1975 in the Ambrosia Lake-Bluewater area. It proceeded to Paguate-Jackpile and was finally completed in the Gallup-Churchrock area in early March 1975. Laboratory analyses for the trace metals, gross alpha, and radium-226 were completed by NEIC. The other radiological analyses were completed by the Environmental Monitoring and Support Laboratory (EMSL), Las Vegas. Radiometric analyses were assigned the highest priority at each laboratory and were completed in July 1975.

SUMMARY AND CONCLUSIONS

TASK I: Assess the Impacts of Waste Discharges from Uranium Mining and Milling on Ground Waters of the Grants Mineral Belt.

1. Ground water is the principal source of water supply in the study area. Extensive development of ground water from the San Andres Limestone aquifer occurs in the Grants-Bluewater area where the water is used for agriculture, public water supply, and uranium mill feed water. Development of shallow, unconfined aquifers in the alluvium also occurs in this area. Principal ground-water development in the mining areas at Ambrosia Lake, Jackpile-Paguate, and Churchrock is from the Morrison Formation and, to a lesser extent, from the Dakota Sandstone or the Tres Hermanos Member of the Mancos Shale. The Gallup water supply is derived primarily from deep wells completed in the Gallup Sandstone using well fields located east and west of the urban area and 11 kilometers north of the city.

2. In proximity to the mines and mills and adjacent to the principal surface drainage courses, shallow ground-water contamination results from the infiltration of (1) effluents from mill tailings ponds, (2) mine drainage water that is first introduced to settling lagoons and thence to watercourses, and (3) discharge (tailings) from ion exchange plants. In the case of the Anaconda mill, seepage from the tailings ponds and migration of wastes injected into deep bedrock formations are observed in the San Andres Limestone and in the alluvium, both of which are potable aquifers. With the exception of seepage from the Kerr-McGee Section 36 mine in Ambrosia Lake, significant amounts of wastewater from the remaining mines and mills probably does not return to known bedrock aquifers. Deterioration of water quality results from conventional underground mining as a result of penetration or disruption of the ore body. The most dramatic changes are greatly increased dissolved radium and uranium. Induced movement of naturally saline ground water into potable aquifers is also likely but undocumented. Similarly, the ground-water quality impacts of solution (in situ) mining are unknown.

3. The Grants, Milan, Laguna, and Bluewater municipal water supplies have not been adversely affected by uranium mining and milling operations to date. For the Grants and Milan areas, chemical data from 1962 to the present indicate that near the Anaconda mill some observation wells have

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increased slightly in total dissolved solids, sulfate, chloride and gross alpha but domestic wells have generally remained unchanged. Projections made in 1957 of gross nitrate deterioration of ground water have not been substantiated by subsequent data. Of the municipal supply wells in the study area, the Bluewater well bears additional monitoring because of its location relative to the Anaconda tailings ponds.

4. Contamination of the Gallup municipal ground-water supply by surface flows, consisting mostly of mine drainage, has not occurred and is extremely unlikely because of geologic conditions in the well field and the depth to productive aquifers. Another well field north of the City will, in no way, be affected by the drainage.

5. With the exception of the areas south and southwest of the United Nuclear-Homestake Partners mill, widespread ground-water contamination from mining and milling was not observed in the study area. Throughout the study area widespread contamination of ground water with radium was not observed despite concentrations of as much as 178 pCi/l in mine and mill effluents. Radium removal is pronounced, probably due to sorptive capacity of soils in the area. In the vicinity of the Anaconda mill, radium and nitrate concentrations in the alluvial aquifer decline with distance from the tailings ponds, but neither parameter exceeds drinking water standards.

6. Ground water in at least part of the shallow aquifer developed for domestic water supply downgradient from the United Nuclear-Homestake Partners mill is contaminated with selenium. Alternative water supplies can be developed using deep wells completed in the Chinle Formation or in the San Andres Limestone. Potential well sites are located in the developments affected and in the adjacent area. A third alternative includes connecting to the Milan municipal system. Further evaluations are necessary to determine the best course of action.

7. Mining practices, per se, have an adverse effect on natural water quality. Initial penetration and disruption of the ore body in the Churchrock mining area increased the concentration of dissolved radium in water pumped from the mines from 0.05 - 0.62 pCi/l to over 8 pCi/l. According to company data, the concentration rose to over 75 pCi/l, or at least 75 times the natural concentration, in the two-year period during which the mine was being developed. The pattern of increasing radium with time, seen in Ambrosia Lake, is being repeated. Ground-water inflow via long holes

in the Kerr-McGee Section 36 mine contains a relatively low concentration of dissolved radium-226. Therefore, much of the radium loading of mine effluent is apparently a result of leaching of ore solids remaining from mucking and transport within the mine. In some cases this could be reduced by improved mining practices, such as provision of drainage channels along haulage drifts.

8. Company data show that seepage from the Anaconda tailings pond at Bluewater averages 183 million liters/year (48.3 million gallons) for 1973 and 1974. The average volume injected for the same time period was 348 million liters/year (91.9 million gallons). Therefore, approximately one-third of the total effluent volume remaining after evaporation (531 million liters/year) enters the shallow aquifer which is a source of potable and irrigation water in Bluewater Valley. From 1960 through 1974, seepage alone introduced 0.41 curies of radium to the shallow potable aquifer. Adequate monitoring of the movement of the seepage and the injected wastes is not underway.

9. There are indications that waste injected into the Yeso Formation by the Anaconda Company are not confined to that unit as originally intended in 1960. Three nearby monitoring wells, completed in the overlying San Andres Limestone and/or the Glorieta Sandstone, show a trend of increasing chloride and uranium with time. Positive correlations of water quality fluctuations with the volumes of waste injected are a further indication of upward movement. The absence of monitoring wells in the injection zone is a major deficiency in the data collection program.

10. The maximum concentration of radium observed in shallow ground water adjacent to the Kerr-McGee mill at Ambrosia Lake was 6.6 pCi/1. According to company data, seepage from the tailings ponds occurs at the rate of 491 million liters/year (130 million gallons/year). This is 29 percent of the influent to the "evaporation ponds" and attests to their poor performance in this regard. Radium and gross alpha in the seepage are 56 pCi/1 and 112,000-144,000 pCi/1, respectively. Total radium introduced to the ground water to date is estimated at 0.7 curies. Wells completed in bedrock and in alluvium, and located near watercourses containing mine drainage and seepage from tailings ponds, contain elevated levels of TDS, ammonia, and nitrate. One well, which contained 1.0 pCi/1 in 1962, now is contaminated with 3.7 pCi/1 of radium. Sorption or bio-uptake of radium is pronounced; hence, concentrations now in ground water are not representative of ultimate concentrations.

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11. Water-quality data from 11 wells over a 200-square kilometer area in the Puerco River and South Fork Puerco River drainage basins reveal essentially no noticeable increase in concentrations of radionuclides or common inorganic and trace constituents in ground water as a result of mine drainage. Natural variations in the uranium content of sediments probably account for differences in radium content in shallow wells. Dissolved radium in shallow ground water underlying stream courses affected by waste water is essentially unchanged from that in areas unaffected by mine drainage. None of the samples contained more than recommended maximum concentrations for radium-226, natural uranium, thorium-230, thorium-232, or polonium-210 in drinking water. However, the paucity of sampling points and the absence of historical data make the foregoing conclusion a conditional one, particularly in the reaches of the Puerco River within approximately 10 kilometers downstream of the mines.

12. Four wells sampled in the vicinity of the Jackpile mine near Paguate contained 0.31 to 3.7 pCi/l radium-226. With the exception of the latter value from the new shop well in the mine area, remaining supplies contain 1.7 pCi/l or less radium. The Paguate municipal supply contains 0.18 pCi/l. None of the wells were above maximum permissible concentrations (MPC) for the other common isotopes of uranium, thorium, and polonium. Ground water from the Jackpile Sandstone may contain elevated levels of radium as a result of mining activities. Mine drainage water ponded within the pit contained 190 pCi/l radium and 170 pCi/l of uranium in 1970. The impacts of mining on ground-water quality downgradient from the mining area are unknown due to the lack of properly located monitoring wells. No adverse impacts from mining on the present water supply source for Paguate are expected.

13. Of the 71 ground-water samples collected for this study, a total of 6 had radium-226 in excess of the 3 pCi/l PHS Drinking Water Standard. Two of the 6 involved potable water supplies. One containing 3.6 pCi/l serves a single family and is located adjacent to Arroyo del Puerto and downgradient from the mines and mills in Ambrosia Lake. The second contains 3.7 pCi/l and is used as a potable supply for the labor force in the new shop at the Jackpile Mine.

14. The highest isotopic uranium and thorium, and polonium-210 contents for any potable ground-water supplies sampled in the study area are less than 1.72% of the total radionuclide population guide - MPC as established in NMEIA regulations.

15. The lowest observed concentration (background levels) in ground water are summarized as follows:

Radionuclides	Range (pCi/l)	Average (pCi/l)
Radium-226	0.06 - 0.31	0.16
Polonium-210	0.27 - 0.57	0.36
Thorium-230	0.013- 0.051	0.028
Thorium-232	0.010- 0.024	0.015
U-Natural	14 - 68	35

16. The uranium isotopes (uranium 234, 235 and 238) are the main contributors to the gross alpha result; however, in several determinations, gross alpha underestimated the activity present from natural uranium.

17. No correlation was found between gross alpha content of 15 pCi/l (including uranium isotopes) and a radium-226 content of 5 pCi/l.

18. It is doubtful that the gross alpha determination can even be used as an indicator of the presence of other alpha emitters (e.g., U-natural and polonium-210). Furthermore, since the gross alpha results have such large error terms, no meaningful determination of percentage of radionuclides to gross alpha can be implied.

19. Gross alpha determinations also failed to indicate the possible presence of lead-210 (primarily a beta emitter) which, because of the lower MPC of 33 pCi/l, may be a significant contributor to the radiological health hazard evaluation of any potable water supply.

20. Radium-226 in ground water is a good radiochemical indicator of wastewater contamination from mines and mills. Due to the low maximum permissible concentration, it also provides a good means for evaluating health effects. Selenium and nitrate also indicated the presence of mill effluents in ground water. Polonium-210, thorium-230 and thorium-232 concentrations in ground water fluctuate about background levels and are poor indicators of ground-water contamination from uranium mining and milling activities.

21. For routine radiological monitoring of potable ground-water supplies, isotopic uranium and thorium and polonium-210 analyses do not appear to be necessary due to their high maximum permissible concentrations (chemical toxicity of uranium may be a significant limiting factor, however).

TASK II: Evaluate the Adequacy of Company Water Quality Monitoring Networks, Self-Monitoring Data, Analytical Procedures, and Reporting Requirements.

1. Company sponsored ground-water monitoring programs range from inadequate to nonexistent. Actual monitoring networks are deficient in that sampling points are usually poorly located or of inadequate depth/location relative to the hydrogeologic system and the introduction of contaminants thereto. Compared to the multi-million dollar uranium industry, producing multi-billion liters of toxic effluents, the ground-water sampling and monitoring programs represent minimal efforts in terms of network design, implementation, and level of investment.

2. Company radiochemical analytical methods are inadequate for measuring environmental levels of radionuclides and have high minimum detectable activities and large error terms. Incomplete analysis of radionuclide contents prevails. Few data are reported on other naturally occurring radionuclides such as isotopic thorium, polonium-210, and radium-228. In some cases, monitoring has been restricted to analysis of radium-226 and natural uranium, without consideration of these other radionuclides or toxic metals.

3. Monitoring of hydraulic and water-quality impacts associated with conventional mining and with solution (in situ) mining is not reported to regulatory agencies. It is likely that such monitoring is limited to meeting short-term economic and engineering needs of the companies rather than addressing long-term, general environmental concerns. As a result, overall impacts on ground water are not routinely determined and reported.

4. Off-site ground-water sampling networks do not utilize wells specifically located and constructed for monitoring purposes. Reliance on wells already in existence and utilized for domestic or livestock use falls short of the overall monitoring objectives (i.e., to determine impacts on ground water and to adjust company operations to acceptable levels). Deficiencies of this type can allow contamination to proceed unnoticed. On-site wells constructed specifically for monitoring are generally not completed to provide representative hydraulic and water quality data for the aquifer most likely to be affected.

5. Proven geophysical and geohydrologic techniques to formulate environmental monitoring networks are apparently not used. Such techniques can assist in specifying sampling

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frequencies and provide the basis for adjustment of monitoring and operational practices to mitigate adverse impacts on ground water.

6. Monitoring the effects of the Jackpile and Paguate open pit mines on ground-water quality is nonexistent despite the magnitude of these operations. Drainage water within the pits has contained as much as 190 pCi/l of radium. Two wells, used for potable supply and completed in the ore body, contain elevated levels of radium, further indicating a need for data to determine what the future impacts might be when mining ceases and before additional programs for heap leaching and in situ mining are implemented.

7. Careful analysis of material and water balances to determine seepage input to ground water for the various tailings disposal operations is not evident. For the Ananconda Company, the method utilized has not been altered in 14 years. For Kerr-McGee, overland flow presents a potential threat to the structural integrity of the retention dams. At the United Nuclear-Homestake Partners Mill, no quantitative estimates of seepage are available.

8. Records of U. S. Atomic Energy Commission (USAEC) inspection reports, mill license applications, seepage reports, etc., on file with the State appear to be incomplete and disorganized. No interpretive summary or review-type reports utilizing the monitoring data reported by industry are available from either the State or the U.S. Atomic Energy Commission files now held by the State. Liberal mill licensing conditions with respect to ground-water monitoring and water-quality impacts were initially established by the USAEC. Subsequently, there has been essentially no review, in any critical sense, of company operations with respect to ground-water contamination. The uranium mining and milling industry has not been pressed to monitor and protect ground-water resources. The limited efforts put forth by industry to date have largely not been reviewed by regulatory agencies at the State and Federal levels.

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RECOMMENDATIONS

Action Required

1. Improved industry-sponsored monitoring programs should be implemented and the data made available to State and Federal regulatory agencies. Programs should be designed to detect likely hydraulic and water quality impacts from uranium milling and mining (open pit, underground, in situ). Revamped programs, specifically developed by joint concurrence of industry and regulatory agencies, should be incorporated in licenses, where possible. Licenses should specify minimal radiochemical analytical methods for detecting specific radionuclides as well as requirements for participation in quality assurance programs. Specific reporting procedures should include raw data, summary reports, and interpretations of data. Conclusions concerning impacts of operations on ground-water quality and remedial steps taken to abate or eliminate adverse impacts should be prepared. It is essential that the programs developed, as well as the data and interpretive reports prepared therefrom, be critically reviewed by the State to meet continuing regulatory responsibilities.

2. Because seepage from the Anaconda and Kerr-McGee tailings ponds constitutes a significant portion of the inflow to the ponds, it is recommended that seepage control measures be adopted. According to company records, such seepage presently totals some 674 million liters per year. Water budget analyses of the United Nuclear-Homestake Partners tailings pond should be made to determine how much seepage is occurring, and thereby contributing to contamination of the shallow aquifer locally developed for domestic water supplies in two adjacent privately owned housing developments.

3. Improved mining practices should be adopted to reduce the amount of radium leached from ore solids by ground water present in operating mines.

ADDITIONAL STUDIES REQUIRED

1. Studies should be immediately initiated to verify whether the source of ground-water contamination in the Broadview Acres and Murray Acres subdivision is from the nearby uranium mill. An improved monitoring program should be developed to predict contaminant migration and to provide the basis for subsequent enforcement action. Necessary action should be taken to provide potable water for the affected area. Studies should be undertaken to determine the means to prevent continuing contamination.

2. With regard to the Anaconda waste injection program, all available chemical and water level data for pre-injection and post-injection periods should be evaluated to ascertain if waste is migrating out of the Yeso Formation and into overlying aquifers containing potable water. Of particular concern are radium-226 and thorium-230 because of their abundance in the injected fluid. Limited chemical data indicating migration of waste beyond the injection interval necessitate that a thorough re-evaluation be made of the long term adequacy of this method of waste disposal. Construction of additional monitoring wells in the Yeso Formation and the Glorieta-San Andres is in order. Because of low MPC values, this is particularly true if increasing concentrations of radium-226 and possibly lead-210 are appearing in the aquifers above the injection zone. The Anaconda Company should also evaluate the current loss of uranium resources to the subsurface through their current disposal technique.

3. Available chemical data for ground-water samples collected by Kerr-McGee from wells located adjacent to Arroyo del Puerto and San Mateo Creek should be evaluated for long-term trends in water quality. Data for the Wilcoxson (P. Harris), Bingham, Marquez, and County Line Stock Tanks wells are of principal concern.

4. Water-quality data from the newly completed monitoring wells peripheral to the Kerr-McGee mill should be cross-checked using non-industry laboratories to determine the extent of contamination in the Dakota Sandstone.

5. The breadth of mining and milling activities in the Grants Mineral Belt clearly requires additional study if ground-water impacts are to be understood in any detailed or quantitative sense. The present study provides a preliminary assessment of but a small facet of the overall

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activity in the district. Further study is recommended to determine impacts of past operations or expected impacts from mines and mills now in the planning or construction stages. Site specific investigations are necessary to determine the hydraulic and water quality responses to dewatering and solution mining.

6. Additional ground-water samples should be collected from wells adjacent to the Rio Puerco and east of Gallup to determine if radium concentrations are acceptably low and to establish baseline conditions for future reference. It is recommended that concentrations of trace metals should also be measured.

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AREAL DESCRIPTION

Location and Description of Study Area

The Grants Mineral Belt, located in the southeastern part of McKinley County and the north-central portion of Valencia County, is a rectangular shaped area in northwestern New Mexico (John and West, 1963). It is 24 to 32 kilometers wide in the north-south direction and 137 to 177 kilometers long from east to west (see Figure 1) (Kelley, 1963; Kittel, Kelley, and Melancon, 1967).

At present, three mining districts dominate the Mineral Belt. These are Churchrock on the west, Grants-Ambrosia Lake in the center, and Paguate-Jackpile on the east. These contain the Gallup, Churchrock, Smith Lake, Ambrosia Lake, Grants, North Laguna, and South Laguna mining areas. The districts are physiographically separated, Laguna lying to the east and Grants and Gallup to the west (Kelley, 1963; Kittel, Kelley, and Melancon, 1967).

The Continental Divide, extending through approximately the middle of the area, separates the region into two areas of drainage. West of the Divide, streams and rivers drain into the Gulf of California via the Colorado River system, while to the east they eventually join the Rio Grande (Dutton, 1885). Nearly all the streams in the area are intermittent and flow only during periods of intense precipitation (Cooper and John, 1968; Gordon, 1961).

The Grants Mineral Belt of northwestern New Mexico is within the Navajo and Datil sections of the Colorado Plateau physiographic province (Fenneman, 1931). To the east are the Southern Rocky Mountains and to the west and south, the Basin and Range province. To the north lie the Central Rocky Mountains.

Characteristic landforms within the study area include rugged mountains, broad, flat valleys, mesas, cuestas, rock terraces, steep escarpments, canyons, lava flows, volcanic cones, buttes, and arroyos (Kittel, Kelley, and Melancon, 1967; Cooper and John, 1968). Lava flows and volcanic necks are the predominant landmarks of the Datil section (Fenneman, 1931).

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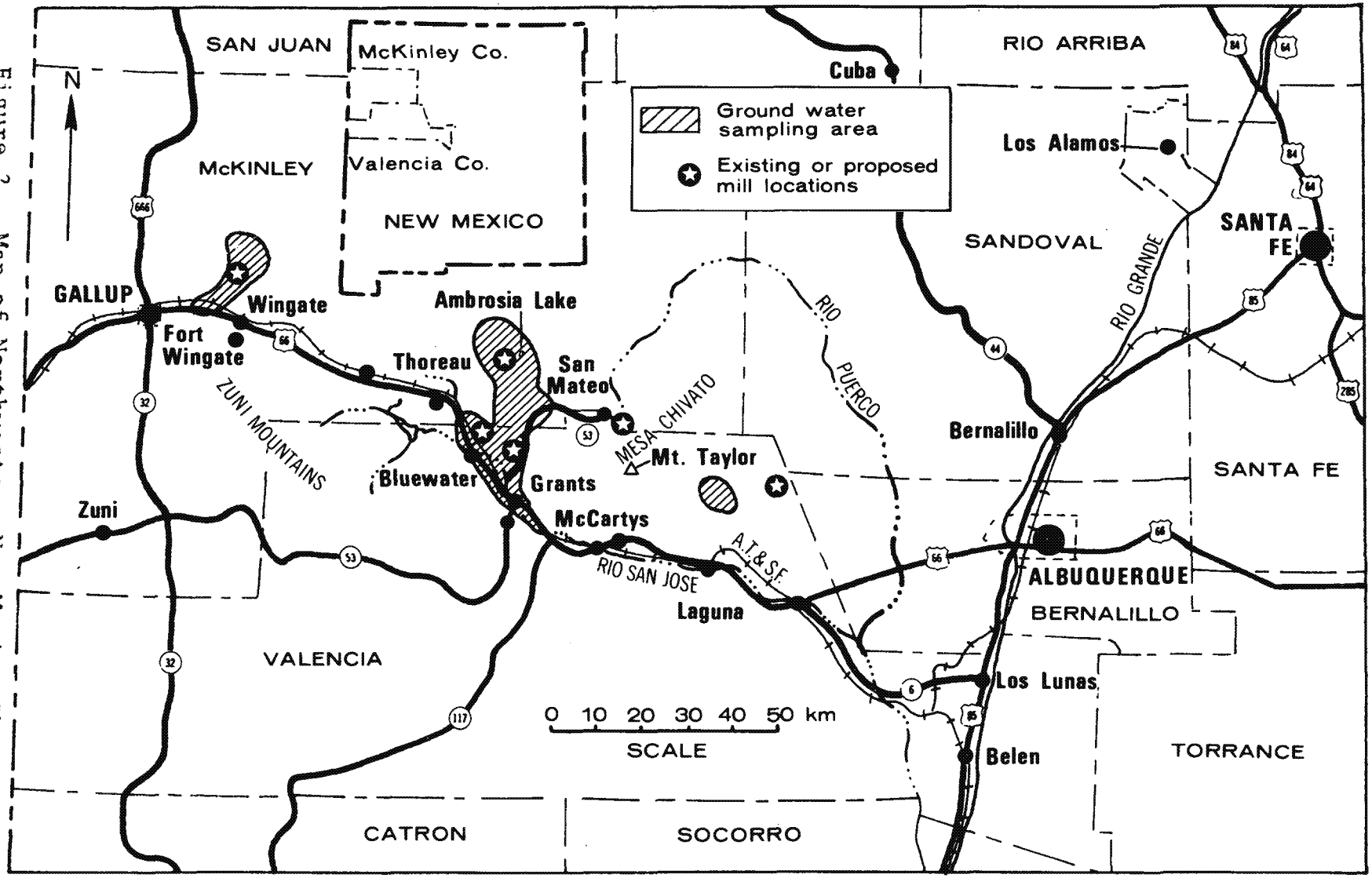

Figure 2. Map of Northwestern New Mexico Showing General Location of Sampling Areas in the Grants Mineral Belt

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Prior to uranium mining and the discharge of mine and mill effluents, there were no perennial streams in southeastern McKinley County. In this period, the arroyos and wash channels and other natural depressions such as Ambrosia Lake, Casamero Lake and Smith Lake contained water only after heavy rains. There are intermittent ponds and lakes in the volcanic craters of the Cebolleta Mountains. The only perennial source of water is part of Bluewater Lake at the junction of Azul and Bluewater Creeks (Cooper and John, 1968).

Principal Industries

Until relatively recently, the principal industries in McKinley and Valencia Counties of northwestern New Mexico were farming and ranching. Tourism and small-scale logging were secondary. The land is mostly used for livestock grazing, while some irrigated farming is done in the valleys of Bluewater Creek and the Rio San Jose. The main crops are vegetables, and plants exist in the area for processing and packaging them.

Now that uranium ore has been found to be widespread throughout the Grants Mineral Belt, the uranium mining and milling industry predominates. What was a rural agricultural economy has partly become an industrial one. The figures on Table 1 indicate the importance of the uranium industry in the economy of New Mexico, especially the northwest part. The growth of the uranium industry has created a need for associated industries and services, especially the chemical industry. Caustic soda and soda ash are the main alkalies used in uranium milling. The construction and housing industries have flourished, and mining supply firms and concrete companies have been established (Gordon, 1961).

Gallup and Grants have grown rapidly, as have some of the smaller villages and communities. The population of McKinley County has grown from 27,451 in 1950 to 43,208 in 1970, and that of Valencia from 22,481 to 40,539 (University of New Mexico, Bureau of Business Research, 1972).

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Table 1

Uranium Economy of New Mexico

Year	Production (tons or metric tons)	Value	Reserve	Percent of U. S. Total Reserve
1956	1,105,000 tons	$ 24,086,000	41 million tons	66 2/3%
1959	3,269,826 tons	$ 53,463,000	55 million tons	63%
Year ending June 30, 1962		McKinley Co. only $ 57,431,391		
1970	11,574,000 tons	$ 69,970,000		
1974	7,527 metric tons U_3O_8	$102,060,000		42%

1974 Production Capacity of Uranium Mills in New Mexico

Company	Plant Location	Nominal Capacity Tons Ore Per Day
The Anaconda Co.	Grants, New Mexico	3,000
Kerr-McGee Nuclear Corp.	Grants, New Mexico	7,000
United Nuclear-Homestake Partners	Grants, New Mexico	3,500
	Total	13,500
	Total U.S.	28,550
	Percentage in N.M.	47%

References: Midwest Research Institute (1975)
Health & Social Services, State of New Mexico (1975)
WASH 1174-74, The Nuclear Industry, USAEC (1974)

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GEOLOGY AND HYDROLOGY

The principal bedrock and alluvial stratigraphic units in the Grants Mineral Belt range in age from Pennsylvanian to Recent (Hilpert, 1963). Figure 2, which is a generalized geologic cross section through the Grants and Ambrosia Lake areas, portrays these units and the dominant structural feature which is the Chaco slope developed on the north flank of the Zuni uplift. Conditions in the Churchrock area are essentially the same.

Pronounced topographic expression of the gently sloping bedrock units is abundantly evident in the Grants Mineral Belt. The sandstone strata on the mesas, actually gently dipping cuestas, form protective caps which resist weathering. The concave slopes and bottom lands form on less resistant units, typically shales and thin-bedded sandstones interbedded with shale. Although geographically less extensive, lava beds and limestone strata also function as caprocks.

Due to the scarcity of perennial surface water bodies, ground water is the principal source of water in the study area. Industrial, municipal, stock, and private domestic wells tap both bedrock and alluvial aquifers. In general, wells of low to moderate productivity are possible in the unconsolidated valley fill which constitutes an aquifer, primarily along the broad valleys of the Rio San Jose and the Rio Puerco. Numerous shallow domestic wells south and southwest of the United Nuclear-Homestake Partners mill also tap the shallow, unconfined aquifer. Part of the water supply for Gallup, and essentially all of that for Milan and Grants, is derived from shallow wells tapping valley fill and interbedded basalt layers (Dinwiddie et al., 1966).

Process water for the various uranium mills is derived from deep wells tapping bedrock aquifers. This is true for the Anaconda Company and United Nuclear-Homestake Partners mills, both of which tap the San Andres Limestone. Part of the feed water for the Kerr-McGee mill is from wells in the Morrison Formation and the more deeply buried Glorieta Sandstone and San Andres Limestone, with the balance coming from treated mine drainage water. Without exception, the operating mines continuously pump ground water as part of the mining operation. Where economical concentrations of uranium

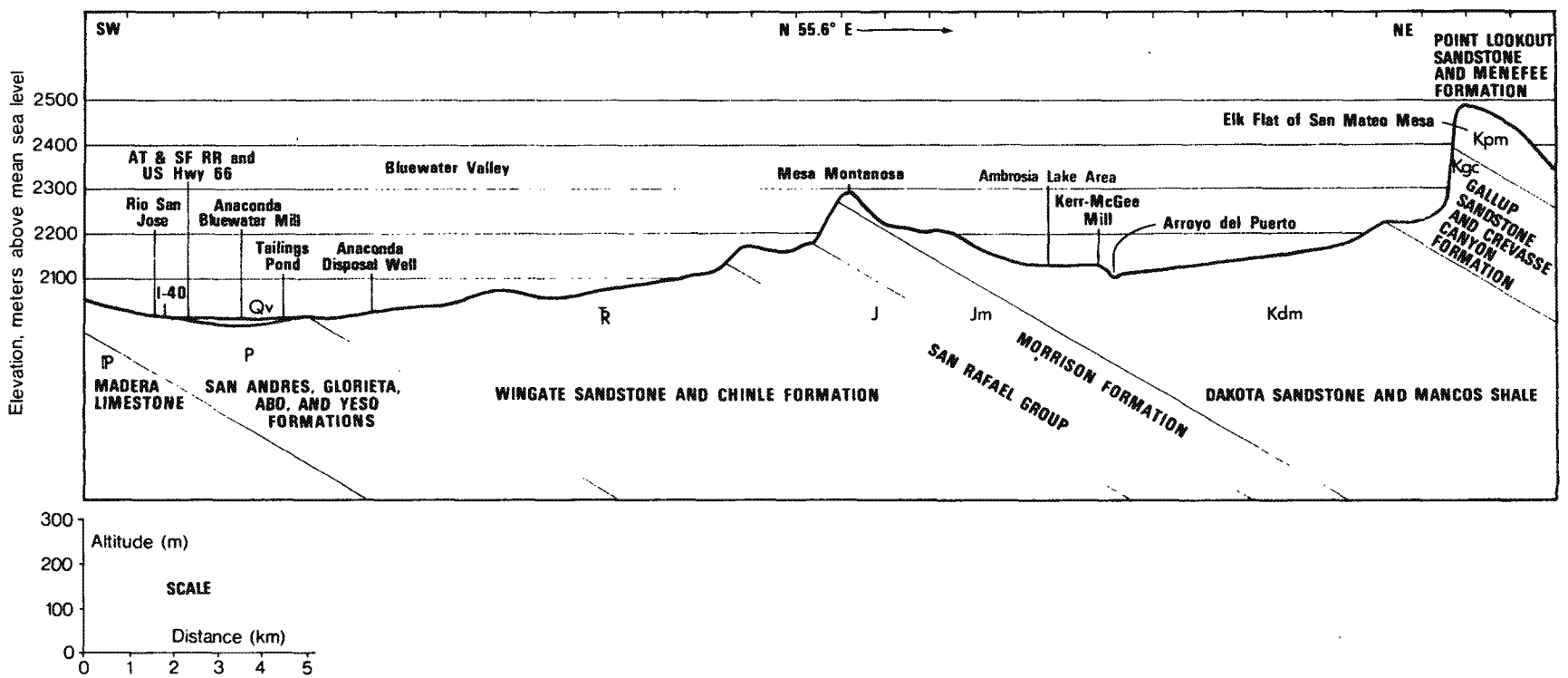

Figure 2. Generalized Structure Section from Bluewater to Ambrosia Lake

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are present, ion exchange plants are operated to effect recovery from the waste streams, but radium removal is not practiced. In effect, the various mines are high capacity wells which locally dewater the ore-bearing formations, chief of which is the Westwater Canyon Member of the Morrison Formation. To a lesser extent, the overlying strata such as the Dakota Formation are also affected by dewatering.

The impacts of ground-water pumping and discharge to surface water courses are varied. Declining water levels in the aquifers tapped, and possibly in the adjacent formations, are immediately noticeable. For example, in the Churchrock area, the static water level in the old Churchrock mine is declining about 0.3 meter per month due to dewatering at the United Nuclear and Kerr-McGee mines. Discharge of the mine water has transformed nearby dry washes and ephemeral streams into perennial ones. Rio Puerco, Arroyo del Puerto, and San Mateo Creek are cases in point. Water introduced to these channels will persist until the losses due to bed infiltration, evapotranspiration, and diversion equal inflow. Infiltration of such waters to shallow alluvial aquifers may be adverse, depending on the quality of infiltrating water relative to ambient water quality in the aquifer and the use to which shallow ground water is or will be put. The combination of declining water levels in the deeper, bedrock aquifers and deteriorated water quality in the shallow aquifers may have particularly adverse impacts on stock wells also used by the local populace for potable supply.

Sorption of radionuclides, such as radium on the stream sediments, may result in a buildup of material that will later be dispersed by channel scouring associated with flash flooding. Both the gradual buildup of radium in the sediments and its subsequent redistribution will result in increased levels of radioactivity in the environment as compared to ambient, pre-mining conditions.

Uranium mining and milling in the study area are of particular importance to several aquifers in the study area. Wastes from the Anaconda Company mill in Bluewater have infiltrated via the tailings pile and affected the shallow, unconfined aquifer (Tsivoglou and O'Connell, 1962). Injection of wastes into the deeply buried Abo and Yeso Formations has increased radioactivity and salinity levels therein. Strictly speaking, these are considered aquifers despite the mineralized water naturally present. Should the contamination

move upward into potable aquifers and extend too far laterally, injection would likely be terminated. Widespread contamination of the shallow aquifer adjacent to the tailings pond would similarly require abatement.

The Chinle Formation is a source of domestic water in the Murray Acres and Broadview Acres subdivisions downgradient from the United Nuclear-Homestake Partners mill. As will be shown below, the shallow alluvial aquifer in this area is already believed to be contaminated by the infiltration of effluents from the mill.

In the Ambrosia Lake area, contamination of shallow ground water is likely to be a result of infiltration of 1) effluents from the tailings ponds at the Kerr-McGee mill, 2) mine drainage water that is introduced to settling lagoons and natural water courses, and 3) discharges from ion exchange plants. Seepage from the now inactive United Nuclear, Inc., (formerly Phillips) mill tailings pile is also undoubtedly present in the shallow subsurface. The ultimate impact of these waste waters on ground-water quality is unknown. It is unlikely that seepage returns to the deep, bedrock aquifers will occur because of their relatively great depth and the presence of numerous impermeable layers between the shallow alluvial materials and the principal aquifer (Westwater Canyon Member). A possible exception to this occurs in the vicinity of the Kerr-McGee Section 36 mine where drainage enters a nearby holding pond and seeps out the bottom at a rate of about 400 liters/minute. Seepage may move along the underlying San Mateo fault and enter potable aquifers. Very limited volumes of water in the shallow alluvium render it an insignificant source of supply. What water is present near the mining and milling areas is now likely to be contaminated to varying degrees by industrial effluents. The long-term infiltration of radium-laden water along the stream channel of San Mateo Creek, both above and below the confluence with Arroyo del Puerto, may adversely affect the quality of shallow ground water now developed for stock watering.

The potential for future problems of water availability for ore processing in Ambrosia Lake has been cited by Cooper and John (1968). In essence, dewatering of the principal aquifer (Westwater Canyon Member of the Morrison Formation) to facilitate mining may necessitate use of the poorer quality water in the underlying Bluff Sandstone.

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Hydrogeologic conditions in the vicinity of the Churchrock mines basically resemble those in Ambrosia Lake with respect to potential impacts of mining and milling on ground water. The potential for contamination of shallow groundwater resources is greatest along the channel of the Rio Puerco. Under natural conditions, shallow ground water was scarce or nonexistent; hence, deeper wells completed in bedrock are required for a reliable supply. With continued infiltration of mine drainage water, at least local saturation of the alluvium may occur and lead to ground water development using shallow wells. However, the radium content of the drainage water discharged to date is excessive for potable or stock use of such water, and long term recharge with mine drainage water is not recommended. The potential for contamination of municipal wells along the Rio Puerco, particularly on the east and west fringes of Gallup, is unlikely.

INDUSTRY-SPONSORED WATER QUALITY MONITORING PROGRAMS

Introduction

A principal goal of the project was to evaluate the nature and extent of water monitoring programs, and data therefrom, as implemented by industry. This presumed that descriptions of the sampling points, analytical procedures, and resulting data would be available for examination upon request to the companies. With the exception of the Anaconda Company, this was not the case.

The inadequacies of industry-supported testing and monitoring programs noted by Clark (1974) include lack of sufficient data, intermittent data, and unreliable data.... conclusions, which are at least not contradicted by the present study.

The most extensive monitoring and testing programs to detect ground-water contamination are conducted by Kerr-McGee and Anaconda. By comparison, United Nuclear and United Nuclear-Homestake Partners have minimal programs both at the mines and at the mills. Therefore, the Kerr-McGee and Anaconda programs, although in need of revision, are a marked improvement compared to inactivity.

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Of greatest environmental concern is the discharge of waste water originating from mining and from ore processing. Included in the latter is the discharge stream or tailings from conventional acid and alkaline leach mills and from ion-exchange plants. A third problem area, concerning impacts on ground-water quality from solution mining in the Ambrosia Lake area, is essentially unknown outside the industries involved.

Identification of industrial ground-water monitoring programs, if any, to determine hydraulic and water quality responses to both shaft and solution mining was beyond the scope of the present project. It is expected that solution mining and the use of IX plants, with and without recycling, will gain in popularity, particularly if stricter discharge limits for uranium induce greater capital investment in IX equipment. For this reason, and also because of the heavy ground-water extraction associated with deep mining, deliberate monitoring programs should be implemented and the data made publicly available to detect likely hydraulic and water quality responses.

Adequacy of Water Quality Data and Monitoring Programs

Evaluating the adequacy of a ground-water monitoring program is rather subjective and rarely will there be unanimity of opinion. The diversity of mining activities and geologic or hydrologic settings necessitates great variety in program design. Outlooks and goals of diverse groups also play a large role.

On the basis of the information utilized, the principal deficiencies with ongoing programs can be classified under the following headings:

1. Ground-water monitoring
2. Analytical techniques and reporting procedures
3. Regulatory agency review

Existing ground-water sampling networks range from non-existent to defective. The non-existent networks involve entire operations, as in the case of the United Nuclear Corporation, or portions of operations, as in the case of the solution mining conducted by United Nuclear-Homestake Partners.

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The latter's monitoring of a single well at the mill site to determine shallow ground-water contamination is considered grossly deficient. In essentially every instance of mining and milling, baseline ground-water conditions were not defined. Therefore, any changes due to disruption of natural conditions cannot be assessed. In the case of the Anaconda waste management program, for example, there is no information concerning pre-disposal concentrations of stable and radioactive chemical species in overlying potable reservoirs already affected by the wastewater.

Of the active ground-water monitoring programs that were reviewed, great reliance is placed on documenting the quality of water in active wells within the surrounding region. This is laudable with respect to current water use, but not especially productive in terms of defining water quality impacts. In many instances, sampling wells are located hydraulically upgradient or are so far removed from the likely effects of mining or milling as to show no change. Wells of excessive depth, i.e., below the aquifer likely to show change, are also of dubious value as monitoring points. With the exception of a portion of the Kerr-McGee on-site net, wells specifically constructed for monitoring are commonly too few in number and improperly situated with respect to depth and (or) location. Compared to the multi-million dollar uranium industry, producing multi-billion liters of toxic effluents, the ground-water sampling and monitoring programs represent minimal efforts in terms of network design, implementation, and level of investment. There are indications that deterioration in water quality is occurring through time and very possibly in response to the waste volumes disposed of in the last 15 years. With regard to this disposal scheme, there is real question as to whether the data that have been generated have been scrutinized. In other instances, expected adverse impacts of seepage on shallow ground water have not been found because they have either not been sought or have been sought in unlikely locations.

No response to the requests for information regarding analytical methods and reported results was received from three of the four companies contacted. A review of the available records by the authors at the New Mexico Environmental Improvement Agency indicates many deficiencies in the company programs. These deficiencies include lack of information concerning minimum detectable activities for analytical procedures utilized, overly large error terms,

poor agreement with outside laboratories, absence of quality assurance programs, inability to detect radionuclides at truly environmental or background levels, and irregular or random sampling frequencies. Analysis for specific radionuclides such as isotopic thorium, lead-210, polonium-210, radium-228, all of which are associated with mining and milling effluents, is rarely done. With the exception of the Anaconda Company, results of monitoring programs to determine background levels of both radionuclides or chemical components are not discussed in any of the reports of the companies. From the data/reports reviewed, it is doubtful that the various company laboratories have the analytical capabilities to accurately analyze for environmental levels of the common radionuclides associated with uranium mining and milling.

During February 11 and 12, 1975, a brief review of available company records, USAEC inspection reports, and mill licenses in the possession of NMEIA was conducted. The following findings are preliminary, as not all of the company records were available at the time of the review:

1. The available records are disorganized and incomplete. A complete copy of each company's radioactive material license and supporting correspondence could not be found. Radiological monitoring data reports were often missing or incomplete. Attachments and maps referred to in correspondence in the records could not be found.

2. Except for the license condition requiring monitoring data related to the Anaconda waste injection program, USAEC licenses for the other uranium mills have never specifically required the establishment of ground-water monitoring networks or reporting of any data pertaining to such monitoring. (Some limited programs have, however, been described in company license applications.)

3. It appears that no effort has been made to review or to summarize the reported monitoring data. No interpretive or summary reports concerning environmental impact have been prepared.

4. Almost no information has been reported by the companies describing their radiochemical analytical procedures, quality assurance programs, or the accuracy and precision of reported results.

5. Review by State and Federal regulatory agencies of reports of company efforts to evaluate the fate of liquid tailings waste effluents (e.g., materials and water balances between input versus evaporation, spillage, or ground seepage and total pond capacity) are essentially non-existent.

Noted deficiencies at the Federal level stem largely from the rather liberal, initial licensing conditions (with respect to ground-water monitoring), perfunctory inspection of company monitoring programs and data, and, in general, the somewhat haphazard manner in which information was filed and cataloged for later reference. Simply put, the uranium mining and milling industry has not been overly pressed to monitor and protect ground-water resources, and what efforts they have put forth have largely not been reviewed.

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GROUND-WATER QUALITY IMPACTS

Introduction

The breadth of mining and milling operations in the study area clearly requires additional study if ground-water impacts are to be understood in any detailed or quantitative sense. The following discussion must necessarily be regarded as a preliminary assessment of but a small facet of the overall mining and milling activity. Impacts of inactive operations, such as the Phillips mill, or future impacts from sources under development, such as the Gulf mine and mill in San Mateo or the nearby Johnny M mine, are not addressed herein. Very large voids in our knowledge of impacts on water sources include solution mining practices and dewatering of ore bodies. Essentially no data or interpretive reports are available outside industry circles that describe the hydraulic and water quality impacts of these operations, which may well have the greatest impact of all on ground water.

Contaminated and background concentrations of selected radionuclides, as well as gross and trace chemical constituents, were determined for 71 wells in the study area. These data are presented in Tables 2 through 5. In certain locations, these data relate to surface water phenomena such as natural streams or to manmade features, foremost of which are tailings disposal ponds or streams originating as mine discharge.

The data are discussed by study area and by uranium mining/milling activities therein.

Table 5 summarizes ground-water data from the present study and categorizes the data according to study area and aquifer. These reported values are the lowest concentrations reported for samples collected during the study and may not necessarily represent "true" background or ambient values that may have existed prior to uranium mining and milling activities in this area. For the most part, the values shown for bedrock aquifers are not from the principal ore-producing formations, namely the Westwater Canyon Member of the Morrison Formation. In the Grants-Bluewater area, "bedrock" refers primarily to the San Andres Limestone, whereas near the United Nuclear-Homestake Partners mill, the term includes the San Andres Limestone and the Chinle Formation. At Ambrosia Lake, the Westwater Canyon Member and the Bluff Wingate Sandstones were sampled, whereas

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Table 2
Sampling Point Locations and Gross Chemical Data for
Ground-water Samples from the Grants Mineral Belt, New Mexico

NUMBER	DESCRIPTION	T	R	S	Q	LOCATION LAT.	LONG.	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DATE MEAS.	SAMPLE POINT TYPE[1]	DATE SAMPLED[2]	WATER USE[3]	TEMP. °C	pH	SP. COND. umhos/cm	CONCENTRATION, mg/l TDS	CL	NH_3	NO_2 +NO_3 as N
Paguate-Jackpile																				
9230	Well #4 (Anaconda Co.)	11	5	27	421	350909	1072054	210.	34.9	2/75	3	2/28	PI	17.4	8.8	1100	540.	<0.2	0.05	0.05
9231	Well P-10 (Anaconda Co.)	10	5	4	413	350716	1072214	--	61.6	2/75	3	2/28	PI	36.1	8.3	2500	1200.	0.5	0.08	0.04
9232	New Shop Well (Anac. Co.)	10	5	9	224	350653	1072152	184.	--	--	3	2/28	PI	13.6	8.1	2500	1400.	0.5	0.14	0.05
9233	Paguate Municipal Well	11	5	32	241	350828	1072302	22.9	Art.	2/75	3	2/28	M	15.2	7.5	675	340.	6.6	0.08	0.20
Grants-Bluewater																				
9021	Injection Well (Anac.Co.)	12	10	8	314	351649	1075519	547.4	72.2	4/59	9	2/28	W					65.	69.0	32.8
9101	Mt. Taylor Mill Works Old Rt. 66	11	10	5	442	351224	1075422	58.5	--	--	1	2/24	PI	12.	6.25	1050	780.	25.	0.04	4.2
9103	C. Connerly	11	10	9	221	351212	1075331	37.2	24.4	2/75	3	2/25	P	12.	7.4	1200	880.	33.	<0.01	6.2
9111	C&E Concrete	11	10	22	341	350950	1075257	36.6	24.4	2/75	3	2/26	PI	14.	7.6	775	560.	30.	0.05	3.4
9112	Grants City Hall, Municipal water supply	11	10	26	244	350914	1075117	N/A	N/A	--	1	2/26	M	11.	7.3	1000	730.	32.	0.02	0.47
9115	Auro's Bar & Motel, Cowell House	12	11	24	334	351449	1075718	45.7	--	--	1	2/26	P	14.	7.1	1425	1100.	6.2	0.02	3.9
9116	Milan Well #1	11	10	21	221	351029	1075333	45.7	16.5	10/47	3	2/26	M	17.	7.5	700	500.	14.	0.02	1.6
9117	Monitor Well (Anac. Co.)	12	10	8	332	351650	1075518	191.4	58.3	3/60	1	2/27	O	20.	6.8	2900	2300.	11.	0.03	1.5
9118	Well #2 (Anac. Co.)	12	11	24	234	351527	1075648	118.	91.2	5/72	3	2/27	IP	18.5	7.1	2550	1900.	270.	0.64	39.9
9119	Well #4 (Anac. Co.)	12	11	25	214	351436	1075650	69.	42.1	5/72	3	2/27	IP	17.	7.2	1225	890.	42.	0.13	5.7
9120	Mexican Camp	12	10	30	112	351443	1075617	85.3	43.6	2/47	3	2/27	O	15.	7.5	720	490.	10.	0.04	0.73
9121	Berryhill, Sec. 5 (Anac. Co.)	12	10	5	341	351813	1075512	221.	74.9	1/58	4	2/27	S	20.	7.0	2900	2000.	4.2	0.14	0.05
9122	North Well (Anac. Co.)	12	10	7	143	351731	1075611	76.2	53.9	10/55	4	2/27	O	17.5	7.4	2200	1900.	4.2	0.08	1.3
9123	Engineer's Well	12	11	14	213	351643	1075801	35.1	26.8	2/75	2	2/28	O	11.5	7.3	1625	960.	61.	0.09	3.2
9124	Berryhill House	12	11	11	334	351659	1075823	45.7	37.1	6/56	1	2/28	P	11.	7.5	1800	940.	65.	0.05	0.8
9125	LDS Church-Bluewater	12	11	22	234	351521	1075859	79.2	27.9	12/46	1	2/28	M	5.	7.5	1800	1000.	12.	0.05	0.95
9126	Roundy House Well	12	11	23	231	351532	1075800	91.4	21.2	1/47	1	2/28	P	10.5	7.3	1975	1100.	110.	0.04	6.5
9127	Fred Freas	12	10	30	433	351347	1075552	41.1	--	--	3	2/28	P	13.	7.7	1025	540.	18.	0.03	0.03
9128	Leroy Chapman	12	10	32	211	351338	1075450	41.1	23.	1/47	1	2/28	P	11.	7.6	950	490.	13.	0.03	1.4
9129	Jack Freas	12	10	30	242	351424	1075530	48.8	32.5	2/55	1	2/28	P	11.5	7.5	1325	780.	54.	0.04	2.5

(Continued)

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(continued)

Table 2

Sampling Point Locations and Gross Chemical Data for Ground-water Samples from the Grants Mineral Belt, New Mexico

NUMBER	DESCRIPTION	T	R	S	Q	LOCATION LAT.	LONG.	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DATE MEAS.	SAMPLE POINT TYPE[1]	DATE SAMPLED[2]	WATER USE[3]	TEMP. °C	pH	SP. COND. umhos/cm	TDS	CONCENTRATION, mg/l CL	NH_3	NO_2 +NO_3 as N
United Nuclear-Homestake Partners																				
9102	G. Wilcox	12	10	27	442	351410	1075217	32.6	--	--	3	2/24	P	14.	6.5	2850	2300.	180.	0.01	5.5
9104	T. Simpson	12	10	27	444	351403	1075217	87.5	--		1	2/25	P	10.	8.4	2050	1400.	37.	<0.01	0.08
9105	Schwagerty	12	10	34	224	351351	1075218	77.7	--		1	2/25	P	11.	7.5	1950	1300.	46.	<0.01	1.00
9106	J. Pitman	12	10	35	332	351345	1075214	89.9	--		1	2/25	P	14.	8.8	1725	1300.	39.	<0.01	0.33
9107	C. Worthen	12	10	35	332	351341	1075208	26.2	5.5	2/75	3	2/25	P	14.	7.4	4000	3800.	260.	0.01	62
9108	Pitney	12	10	27	431	351406	1075246	54.9	--	--	6	2/25	P	14.	7.6	2775	2200.	110.	0.01	3.3
9109	T. A. Chapman	12	10	34	121	351352	1075255	38.1	13.1	2/75	6	2/25	P	14.5	7.5	1700	1300.	9.5	0.01	2.5
9113	C. Meador	12	10	35	144	351336	1075150	36.6	--		1	2/26	P	8.	7.8	2025	1600.	120.	0.01	2.9
9114	Bell	12	10	25	133	351427	1075108	152.4	--		1	2/26	P	17.	8.3	1475	970.	34.	<0.01	0.00
9133	G. Enyart	12	10	27	331	351408	1075312	64.0	15.2	3/75	1	3/02	P	18.	7.6	3000	1600.	50.	0.26	0.97
9134	Well #2 (UNHP)	12	10	26	311	351422	1075146	121.9	21.6	5/56	3	3/03	PI	15.	6.95	1600	1600.	0.2	0.03	0.42
9135	Well D (UNHP)	12	10	26	313	351417	1075208	26.8	16.4	3/75	3	3/03	O	12.	7.2	3500	4500.	340.	1.0	2.6
9136	Well #1 (UNHP)	12	10	26	242	351431	1075117	298.7	40.8	5/58	3	3/03	PI	18.	6.9	1850	2000.	<0.2	0.07	0.28
Ambrosia Lake																				
9130	N. Marquez house well	13	9	23	212	352048	1074527	85.3	15.4	3/75	3	3/01	N	16.	8.9	1300	720.	4.8	0.04	0.06
9131	C. Sandoval windmill	13	9	22	212	352043	1074626	39.6	11.3	3/75	3	3/01	S	14.	8.0	1300	660.	27.	0.06	1.2
9132	N. Marquez windmill	13	9	21	414	352022	1074603	44.2	19.5	3/75	5	3/01	N	14.	7.6	4250	2200.	43.	0.22	106.3
9201	KM-46, P. Harris (Wilcoxson)	13	9	16	411	352114	1074738	76.2	--	--	3	2/26	PS	13.	6.7	3250	1900.	23.	0.14	0.09
9202	KM-52, County Lne Stk Tnk	12	10	12	433	351636	1075037	30.5	14.2	11/55	3	2/26	SP	6.5	7.05	2200	2100.	56.	0.06	62
9203	KM-45, Navajo windmill	13	10	8	211	352233	1075508	108.8	--	--	7	2/26	SP	3.1	8.5	620	400.	6.8	0.02	4.0
9204	KM-49, Ingersoll Rand	13	9	22	121	352050	1074655	90.5	--	--	1	2/26	P	6.4	7.45	2150	2200.	36.	0.05	79.7
9205	KM-47, Bingham	13	9	22	121	352053	1074650	79.2	--	--	3	2/26	P	14.2	7.1	3100	2000.	40.	0.04	4.7
9206	KM-63, Marquez	13	9	15	343	352055	1074647	117.3	--	--	3	2/26	P	13.	7.15	2050	1900.	34.	0.05	4.4
9207	KM-S-12	14	9	32	313	352346	1074911	12.5	0.91	2/75	5	2/27	O	11.0	6.5	>8000	14000.	3100.	0.50	0.04
9208	KM-43	14	9	32	321	352355	1074900	16.2	6.4	2/75	5	2/27	O	13.	7.5	7000	7800.	2.8	NS	NS
9209	KM-44	14	9	32	312	352355	1074902	42.1	32.0	2/75	5	2/27	O	14.1	7.1	3100	2700.	17.	0.66	48.7
9210	KM-51	14	9	32	322	352353	1074850	19.2	8.8	2/75	2	2/27	O	11.0	7.0	6000	6300.	44.	0.30	350
9211	KM-48	14	9	30	432	352430	1074939	16.2	11.3	2/75	5	2/27	O	13.	7.0	4200	4100.	31.	0.90	1.3
9212	KM, Seepage return	14	9	31	442	352342	1074919	N/A	N/A	N/A	3	3/03	-	9.	2.2	>>8000	36000.	3100.	590.	53
9213	KM-B-2	14	9	31	421	352354	1074926	8.2	1.04	3/75	5	3/03	O	8.6	5.5	>>8000	8900.	3400.	0.12	0.25

(Continued)

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(continued)
Table 2
Sampling Point Locations and Gross Chemical Data for
Ground-water Samples from the Grants Mineral Belt, New Mexico

NUMBER	DESCRIPTION	LOCATION T R S Q	LOCATION LAT.	LOCATION LONG.	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DATE MEAS.	SAMPLE POINT TYPE[1]	DATE SAMPLED[2]	WATER USE[3]	TEMP. °C	pH	SP. COND. umhos/cm	TDS	CONCENTRATION, mg/l CL	NH_3	NO_2+NO_3 as N
Ambrosia Lake (Continued)																	
9214	KM-36-2	14 10 36 422	352352	1075026	17.4	10.1	3/75	5	3/03	O	12.5	6.85	>8000	9100.	1700.	2.9	8.0
9215	KM-46	14 9 30 331	352430	1075017	11.6	10.1	2/75	2	3/03	O	13.	6.7	3250	3200.	100.	10.	2.0
9216	KM-47	14 9 30 341	352430	1074959	18.9	7.3	2/75	5	3/03	O	14.2	7.1	3100	2600.	74.	0.80	2.6
9217	KM-50	14 9 32 114	352414	1074901	16.6	14.0	2/75	2	3/03	O	11.9	7.7	5750	4700.	470.	9.1	70.9
9218	KM-5-1	13 9 5 214	352316	1074835	10.4	7.3	3/75	5	3/03	O	13.5	6.95	5000	4800.	61.	0.16	0.40
9219	KM-5-2	13 9 5 141	352310	1074856	10.4	6.0	3/75	5	3/03	O	12.5	7.1	>8000	6700.	1300.	0.08	1.3
Gallup-Churchrock																	
9137	Erwin well	16 18 7 433	353730	1084524	610.	221.0	3/75	3	3/05	M	--	7.85	1225	740.	14.	0.09	0.02
9138	Boardman Trailer Park	15 18 14 243	353159	1084237	91.4	45.7	3/75	3	3/05	P	--	7.6	1450	930.	<0.2	0.50	1.2
9139	G. Hassler	15 17 8 133	353242	1084008	91.4	4.6	3/75	1	3/05	P	--	7.75	1400	880.	98.	0.02	119.6
9140	Dixie well	15 17 9 413	353227	1083835	--	1.2	3/75	3	3/05	N	--	7.7	2400	1500.	<0.2	0.30	0.16
9141	Churchrock Village	15 17 12 333	353222	1083553	65.6	--	--	6	3/05	P	--	7.8	1375	720.	0.5	0.50	0.18
9142	White well	16 16 16 422	353701	1083147	--	2.1	3/75	2	3/05	N	--	8.00	1000	620.	630.	0.01	0.02
9220	CRKM-2, Hardground Flats well	Navajo Reservation	353958	1083404	189.6	--	--	4	3/05	SP	--	9.15	1350	850.	0.	0.03	0.28
9221	CRKM-11, E. Puerco River well (=Togay well, 9143)	16 16 15 431	353638	1083059	96.9	--	--	7	3/05	SP	--	7.65	550	340.	14.	0.04	62
9222	CRKM-16, Puerco well	16 17 25 113	353533	1083551	42.7	7.04	3/75	7	3/05	SP	--	7.25	2200	1600.	0.	34.	0.01
9223	CRKM-5, Pipeline Rd well	16 15 33 422	353420	1083810	37.2	10.7	3/75	7	3/05	S	--	7.65	1350	880.	0.	1.4	1.6
9224	CRKM-3, Nose Rock well	16 17 15 131	353709	1083720	207.3	31.4	--	4	3/05	SP	--	8.9	1550	980.	0.	0.07	0.03
9225	CRKM-10, N.E. Pipeline well	Navajo Reservation	354015	1082841	284.1	>91.4	3/75	7	3/05	SP	--	9.05	2650	2300.	8.1	0.12	0.01

Explanation

1 - Sampling Point
- 1-outside faucet
- 2-hand bailed
- 3-pumped (well head)
- 4-windmill
- 5-mobile pump
- 6-kitchen faucet
- 7-holding tank
- 8-wash room
- 9-pre-injection filter discharge

2 - Date Sampled
- 1975

3 - Well Type
- N-not in use
- P-potable
- S-stock
- M-municipal supply
- I-industrial
- O-observation/monitor
- W-waste discharge

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Table 3
Selenium and Vanadium Concentrations
in Selected Ground-water Samples[1]

NUMBER	DESCRIPTION	Se (mg/l)	V (mg/l)
United Nuclear-Homestake Partners			
9102	G. Wilcox	1.06	<0.3
9107	C. Worthen	1.06	0.3
9113	C. Meador	0.20	0.3
9134	Well #2 (UNHP)	<0.01	1.3
9135	Well D (UHNP)	1.52	0.4
Grants Bluewater			
9117	Monitor well (Anaconda)	0.01	0.3
9118	Well #2	0.01	0.8
9119	Well #4	<0.01	0.9
9120	Mexican Camp	<0.01	1.0
9121	Berryhill, Section 5	<0.01	0.8
9123	Engineer's well	0.01	1.1
9129	Jack Freas	0.02	1.3
Ambrosia Lake			
9132	N. Marquez windmill	.13	< .3
9201	KM-46, P. Harris (Wilcoxson)	<0.01	< .3
9207	KM-S-12	<0.01	0.4
9208	KM-43	.29	0.8
9209	KM-44	.01	<0.3
9211	KM-48	<0.1	0.5
9213	KM-B-2	<0.1	0.6
9214	KM-36-2	.02	<0.3
9215	KM-46	<0.01	<0.3
9219	KM-5-2	0.01	<0.3
Gallup-Churchrock			
9138	Boardman Trailer Park	<0.01	<0.3
9140	Dixie well	<0.01	<0.3
9141	Churchrock Village	<0.01	<0.3
9142	White well	<0.01	<0.3
9221	CRKM-11, E. Puerco	0.01	<0.3
9222	CRKM-16, Puerco well	<0.01	<0.3
Paguate-Jackpile			
9230	Well #4	<0.01	<0.3
9232	New Shop well	<0.01	<0.3
9233	Paguate Municipal well	0.01	<0.3

. Analyzed by National Enforcement Investigations Center, Denver, Colorado.

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Table 4

Radiological Data for Selected Ground-water Samples[1]

Grants Mineral Belt, New Mexico

Location Number	Description	Gross Alpha	Ra-226 NEIC	Ra-226 EMSL	U-234	U-235	U-238	U-nat.		Th-230	Th-232	Po-210
Paguate-Jackpile												
9230	Well #4	< 2.0 ± 6	0.31 ± .02	0.23 ±.095						< 0.029	0.012	0.31 ± .11
9231	Well P-10	10 ± 10	1.7 ± .05							< 0.016	< 0.016	0.29 ± .11
9232	New Shop Well	18 ± 13	3.7 ± .08					0.02	14	< 0.016	< 0.011	0.69 ± .20
9233	Paguate Municipal Well	2 ± 4	0.18 ± .02	0.10 ±.072				0.04	47	< 0.018	< 0.010	0.39 ± .18
Grants--Bluewater Area												
9021	Injection Well Anaconda Company	62,500±1,300	53 ±1	27 ±0.95	10,000±750	420 ±67	11,000±770	130	86,000	82000±1200	51 ± 30	3,100±250
9101	Mt. Taylor Mill Works Old Mt. 66	9± 11	0.13± .01									
9103	V. Connerly	7± 10	0.09± .01									
9111	C&E Concrete	7± 9	0.24± .01							<0.028	<0.012	0.55± .15
9112	Grants City Hall	19± 13	0.42± .02	0.10± .098						0.046±.038	0.0094±.021	0.26± .10
9115	Cowell House	7± 12	0.18± .01									
9116	Milan Well No. 1	12± 10	0.14± .01							<0.0072	<0.013	0.30± .12
9117	Monitor Well Anaconda Company	180± 40	2.6 ± .1	2.6 ± .30	100± 7.7	3.0± .58	74± 5.7	0.56	379	<0.016	<0.0097	2.3 ± .90
9118	Well No. 2 Anaconda Company	290± 50	0.50± .02	0.21± .09				1.3	860	0.52±.093	0.54±.094	1.1 ± .37
9119	Well No. 4 Anaconda Company	12± 11	0.20± .01	0.18± .089						<0.039	<0.019	0.26± .19
9120	Mexican Camp	21± 12	0.27± .02							<0.017	<0.0053	0.66± .25
9121	Berryhill Section 5	12± 14	6.3 ± .1							<0.0081	<0.0081	0.28± .17
9122	North Well	30± 17	0.17± .01							0.034±.024	<0.0084	0.51± .17
9123	Engineer's Well	20± 13	0.26± .01	0.36± .11						0.033±.026	<0.016	0.48± .20
9124	Berryhill House	16± 12	0.06± .01									
9125	LDS Church--Bluewater	3± 10	0.22± .01							<0.034	<0.012	<0.070
9126	Roundy House	5± 9	0.11± .01							0.040±.031	<0.015	<0.10
9127	Fred Freas	10± 10	0.21± .01	0.28± .11						<0.034	<0.029	0.39± .14
9128	L. Chapman	11± 11	0.15± .01									
9129	Jack Freas	<1.6± 7	0.14± .01	0.87± .29						<0.018	<0.012	0.31± .16

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(continued)
Table 4

Radiological Data for Selected Ground-water Samples[1]

Grants Mineral Belt, New Mexico

Location Number	Description	Gross Alpha	Ra-226 NEIC	Ra-226 EMSL	U-234	U-235	U-238	U-nat.		Th-230	Th-232	Po-210
United Nuclear - Homestake Partners												
9102-S.	Wilcox	< 3 ± 13	0.19 ± .01	0.22±.091	10 ± .73	0.22± .048	7.7 ± .57	0.07	47	<0.021	<0.012	1.0 ± .95
9104-T.	Simpson	13 ± 14	0.08 ± .01							0.048±.029	<0.021	0.31± .14
9105-	Schwagerty	140 ± 30	0.05 ± .01									
9106-J.	Pitman	12 ± 11	0.05 ± .01	0.19±.087						<0.017	<0.010	0.40± .26
9107-C.	Worthen	2500 ±200	0.72 ± .02	0.78±.17				14	9478	0.99 ±.13	0.034±0.031	1.2 ± .52
9108	Pitney	47 ± 23	0.34 ± .02							0.026±.023	<0.013	0.31± .14
9109-T.	A. Chapman	39 ± 17	0.13 ± .01									
9113-C.	Meador	31 ± 17	0.17 ± .02	<0.072				0.08	54	<0.037	<0.042	2.3 ± .69
9114	Bell	42 ± 18	0.26 ± .01									
9133-S.	Enyart	10 ± 12	0.61 ± .03	0.65±.15	5.1±.41	0.15± .04	3.8 ± .31			0.36 ±.078	<0.016	0.95± .24
9134-	Well #2 UNHP	8 ± 11	0.24 ± .01					0.04	27	0.045±.039	<0.026	0.76± .41
9135-	Well D UNHP	400 ± 70	1.92 ± .04	2.8 ±.31	240±16	9.8 ±1.1	240 ±16	2.6	1760	<0.013	<0.018	2.3 ±2.1
9136-	Well #1 UNHP	22 ± 16	0.27 ± .02									
Acoma Lake												
9130	N. Marquez House	3± 6	0.11 ± .01									
9131	C. Sandoval Windmill	18± 13	0.09 ± .01	0.22 ± .10						0.036±.025	< 0.041	< 0.55
9132	N. Marquez Windmill	< 1.0± 9	0.31 ± .02	0.47 ± .14	81 ± 5.1	2.6 ± .23	74 ±4.7	0.10	68	<0.018	< 0.012	0.79 ±0.43
9201	P. Harris	110± 40	3.6 ± .1					1.0	677	0.03 ±.027	< 0.014	0.52 ±0.16
9202	County Line Stock Tank	86± 31	0.30 ± .02							<0.028	< 0.011	0.22 ±0.10
9203	Navajo Windmill	53± 15	0.07 ± .01									
9204	Ingersoll Ranch	8± 13	0.14 ± .01	0.30 ± .11						<0.018	< 0.011	0.61 ±0.21
9205	Bingham; KM-47	170± 40	0.16 ± .01									
9206	Marquez; KM-65	56± 25	0.60 ± .02									
9207	KM-S-12	410± 120	1.15 ± .03							0.27 ±.060	0.26±.062	< 0.13
9208	KM-43	49± 35	4.0 ± .1	4.7 ± .40						0.021±.013	< 0.014	< 0.[illegible]
9209	KM-44	< 2.0± 10	1.95 ± .04							<0.026	< 0.[illegible]	0.[illegible] ±0.[illegible]
9210	KM-51	45± 29	0.26 ± .02	0.38 ± .12						<0.023	< 0.0[illegible]	0.24 ±0.[illegible]
9211	KM-48	< 3.0± 15	0.20 ± .01							<0.015	< 0.00[illegible]	2.7 ±0.[illegible]
9212	KM-Seepage Return	112,000±3,000	4.9 ± .1	10.[illegible] ± .[illegible]								
9213	KM-S-2	8± 32	6.6 ± .1	6.4 ± .47						<0.01[illegible]	< 0.011	< 0.94
9214	KM-36-2	14± 34	1.18 ± .03	1.5 ± .23	11 ± .78	0.31±.056	6.8 ± .[illegible]			<0.01[illegible]	< 0.014	0.79 ±0.[illegible]

(continued)

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(continued)
Table 4

Radiological Data for Selected Ground-water Samples[1]

Grants Mineral Belt, New Mexico

Location Number	Description	Gross Alpha	Ra-226 NEIC	Ra-226 EMSL	U-234	U-235	U-238	U-nat.	Th-230	Th-232	Po-210
Ambrosia Lake (Continued)											
9215	KM-4c	104± 37	2.5 ± .2	2.7 ± .30					0.17 ±.057	< 0.016	< 0.2[illegible]
9216	KM-47	45± 25	0.64 ± .02						0.079±.038	< 0.017	0.29 ±0.[illegible]
9217	KM-20	70± 38	0.94 ± .03	0.72 ± .16					0.055±.035	< 0.016	1.[illegible] ±0.84
9218	KM-5-1	20± 24	0.34 ± .02	0.34 ± .11					<0.021	< 0.016	3.[illegible] ±2.[illegible]
9219	KM-5-2	67± 42	0.59 ± .02	0.76 ± .17	12 ± .63	0.27± .039	6.7 ± .37		<0.039	< 0.031	0.96 ±0.64
Gallup-Churchrock											
9137	Erwin Well	10 ± 9	0.63 ± .03								
9138	Boardman Trailer Park	6 ± 8	0.64 ± .02						0.088±.038	< 0.019	0.27± .20
9139	T. Hassler	14 ± 11	0.22 ± .01								
9140	Dixie Well	6 ± 10	0.11 ± .01	0.15 ± .082	1.8 ± .16	0.053±.022	1.4 ± .14		<0.030	< 0.016	0.50 ± .20
9141	Churchrock Village	3 ± 7	0.12 ± .01	0.26 ± .10				0.02 14	<0.028	< 0.016	0.23 ± .11
9142	White Well	9 ± 9	0.16 ± .01	0.42 ± .13					0.073±.035	< 0.011	<0.080
9143	Togav Well(same as 9221)	14 ± 9	0.83 ± .04	0.38 ± .12					<0.044	< 0.034	0.42 ± .17
9220	Hardground Flats Well-CRKM-2	12 ± 10	0.12 ± .01								
9221	E.Puerco River Well-CRKM-11	17 ± 10	0.56 ± .02	0.21 ± .093					<0.029	< 0.016	0.19 ± .18
9222	Puerco Well CRKM-16	2 ± 9	0.57 ± .02								
9223	Pipeline Road Well-CRKM-5	4 ± 9	0.37 ± .02						0.037±.029	< 0.012	0.52 ± .15
9224	Iosa Rock Well CRKM-3	24 ± 12	0.13 ± .01						0.053±.049	< 0.036	0.23 ± .15
9225	U.E. Pipeline Well CRKM-10	12 ± 15	0.29 ± .01						<0.015	< 0.011	0.56 ± .33

1. Concentrations ± two sigma counting error in pCi/l . U-natural reported as mg/l and in pCi/l, respectively.

Sources of analyses:
Environmental Monitoring and Support Laboratory, USEPA: Ra-226, U-234, U-235, U-238, Th-230, Th-232, Po-210, Pb-210
National Enforcement Investigations Center, USEPA: Gross alpha, Ra-226, U-nat.

All analyses except U-nat. are on the filtered sample and therefore represent the concentrations actually in solution.
U-nat. is analyzed using unfiltered water and represents both the dissolved and suspended fractions.

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Table 5

Typical Background Ground Water Radionuclide Concentrations (pCi/l) by Geographic Area & Aquifer [1]

Radionuclide/Aquifer		Paguate-Jackpile	Grants-Bluewater	UNHP	Ambrosia Lake	St. Lus-Churchrock
^{226}Ra	Bedrock	0.31 ± .09	0.14 ± .01	0.36 ± .01	0.16 ± .01	0.12 ± .01
	Alluvium	<0.18[3]	0.13 ± .01	0.19 ± .02	0.23 ± .02	0.11 ± .01
^{210}Po	Bedrock	0.43 ± .14	0.33 ± .15	0.35 ± .09[2]	0.57 ± .19	0.35 ± .19
	Alluvium	<0.39[3]	0.30 ± .14	<0.31[3]	0.27 ± .18	0.27 ± .17
^{230}Th	Bedrock	<0.020	<0.032	<0.033	<0.023	<0.036
	Alluvium	<0.018[3]	<0.013	<0.014	<0.028	<0.051
^{232}Th	Bedrock	<0.013	<0.015	<0.016	<0.013	<0.024
	Alluvium	<0.310[3]	<0.013	<0.013	<0.019	<0.015
^{234}U	Bedrock	---	---	---	---	---
	Alluvium	---	---	<10[3]	<12	<1.3[3]
^{235}U	Bedrock	---	---	---	---	---
	Alluvium	---	---	<0.28[3]	<0.29	<0.053[3]
^{238}U	Bedrock	---	---	---	---	---
	Alluvium	---	---	<7.7[3]	<8.3	<1.4[3]
U-Natural						
	Bedrock	14[3]	---	---	---	---
	Alluvium	27[3]	---	54	68[3]	14[3]

(1) Average of lowest reported concentrations of this study. ^{226}Ra and U-natural analyses by UNC, all other radionuclide analyses by ENSL.
[2] Based on Chinle Formation.
[3] Results of only one sample reported; therefore, two sigma error of 100% assumed for these values.

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bedrock aquifers in the Churchrock mining area mostly include the Dakota Sandstone. In the Paguate-Jackpile area, three of the four wells examined are in the Morrison Formation (Jackpile Sandstone Member).

Table 6 is a compilation of uranium, radium, and gross

Table 6 is a compilation of uranium, radium, and gross
beta concentrations in ground water for various localities in the Grants Mineral Belt. These are largely from the ore bodies or from strata adjacent thereto, and are intended to show natural concentrations of these radionuclides. Despite the wide variations, radium rarely exceeds 10 pCi/l and is commonly less than 5 pCi/l, except in mines or in ponds formed from mine drainage. Dissolved uranium is also enriched in waters associated with active mines and can readily reach concentrations of several hundred pCi/l. Natural background uranium levels are difficult to estimate from the limited data but would appear to be on the order of 20 pCi/l or less. Concentrations markedly greater than the foregoing, particularly if associated with mining and milling activity, may be evidence of degradation.

Bluewater-Milan-Grants

The relationship of the Anaconda Company mill and tailings pile to local geologic and cultural features is shown in Figure 3. Cultivated areas in the photograph are situated in Bluewater Valley which contains the town of Bluewater on the western edge. The irregularly shaped landforms northeast and east of the mill are basalt lava flows which are also the substrate for a portion of the tailings ponds. Also shown is the proximity of the San Andres Limestone to the tailings ponds. The light colored areas in the tailings pond are composed of sand, whereas the darker gray and black patterns indicate wet slimes and free water surface, respectively.

The expected impacts of uranium mining and milling on groundwater in the developed area between Bluewater and Grants can be traced to the Anaconda Company mill. It is unlikely that the United Nuclear-Homestake Partners mill could adversely affect ground water in this area.

Significant introduction of wastes into ground water in the Bluewater area occurs as a result of seepage from the tailings ponds. Past investigators noted the migration of nitrate from the ponds (New Mexico Department of Public Health, 1957). Changes in the milling process greatly

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Table 6

Summary of Reported Concentrations
for Radium, Gross Beta and Natural Uranium in Ground Water in the Grants Mineral Belt[1]

Location T	R	S	Q	Source	Depth (meters)	Aquifer[2]	Radium pCi/l	gross β pCi/l	U natural dissolved pCi/l
9	12	11	222	Paxton Spring	Spring	Qb	4.3		1.82
12	11	24	4	Industrial Well	109		0.4		4.27
12	11	24	4	Anaconda Well (Injection)	109	Ps	0.36		
12	12	4	343	bluewater Lake	Surface		<0.1		0.84
12	10	8	3	Well	442	Pym	0.2±0.1		1.96
13	8	30	100	El Paso Natural Gas Co.		Jmw	8.5±1.7	36 ± 5	
13	8	30	200	El Paso Natural Gas Co.		Kd	2.9±0.6	12 ± 2	
13	9	29	144	Westvaco Mineral Development Co.		Jt	5.1	150	
13	9	29	41	Mine Drift	137	Jt	5.1		139
14	9	28	441	Well		Jmw	1.1		<.07
14	9	32	413	Well	174	Jmw	10 ±2		8.4
14	9	32	221	Mine Drift		Jmw	42		16.1
14	9	17	400	Kermac Nuclear Fuels Corp.		Kd	2.7±0.5	18 ± 3	
14	9	18	400	Kermac Nuclear Fuels Corp.		Jmw	5.6±1.1	37 ± 6	
14	9	28	143	Kermac Nuclear Fuels Corp.	216	Jmw	1.1	69	
14	9	29	312	Phillips Petroleum Co.	224	Jmw	10 ±2	39 ± 7	
14	9	30	200	Kermac Nuclear Fuels Corp.		Jmw	2.0±0.4	12 ± 2	
14	9	32	122	Homestake-New Mexico Partners	190	Jmw	42	49	
14	9	32	314	Homestake-New Mexico Partners	168	Jmw	1.1±0.2	18 ± 4	
14	9	34	422	United Nuclear Company	306	Jmw	1.4±0.3	9.0± 1.5	
14	9	36	313	United Nuclear Company		Kd	27 ±5	75 ±11	
14	9	36	313	United Nuclear Company	457	Jmw	1.2±0.2	6.5± 0.9	
14	10	24	100	Kermac Nuclear Fuels Corp.		Jmw	2.3±0.5	56 ± 8	
15	12	17	123	Homestake-Sapin Partner	372	Jmw	0.2±0.1	9.8± 1.4	
17	12	20	11	Crownpoint Well 1	714	Jmw	0.05		<0.28
17	16	35	14	UNC-NE Churchrock Mine	457	Jmw	0.62		185
17	16	35	14	UNC-NE Churchrock Mine	518	Jmw	0.09		22
17	16	35	14	UNC-NE Churchrock Mine	549	Jmw	8.10		847
17	16	35	12	KM-Section 35, Churchrock Mine	549	Jmw			
25	14	3	13	Gas Company Burnham Well 1	1585	Jmw	0.24		0.05
				Pond in South Paguate pit	Pond		190		170

1. Data sources are as follows:
   - Ambrosia Lake area: Cooper and John, 1968
   - Laguna-Paguate: Lyford, 1975
   - Churchrock: Hiss and Kelley, 1975
   - Grants-Bluewater-Prewitt: Stow, 1961

   Grants-Bluewater-Prewitt:

2. Aquifers:
   - Qb basalt flow
   - Kd Dakota Fm.
   - Jmw Morrison Fm., Westwater Canyon Mbr.
   - Jt Todilto Fm.
   - Ps San Andres Ls.
   - Pym Yeso Fm, Meseta Blancha Mbr.

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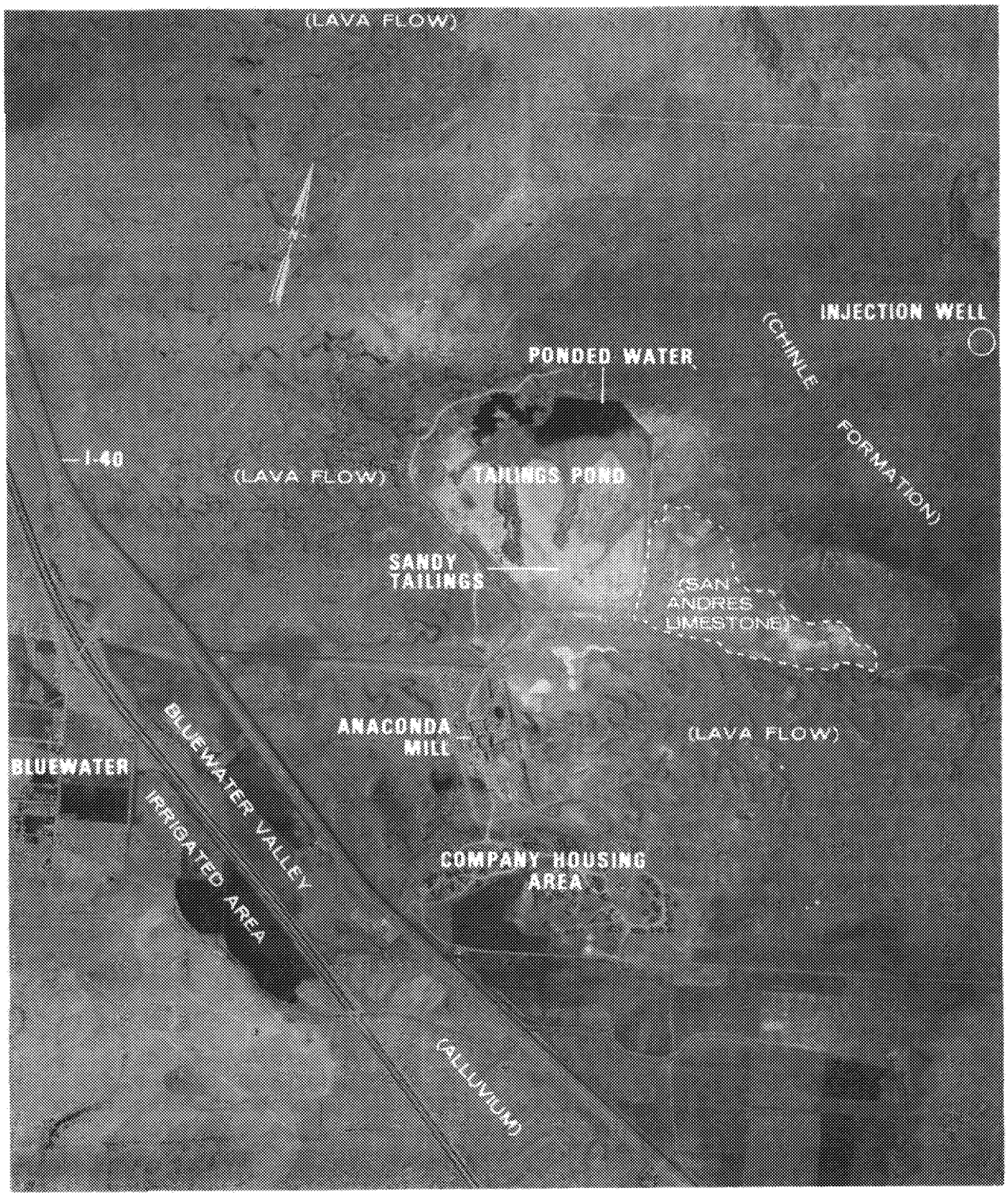

Figure 3. The Anaconda Company Uranium Mill and Tailings Pond-Bluewater

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reduced the nitrate content in the effluent, but seepage has continued at a rather high rate, averaging 182.9 x 10^6 liters per year for 1973-1974 (Gray, 1975). The average volume injected in the same period was 348 x 10^6 liters. Therefore, the seepage:injection ratio is 0.53. In essence, one third of the waste stream portion not evaporated enters the shallow aquifer. Assuming that this ratio applies to the period 1953-1960, seepage is estimated at 3200 x 10^6 liters or 845 million gallons. From 1953 to mid-1960, the seepage fraction was probably larger, but is unknown. Discounting this seven-year period and assuming an average radium concentration of 125 pCi/1, seepage has introduced 0.41 curies of radium to the shallow aquifer, which is very definitely potable.

The New Mexico Department of Public Health (1957) compared pre-1955 and 1956-1957 nitrate data for nearby wells completed in alluvium and in the San Andres Limestone. It was concluded that nitrate contamination occurred between 1955 and 1957 after only two years of milling. At the time of the field study (June-Nov., 1956), it was estimated that 87 percent of the effluent leaked from the 28.4 hectare pond at a rate of about 10,000 liters/minute. The plant manager at the time expected that slimes in the waste would seal the bottom of the lagoon in about a year. However, the present loss rate of 347 liters/minute from a ponded area of about 14.4 hectares shows that leakage continues.

As of May 1957, two wells in the shallow aquifer and three in the deep (San Andres Limestone) aquifer had nitrate concentrations of 66 to 84 mg/1 (15-19 mg/1 NO_3-N), and elevated nitrate levels were present as far as 10 kilometers downgradient from the lagoon or 4.5 kilometers from the Grants supply wells. At the present time, the maximum nitrate concentrations in the bedrock and alluvial aquifers within 4 kilometers of the ponds are 39 and 17.3 mg/1. Concentrations in two wells midway between the ponds and Grants average 21.5 mg/1. In the 1956 study it was also concluded that high nitrate within 4.5 kilometers of Grants was a result of waste disposal. This would imply movement of 10 kilometers in 2 to 3 years, which is extremely unlikely.

To evaluate ground-water quality trends, available nitrate (expressed as nitrate), TDS, chloride, sulfate and gross alpha data (from the foregoing study, from the Anaconda Company (Gray, 1975), and from the present investigation), were plotted to determine changes in ground-water quality with respect to distance from the tailings ponds and with time.

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These data show that there is a general lack of marked deterioration in ground-water quality with time; and, with the exception of gross alpha, there is close agreement between the company data and those from the present study. For example, the Fred Freas well (#9127), completed in alluvium, and the Mexican Camp well (#9120), which taps the San Andres Limestone, show essentially no change in TDS, sulfate, chloride, or nitrate for the period 1956 to 1975. The slight decline in TDS in the Fred Freas well is contrary to what would be expected if gross contamination was present. However, the similarity between gross alpha and sulfate fluctuations for the Mexican Camp well suggest that wastes are within the well's area of influence.

The selenium, vanadium, and total dissolved solids (TDS) data for the Bluewater-Grants area generally substantiate the foregoing interpretation and hint at the possibility of contamination of the alluvial aquifer. Selenium ranges from less than 0.01 mg/l to 0.02 mg/l, with most values being 0.01 or less. Vanadium ranges from 0.3 to 1.3 mg/l and is lowest in the Anaconda monitor well (#9117). Concentrations for seven wells adjacent to the Anaconda mill and tailings ponds average 0.89 mg/l, which is two to three times higher than the average for the remainder of the study area (see Table 3). It is suspected that these elevated levels are indicative of contamination, but they may simply reflect the normal concentration of vanadium in the alluvial and San Andres Limestone aquifers. Water supply well #2 at the United Nuclear-Homestake Partners mill is also completed in this formation and contains 1.3 mg/l. Additional sampling is recommended to characterize background and contaminated levels before definite conclusions are drawn. With the exception of the Jack Freas well (#9129), which is used for domestic supply, the selenium and vanadium concentrations are within recommended drinking water standards.

Radium and nitrate concentrations in ground water are depicted in Figure 4. With the exception of the Berryhill Section 5 well (station #9121) and the Anaconda injection well (#9021), radium-226 in both the alluvial/basalt aquifer and in the underlying San Andres Limestone ranges from 0.06 to 0.42 pCi/l. If well #9124 is considered as a background, radium in the alluvial aquifer decreases as a function of distance from the tailings ponds. The elevated radium level in well #9123 is postulated on the basis of a radial flow pattern centered on the tailings ponds and superimposed on the natural ground-water flow which is southeastward. In

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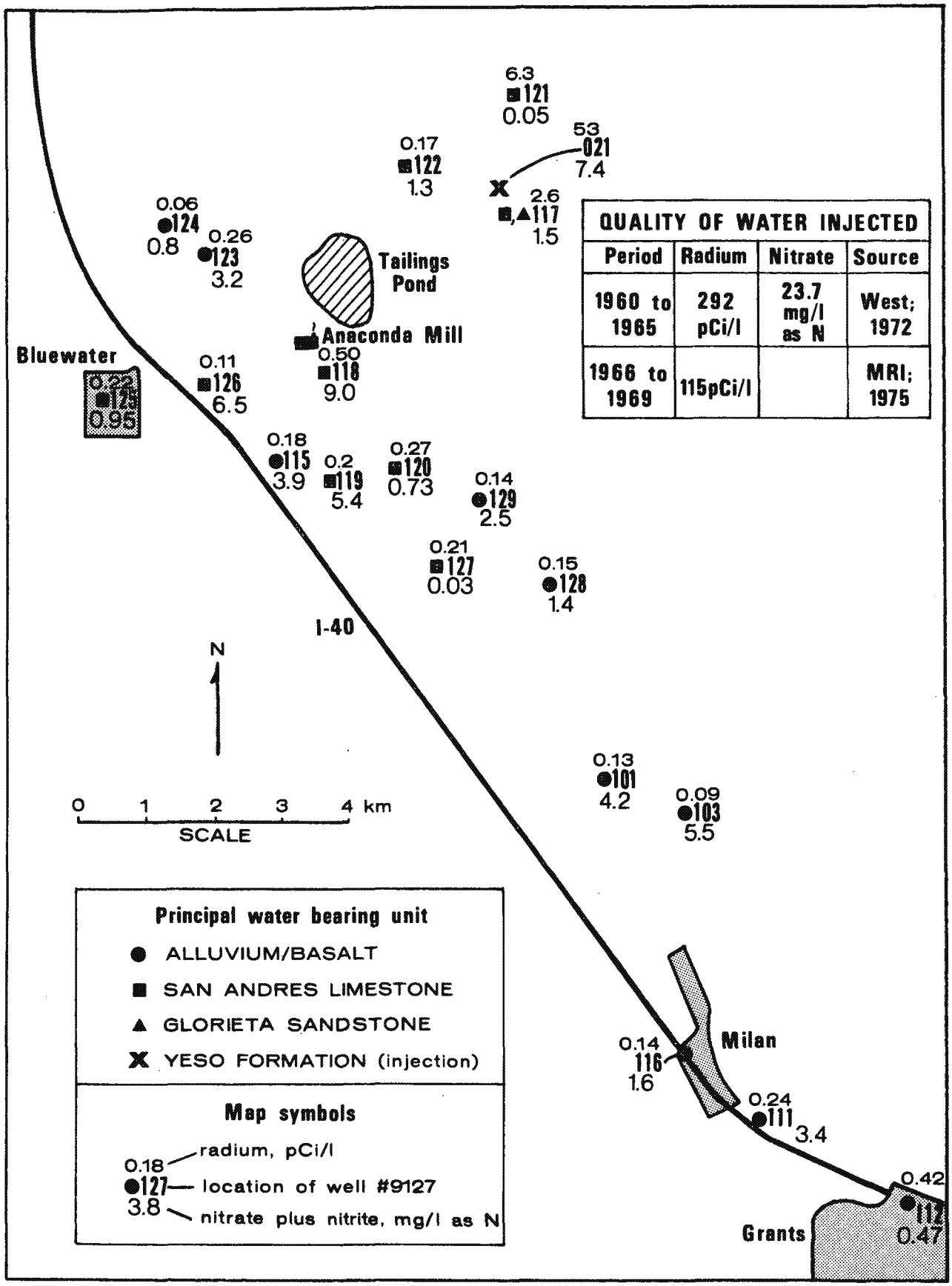

Figure 4. Radium and Nitrate Concentrations in Ground Water in the Grants-Bluewater Area

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this direction, wells #9115, #9129, #9128, #9101, and #9103 could also be affected. The gradually reduced concentrations along the flow path may reflect dilution and sorption effects or they may simply be coincidental. For unknown reasons, the trend reverses in the Milan-Grants area, and concentrations begin to increase along the flow path. With the exception of wells #9101 and #9103, essentially the same pattern is true for nitrate. Variations in chloride, which is also a likely indicator of mill effluent, do not fit the pattern for radium and nitrate and, to some extent, weaken the conclusion that contaminants are recognizable in the alluvium.

In the San Andres Limestone and Glorieta Sandstone, radium concentrations range from 0.11 to 2.6 pCi/l (0.11 to 0.50 if well #9117 is excluded) and show no pronounced lateral trends. The highest concentrations (2.6 pCi/l) are in the Anaconda monitor well (#9117) and may indicate contamination (or this may simply be a naturally elevated level in the Glorieta Sandstone). Very few wells tap this formation and water quality is poorly known. Anaconda well #2 (#9118) is also relatively high in radium, nitrate, and polonium-210. It is quite possible that the well is contaminated by downward seepage of wastes from the tailings pond.

The Berryhill Section 5 well (#9121) is listed in the Anaconda Company records as being completed in the alluvium. It is equipped with a windmill and is used for stock watering. However, Gordon (1961) indicates that as of January 1958 there were two wells in the area. The active well, 221 meters deep and completed in the San Andres Limestone, replaced an older well, 107 meters deep and completed in the Chinle Formation. Therefore, contamination of either the Chinle Formation or the San Andres Limestone by injected wastes is occurring insofar as the radium-226 concentration of 6.3 pCi/l in the Berryhill Section 5 well greatly exceeds normal concentrations in either formation (see also Table 4).

Because of excessive seepage from the tailings ponds, the Anaconda Company developed an injection well to dispose of decanted effluent. According to company and U. S. Geological Survey reports (Fitch, 1959; West, 1972), favorable geologic, hydraulic and water quality conditions exist to allow this disposal method. However, subsequent evaluation of the monitoring data and inadequacies in the number and location of monitoring wells make this conclusion questionable.

From 1960 to date, injection has been into the Yeso and Abo Formations at depths of 289.6 to 433.7 meters. Between the injection zone and the lowermost potable aquifer, there is reportedly a relatively impervious sequence of sedimentary rocks, including numerous anhydrite and gypsum beds (Fitch, 1959; West, 1972). When the injection program was conceived in 1960, this sequence was considered sufficient protection for the overlying potable aquifers. Also, it was reasoned that when the waste fluid contacted the gypsum or anhydrite, as well as other disposal zone rocks, an ion exchange occurred between radium (in the fluid) and calcium (in the reservoir rocks), thereby reducing somewhat the radium concentration in the injection fluid.

Based on laboratory tests of the drill cores from the disposal zones, neutralization of the waste effluent was expected to occur. The pH of the formation waters ranges from 7.4 to 8, while the effluent has a pH of about 2.2. It was thought that the acid effluent becomes neutral or slightly basic due to the preponderance of disposal zone waters. Radium solubility would, therefore, decline. The disposal zone waters have been shown to be non-potable due to their brackish quality. Chemical analyses indicate a very high concentration of total dissolved solids, and it was reasoned that contamination of the deeper formations would not deny foreseeable use for the contained water.

Evidence of leakage from the injection zone is shown in Figure 5, which summarizes Anaconda Company data on the volumes of wastes injected from 1960 through 1973. Also shown are trends in natural uranium and chloride from the monitor well #9117, Roundy windmill, and North well (#9122) for the period 1969 through 1973. It is readily apparent that both chloride and uranium concentrations in all three monitoring wells are increasing with time and vary directly with the volumes of waste injected. The concentration of polonium-210 in the Monitor well exceeds that in all other wells in the Bluewater-Grants area and is well above the average of 0.33 pCi/l for six wells in bedrock. Concentrations of chloride and natural uranium in the waste water average 2010 ppm and 7340 pCi/l, respectively, for the period 1960 to 1965 (West, 1972). Radium from 1960 through 1969 averages 221 pCi/l (Clark, 1974). According to the partial chemical data for these three monitoring wells and contrary to original projections, contamination apparently extends into the San Andres Limestone.

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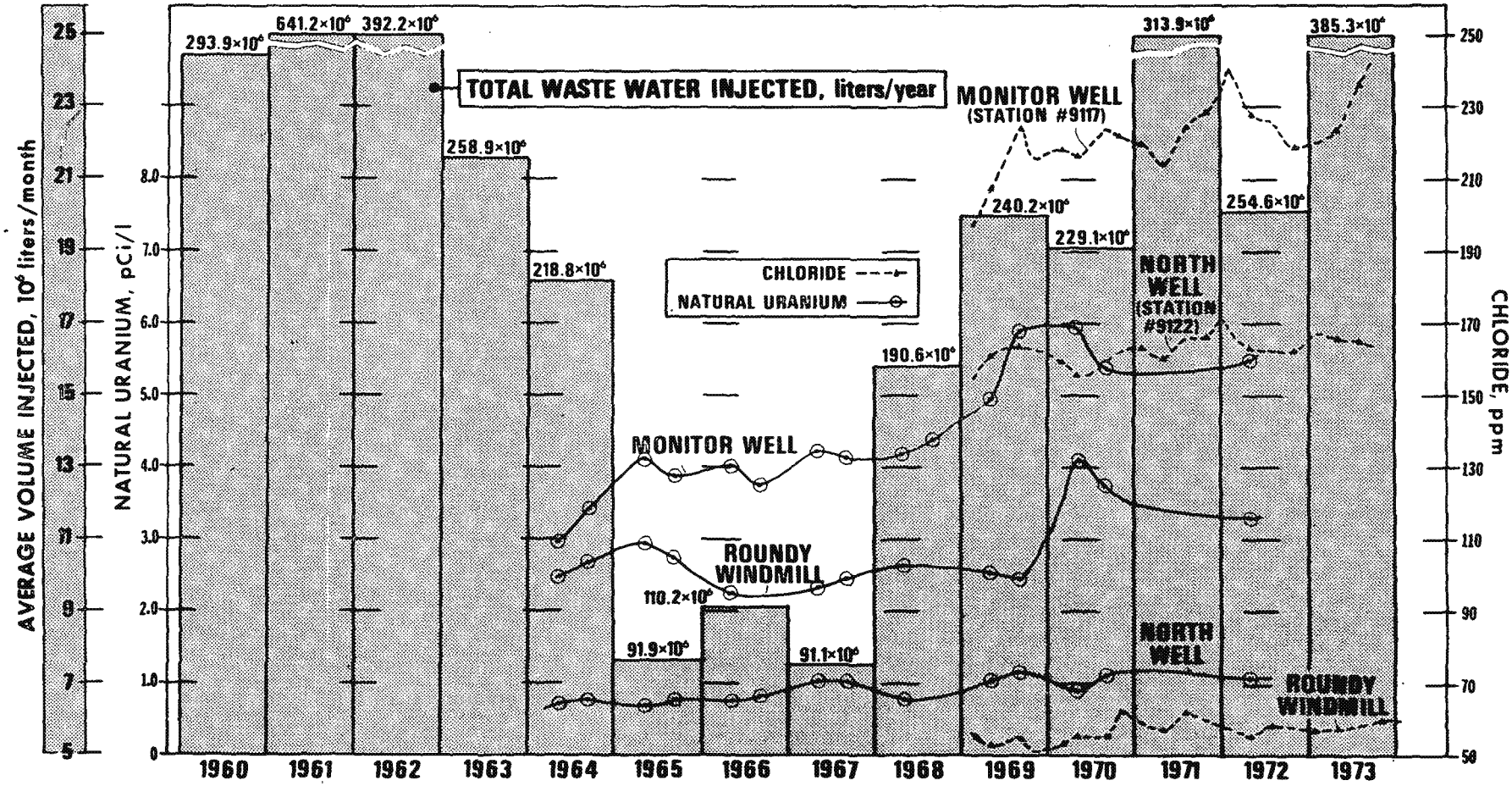

Figure 5. Summary of Waste Volumes Injected via the Anaconda Disposal Well and Water Quality in Selected Monitoring Wells

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Sulfate, TDS, and gross alpha in North well (#9122) and in the Monitor well (#9117) are increasing slightly with time. For North well, TDS increased at a rate of about 13 mg/1 per year and has gone from 1680 mg/1 in June 1956 to 1900 mg/1 in February 1975. Gross alpha is apparently increasing about 0.1 pCi/liter per year, but the company analytical results of about 2 pCi/1 are markedly below the 30 pCi/1 reported herein.

At the present time, ground water developed for potable use does not appear to be adversely affected by the Anaconda disposal practices. This conclusion is based on analyses for seven wells (9118, 9119, 9124, 9125, 9126, 9127 and 9129) completed in bedrock and in alluvium and generally located peripheral to and within 4 kilometers of the tailings ponds. Anaconda supply wells #2 and #4, which show slightly increasing trends for TDS, chloride, or sulfate, are closest to the ponds and are used for potable and mill feed purposes. For the remaining wells, increasing and decreasing trends for TDS and sulfate are present whereas chloride, nitrate and gross alpha results are rather stable. Because of its proximity to the Anaconda tailings ponds and because of its use as a public water supply, the LDS well in Bluewater should be more routinely monitored for nitrate and radium.

In summary, the interpretation of ground-water quality offered by the New Mexico Health Department (1957) is not supported by subsequent data. Concentrations of nitrates and chloride, in particular, are not markedly different today than in the base period from 1953 to 1956. Data for the period 1956 to 1969 may bear out the earlier predictions of gross contamination; but, if so, water quality since 1969 is only slightly changed. For widespread ground-water contamination to quickly occur from 1955 to 1956 and then rapidly attenuate is very unlikely considering the dynamics of ground-water flow and the continuing history of waste disposal. It is a matter of conjecture whether the earlier data were faulty or were misinterpreted. Ground-water flow patterns in the vesicular basalt and interbedded alluvium underlying the northwest pond and portions of the main pond are not described in the available references. Complex permeability distributions and waste density considerations add further complications. However, seepage is occurring and it is possible that the Company estimates stated above are conservative.

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The foregoing comments do not imply that ground-water contamination is absent. Gross contamination of nearby wells, or a continuation of the earlier, perhaps erroneous predictions of contamination, is not apparent. The major qualification of these conclusions is that wells properly located and completed for sampling purposes are not available; hence, the extent of contamination is not well understood. Contamination is evident in the North and Monitor wells but is not yet a problem. Available chemical data for pre- and post-injection periods should be evaluated, together with monthly or quarterly injection volumes, to further confirm or deny the trends shown in Figure 5. If the trends shown are valid, thorough reevaluation of the injection method of waste disposal and construction of additional monitoring wells in the Yeso Formation and the Glorieta-San Andres is in order. Such measures are particularly important if increasing concentrations of radium-226 (and possibly lead-210) are appearing in the aquifers above the injection zone.

United Nuclear-Homestake Partners Mill and Surrounding Area

The mill is partially surrounded on the southwest or downgradient side by housing developments and irrigated farm lands, both of which depend on local ground-water supplies. Also obvious in Figure 6 is a darker seepage area around the base of the tailings pile. The seepage is collected and pumped back to the pond above the sandy tailings, but seepage from the pile proper and from the encircling moat can enter the ground-water reservoir. The five-sided polygon adjacent to the mill buildings is an inactive tailings pile that was formerly part of the Homestake-New Mexico Partners mill. In the upper left-hand portion of the photograph is shown the terminus of the San Mateo Creek drainage from the San Mateo and Ambrosia Lake areas.

Three distinct aquifers are present in the area of the mill and surrounding developments. In ascending order, these include the San Andres Limestone, the Chinle Formation, and the alluvium. Water table conditions and a southwestward lateral flow gradient prevail in the latter, with static water levels about 15 meters below land surface. The San Andres Limestone originally was under artesian head, but heavy pumping for irrigation and for industry has removed much of the head once present. Data presented by Gordon (1961) indicate a downwind flow gradient, but the permeability of the Chinle Formation is low, and actual vertical

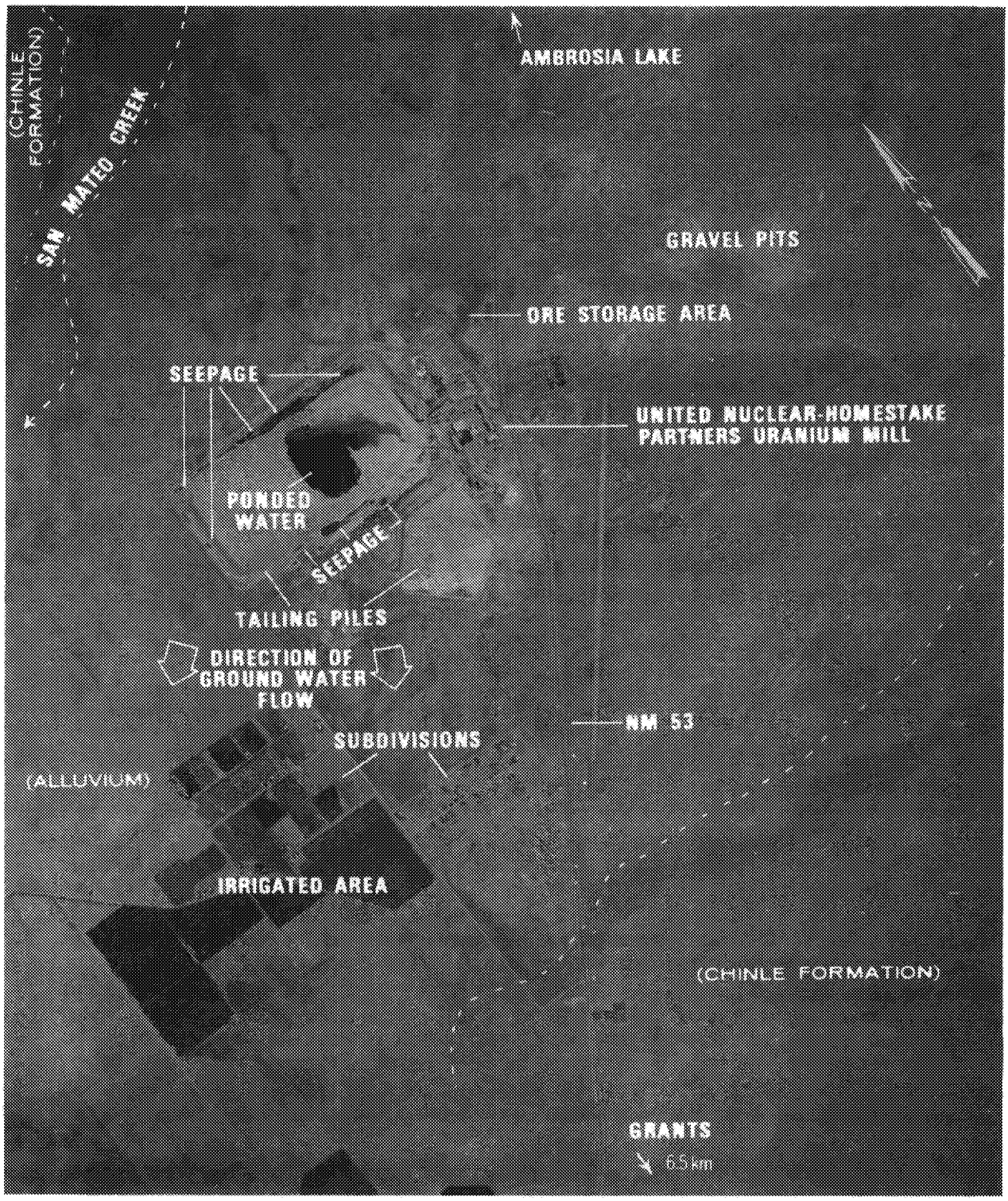

Figure 6. The United Nuclear-Homestake Partners Uranium Mill and Tailings Ponds-Milan

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water transfer is probably minimal. The chief significance of these hydrogeologic conditions is that liquid effluents produced by the uranium milling operation are likely to infiltrate at the mill site and travel in a south-southeast direction toward the nearby subdivisions. Water quality in the Chinle Formation and the still deeper San Andres Limestone is likely to be unaffected.

Radium concentrations in groundwater (Figure 7) from the San Andres and Chinle range from 0.05 to 0.27 pCi/1, with a mean of 0.16 pCi/1 for six determinations. Realistically, assuming that minimum detectable amount is 0.1 pCi/1 versus 0.05, the average increases to 0.18 pCi/1. The peak value from shallow wells tapping the water table aquifer in the alluvium is 1.92 pCi/1 in well D, the single active monitoring well (#9135). Although below the PHS drinking water standard of 3 pCi/1, this value does indicate movement of contaminants away from the tailings pond. Attenuation due to sorption may mask a very sharp concentration gradient between this well and the pond. At a distance of approximately 0.6 kilometers from the ponds, radium in the shallow aquifer reverts to levels of 0.13 to 0.72 pCi/1 and averages 0.36 pCi/1, or about twice that present in the bedrock reservoirs at depth. Relatively high concentrations (0.72, 0.61 pCi/1) in the Worthen and Enyart wells may reflect plumes or fronts of contaminants that have advanced ahead of the main body. The water table map (Figure 8), prepared by Chavez (1961), portrays an elongated, northeast-trending lobe or mound centered on the smaller tailings pile from the now inactive Homestake-New Mexico Partners mill.

The possibility of ground-water pollution from the United Nuclear-Homestake Partners tailings pond was noted in the early 1960's (Chavez, 1961). Samples from on-site monitoring wells completed in the alluvium contained from 0.8 to 9.5 pCi/1 radium despite the fact that ore had been processed for less than two years. These concentrations are markedly above the normal range of 0.1 to 0.4 pCi/1 in wells several miles west of the mill and from wells in the alluvium between San Rafael and Grants.

Chloride and TDS data for well #9107 (Figure 7) support the idea of a tongue of contaminated ground water in the area between this well and the tailings pile. Nitrate in this well was 62 mg/1 and, therefore, does not meet the PHS Drinking Water Standard of 45 mg/1. Infants and fetuses are particularly susceptible to nitrate poisoning at concentrations above 45 mg/1, and alternate sources of potable water should be utilized. Heterogeneities in sediment permeabilities, coupled with irregular induced flow gradients resulting

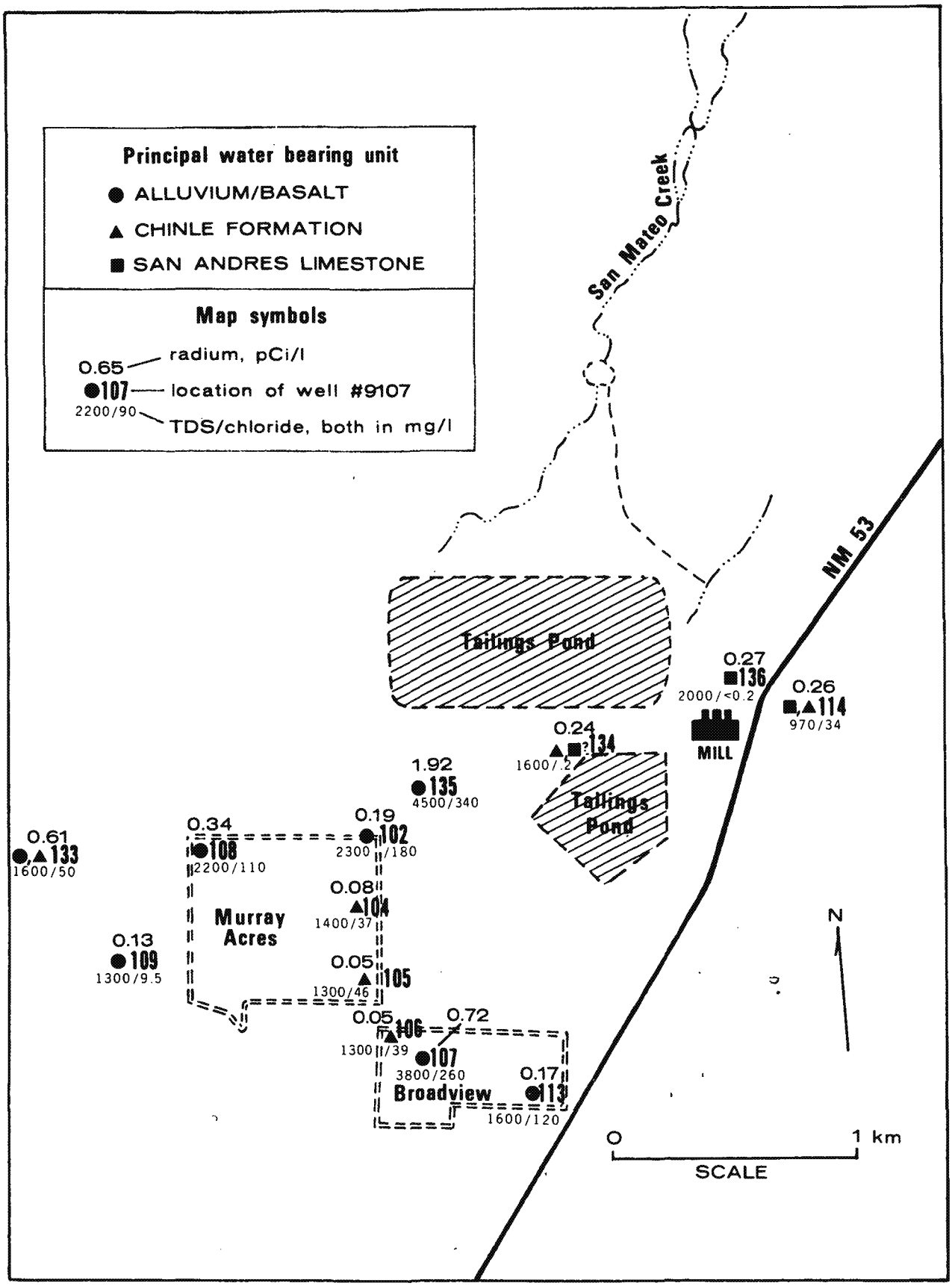

Figure 7. Radium, TDS and Chloride in Ground Water Near the United Nuclear-Homestake Partners Mill

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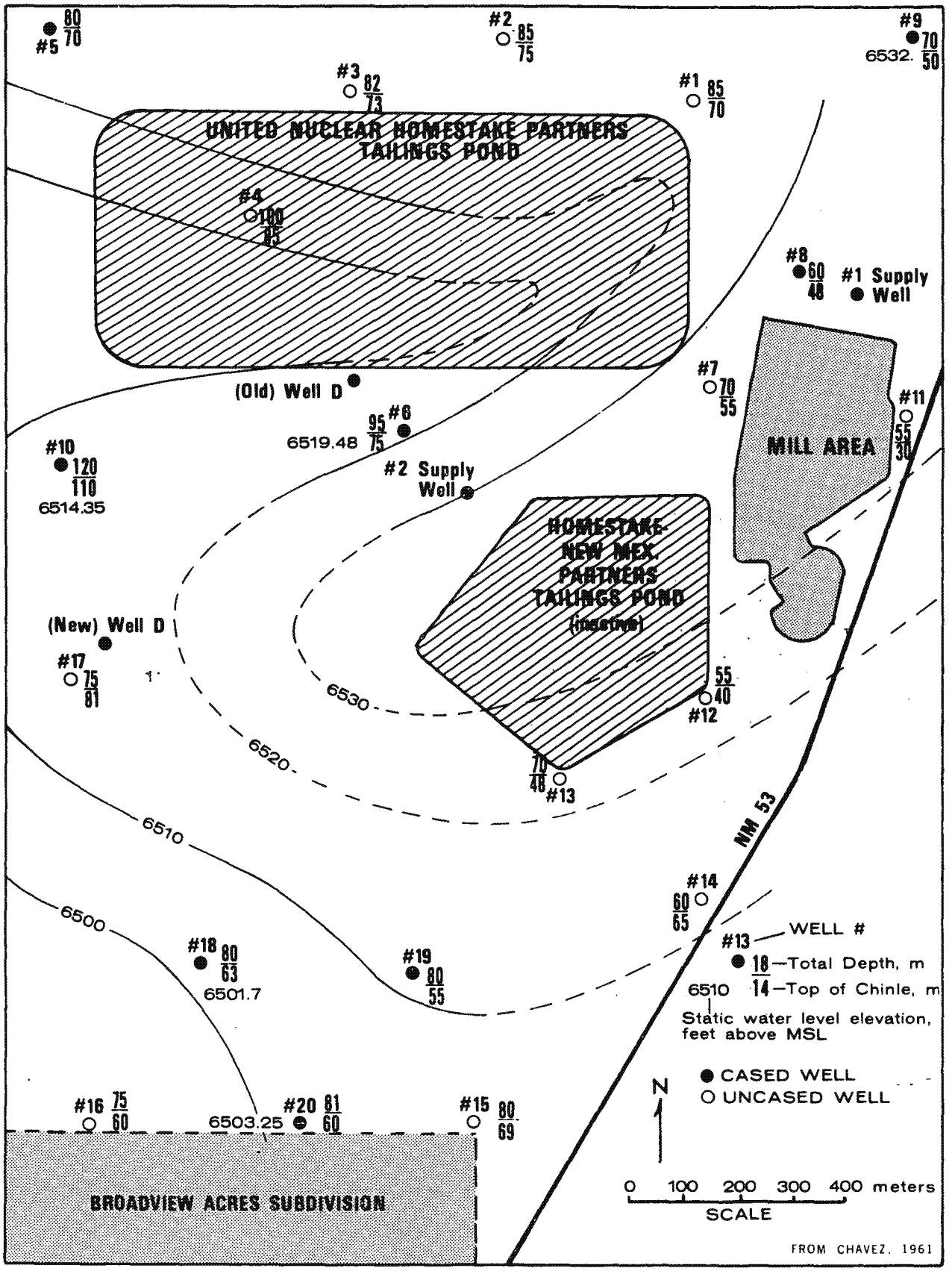

Figure 8. Water Table Contours and Well Locations at the United Nuclear-Homestake Partners Mill Site

07164

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from seepage return flows, make definition of the polluted front rather difficult. It is clear that one well (well D, #9135) is inadequate for the task.

Selenium concentrations (see Table 3) in several of the domestic wells located downgradient from the mill are anomalously high and are, perhaps, the best indicator of ground-water contimination. Nearby wells (#9102, #9107, and #9113) contain from 20 to 106 times the recommended maximum selenium concentration of 0.01 mg/1 (National Academy of Sciences-National Academy of Engineering, 1972). Two of the wells contain approximately two-thirds of the concentration in the monitor well (1.52 mg/1). The water supply for the mill contains <0.01 mg/1, whereas the seepage collection ponds adjacent to the presently active pile contain 0.92 mg/1. Because of analytical difficulties and differences between laboratories, the selenium data are most useful to show elevated trends rather than necessarily an absolute concentration in the ground-water system. Additional sampling is necessary to more accurately define the extent of contamination.

Elevated levels of polonium-210 are present in well D (#9135) and in other wells (#9102, #9106, #9107, and #9113) downgradient from a suspected contamination front in the shallow aquifer. Background for polonium-210 is approximately 0.34 pCi/1 (Table 5) in wells tapping either the Chinle Formation or the alluvium, whereas concentrations range from 1.0 to 2.3 pCi/1 in wells suspected to be contaminated. The highest value for polonium-210 was from well D (#9135). The elevated level of polonium-210 in supply well #2 (#9134) cannot be explained.

Provision of an alternative water supply is strongly recommended to avoid consumption of shallow ground water exceeding 0.01 mg/1 selenium. Deeper wells completed only in the Chinle Formation and preferably fully cemented in the interval from land surface to 15 meters into the Chinle should be considered minimum. Other alternatives include the construction of high capacity wells nearby, but away from the developments, or placing the developments on the Milan municipal water system.

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Ambrosia Lake Area

The Kerr-McGee mill is located on the dip slope of a southeast-facing cuesta in an area underlain by a thin veneer of silt and clay alluvium over the Mancos Shale. Shown in Figure 9 is the large network of tailings ponds and water storage reservoirs built by excavation and by selectively sorting the coarse tailings for retention dams. Discharge from numerous mines and from ion exchange plants gives rise to perennial flow in Arroyo del Puerto which trends north-south. Seepage from the tailings ponds and from the aforementioned sources is evident from the vegetation present in the formerly dry washes. Shown in the upper right corner of the photograph, taken in September 1973, is the inactive tailings pile at the United Nuclear Corporation mill. The ponded water shown on the pile has since evaporated or seeped into the tailings.

Ground-water sampling in the Ambrosia Lake area focused on the Kerr-McGee tailings disposal operation and the combined impact of various ion exchange plant and mine water discharges into San Mateo Creek and Arroyo del Puerto. Because of influent stream conditions, these surface water bodies represent line sources of recharge to the shallow ground-water reservoir. Of the 22 wells sampled in the area (see Figure 10), all but 3 were part of the Kerr-McGee Nuclear Corporation environmental monitoring network. The absence of sampling points near the United Nuclear mill and tailings pile or near the active mines and ion exchange plants precluded study in these areas. Poorly understood are the effects of seepage from settling ponds and from open channels leading to the two principal streams in the area. The disposition of solutions involved *in situ* leaching is also unknown.

Nevertheless, the conservative parameters clearly indicate the infiltration of wastewater. Whereas shallow ground water beneath San Mateo Creek contains about 700 mg/l TDS in the reach above Arroyo del Puerto, the reach below has about 2000 mg/l. Ammonia increases four fold from 0.05 to 0.22 mg/l, and nitrite plus nitrate (as N) go from an average of less than 1 mg/l to 24 mg/l. The recommended maximum in drinking water is 10 mg/l. Selenium and vanadium concentrations in ground water do not markedly increase near the tailings ponds. One exception is well KM-43 (#9208) which contains 0.29 mg/l selenium as well as high radium and TDS. The Marquez windmill (#9132) is also enriched in selenium which further substantiates the TDS, chloride, ammonia, and nitrate data results which show contamination of the shallow aquifer. Nitrate, derived from

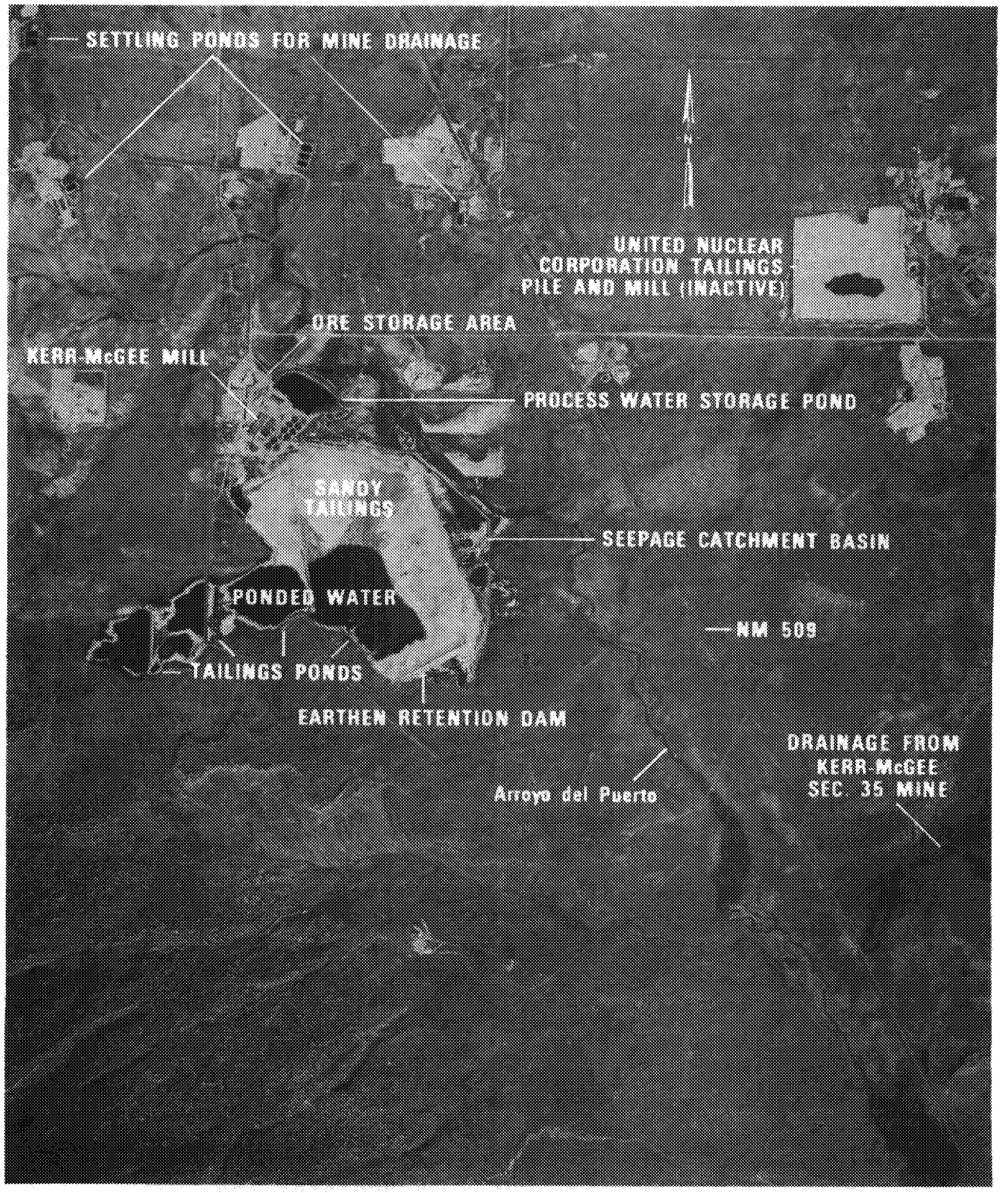

Figure 9. Kerr-McGee Nuclear Corporation Uranium Mill, Tailings Ponds, and Mines-Ambrosia Lake

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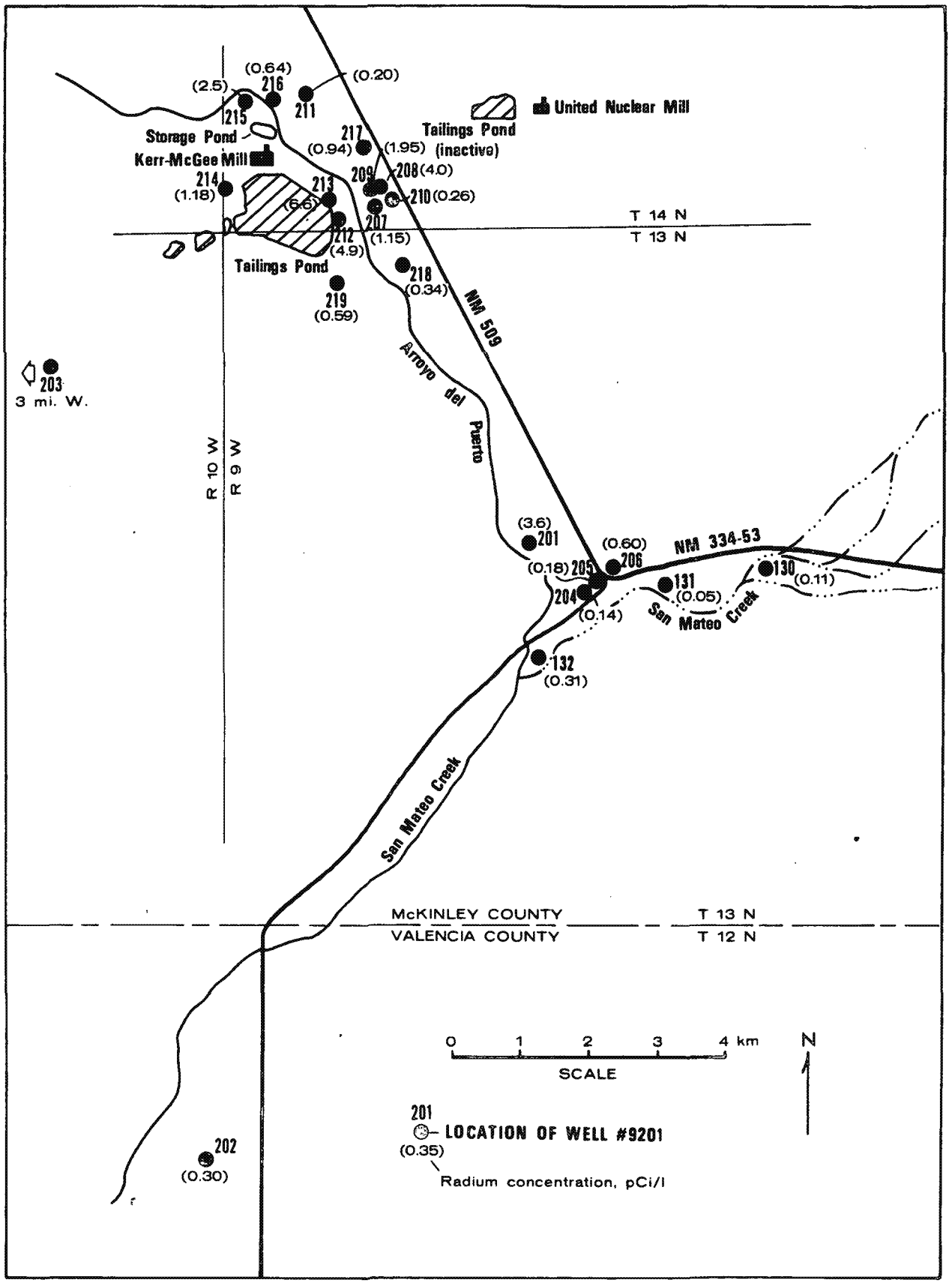

Figure 10. Radium Concentrations in Ground Water in the Ambrosia Lake Area

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very high concentrations of ammonia in the mill effluents, persists in shallow ground water. This is particularly true for shallow wells located east of the ponds and along San Mateo Creek, both above and below the county line. The range of concentration exceeding the PHS Standard is 48.7 to 350 mg/1. One of these wells (#9204-Ingersoll Rand) is used for a potable supply, whereas well #9202 is for stock watering.

The concentration of radium in ground water in the vicinity of the tailings piles at the Kerr-McGee mill averages 1.7 pCi/1 for the 12 wells sampled. The highest concentration, 6.6 pCi/1, occurs at station #9213 near the base of the seepage catchment basin and probably characterizes the quality of ground-water seeping beneath and through the retention dam. Water in the basin, per se, contains 65 pCi/1 radium. Note that high TDS, chloride, ammonia, and nitrate plus nitrite appear in the seepage. Within 1 to 2 kilometers of the tailings pile periphery, radium concentrations in shallow ground water to depths of 17 meters are 4 pCi/1 or less.

The foregoing general pattern is in agreement with the migration described by the Kerr-McGee staff at the time of the field study. Despite a concentration of 65 pCi/1 in seepage from the ponds, concentrations in the immediately adjacent ground water do not exceed 6.6 pCi/1, and quickly reduce to 4 pCi/1 or less. Seepage leaving the property and moving southeastward parallel to Arroyo del Puerto averages 0.47 pCi/1 radium.

Despite the relatively localized contamination of ground water adjacent to the Kerr-McGee tailings ponds, serious question remains concerning their adequacy as a means of waste disposal. Company data for 1973 and 1974 reveal that seepage from the ponds averaged 935 liters/minute. Influent averaged 3181 liters/minute; therefore, 29 percent of the wastes entered the ground water and the balance evaporated. Assuming 60 pCi/1 in the seepage and a 20-year operating period, 0.6 curies of radium would be introduced to ground water. The company data indicate that the seepage rate was fairly constant at 946 and 924 liters/minute for 1973 and 1974, respectively. Also shown in the water balance are additions to storage in the third quarter of each of three years (1972, 1973, 1974). The writers interpret this as overland flow related to thunderstorm activity prevalent at this time of year. The rapid influx

of overland flow into the ponds prompts questions concerning their stability and overall company management practices. The ponds are operated with very little freeboard and the berms or dikes are composed of sandy tailings that are readily eroded, particularly if overflow conditions develop. Catastrophic failure of the tailings ponds could occur.

Churchrock Area

The Puerco River at Gallup was ephemeral until upstream mining operations reached a scale such that wastewater discharge was sufficient to cause perennial flow. At present the combined discharge from the United Nuclear and Kerr-McGee mines, located as shown in Figure 11, is about 16 x 10^6 liters/day and characterized by 8 to 23 pCi/l radium, 700 to 4900 pCi/l uranium, 0.01 to 0.04 mg/l selenium, and 0.4 to 0.8 mg/l vanadium. In terms of radium, selenium, and vanadium, the water is unfit for stock or potable uses and not recommended for irrigation. Infiltration of the mine wastewater represents a remote threat to potable ground water in the vicinity of the Puerco River and possibly part of the Gallup municipal supply. In part, the present study examines whether noticeable ground-water quality deterioration has occurred to date.

Ground-water sampling in the Churchrock area involved 13 wells located along the Puerco River and South Fork Puerco River. For control purposes, an adjacent watershed tributary to the Rio Puerco was also sampled. A single sample from a newly developed well serving the Gallup area was also tested. The sampling points included water used for stock, domestic use, and for public drinking water supplies. Alluvial and bedrock aquifers were sampled in an area of 200 km^2 located generally east and northeast of Gallup.

None of the ground-water samples contain sufficient quantities of naturally occurring radionuclides to constitute a health problem. The radiochemical, trace element, and gross chemical data do not indicate that contamination of ground water is occurring as a result of the mining operations underway. However, two of the wells (#9139, #9221) contain 119.6 and 62 mg/l nitrate, respectively, and, therefore, do not meet the PHS Drinking Water Standard of 45 mg/l. The mine drainage waters contain less than 4 mg/l, hence this is not the source. Consumption of water this high in nitrates is particularly dangerous to infants and the unborn and alternate supplies should be utilized. More suitably located

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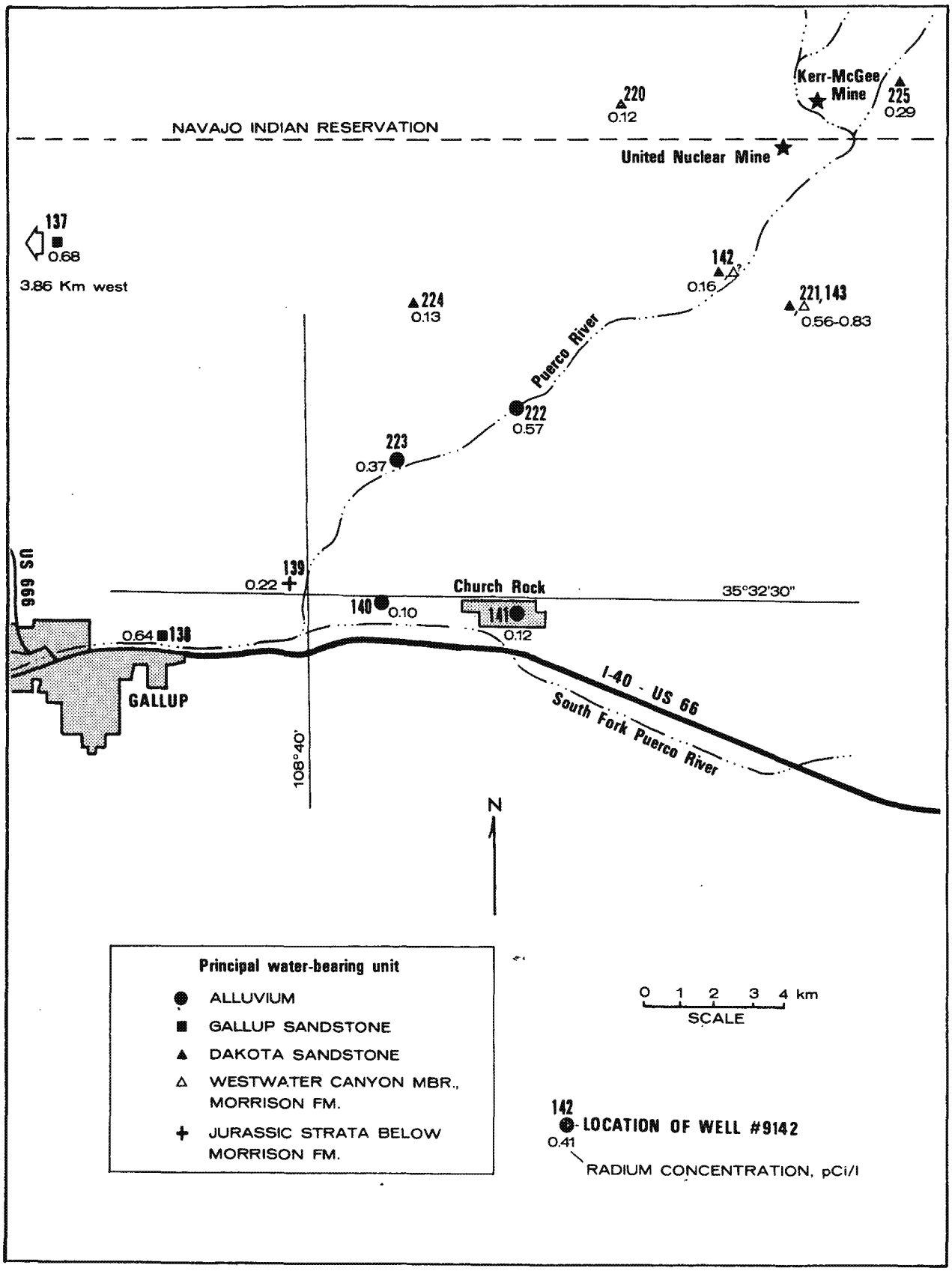

Figure 11. Radium Concentrations in Ground Water in the Churchrock-Gallup Area

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sampling points, together with revised analytical programs are strongly recommended improvements to the existing industrial efforts.

By comparison, the effects of mining on the concentration or radium in ground water are pronounced. Present discharge from the Kerr-McGee mine, which is in the development versus mining stage, averages 7.9 pCi/1 as compared to 23.3 pCi/1 for the United Nuclear mine. The latter is producing ore. In both cases, elevated radium concentrations are present. In large part, these are attributable to mining operations and practices and do not represent natural water quality, evident from samples of ground water collected from 4 wells and 3 long holes, all in the Westwater Canyon Member (Hiss and Kelley, 1975). Radium varied from 0.05 to 0.62 pCi/1 compared to 0.28 to 184.8 pCi/1 uranium. An additional sample collected in November 1973 from the settling pond discharge at the United Nuclear mine contained 8.1 pCi/1 radium and 847 pCi/1 natural uranium. Thus, initial penetration of the ore body increased radium at least 10-fold and subsequent mine development work over a two-year period resulted in another three-fold increase. Compared to natural concentrations, radium increased some 23 times. Similar trends also seen in the Ambrosia Lake area prevail, indicating that ultimate radium concentrations on the order of 50 to 150 pCi/1 are likely. This has been tentatively confirmed by company, self-monitoring data.

Jackpile-Paguate Area

Sampling in the vicinity of the Jackpile-Paguate open pit uranium mine included four wells located as shown in Figure 12. One of these (#9233) is the Paguate municipal supply which is a flowing artesian well completed in alluvium at a depth of 22.9 meters. The remaining three wells are property of the Anaconda Company and are used for potable supply and for equipment washing, etc. It is believed that all three were former exploration holes that have been reamed out, cased, and equipped with a submersible pump. The water quality is probably representative of the Jackpile Sandstone Member of the Morrison Formation, which also is the principal ore body in the Laguna mining district.

Dissolved radium in water from the Jackpile Sandstone aquifer ranges from 0.31 to 3.7 pCi/1. The latter value is from the new shop well which is a source of potable and nonpotable water for the facility. Continued consumptive use of this water is not recommended because the radium exceeds the PHS Drinking Water Standard of 3 pCi/1.

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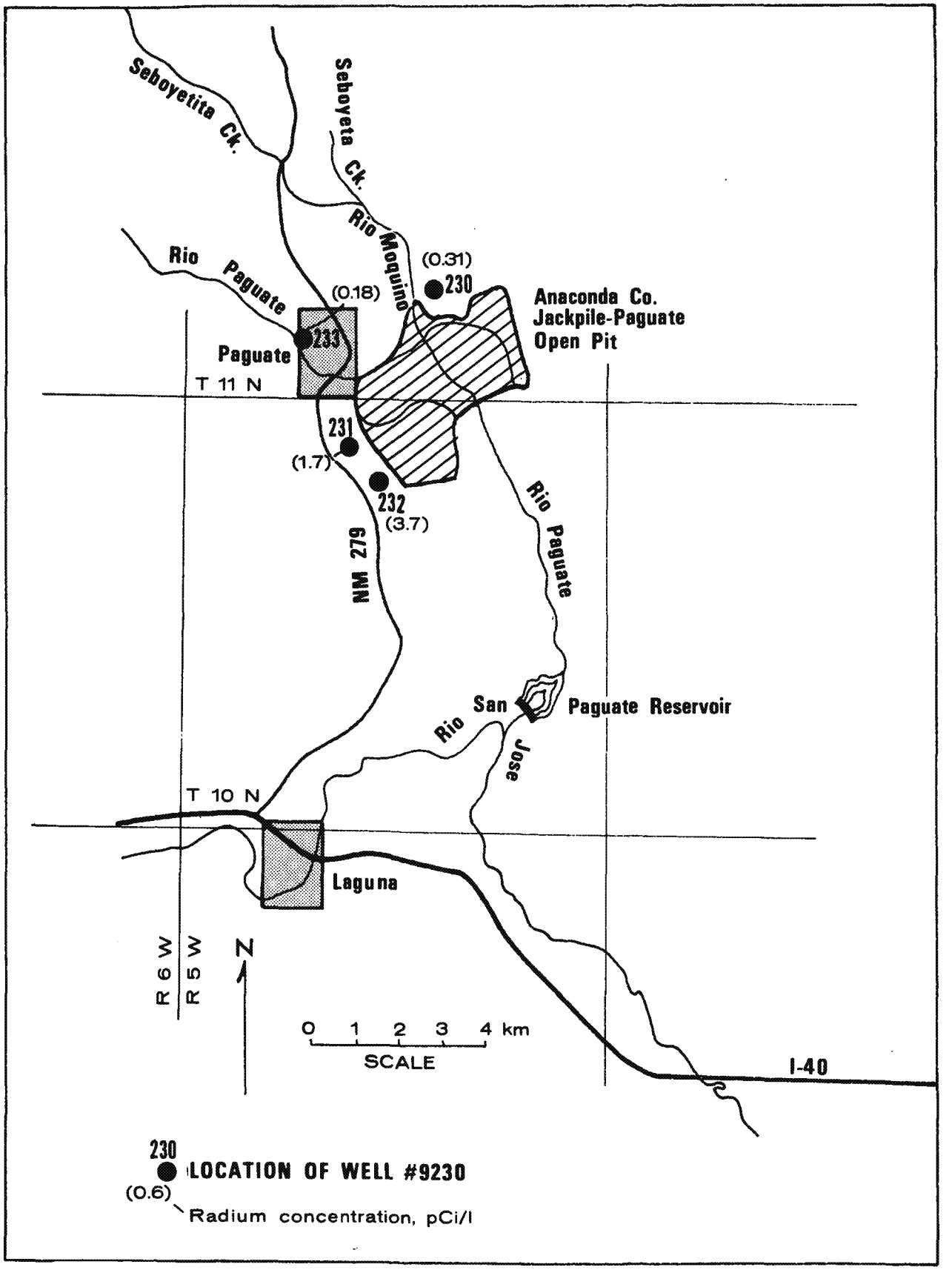

Figure 12. Radium Concentrations in Ground Water in the Paguate-Jackpile Area

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The village of Paguate water supply is well below the recommended maximum level for not only radium but also the other isotopes considered in the present study. Selenium, however, is at the maximum recommended level of 0.01 mg/l. It is extremely unlikely that the present shallow-well supply will be affected by mining unless the open pit would be extended close to the well field. Recharge to the shallow aquifer is derived from runoff which infiltrates to the west and north. After percolating southward, it then reappears in a marshy area west of the village. Springs and artesian conditions are likely the result of decreasing transmissivity due to the near surface occurrence of shales and poorly permeable sandstones in the lower reaches of Pueblo Arroyo.

The downstream impacts of the Jackpile-Paguate mine on ground water were not determined because of the absence of suitable sampling points. It is recommended that shallow monitor wells be installed at several points along the Rio Paguate to ascertain the chemical, radiochemical, and trace element species present. Limited coring in the sediment-filled Paguate reservoir would provide data on variations in the radium and uranium content before and during mining. Such data would also provide information on radioactivity associated with sediment transport during periods of peak runoff and erosion.

Significance of Radiological Data

Regulations and Guidelines

On August 14, 1975, the U.S. EPA published in the Federal Register (40 FR158, p. 34323-34328) a "Notice of Proposed Maximum Contaminant Levels for Radioactivity" to be included in 10 CFR Part 141 - Interim Primary Drinking Water Regulations. The following are the proposed maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity:

1. Combined radium-226 and radium-228 not to exceed 5 pCi/l.

2. Gross alpha particle activity (including radium-226 but exclusive of radon and uranium contents) not to exceed 15 pCi/l.

The proposed regulations also discuss maximum contaminant levels of beta particle and photon radioactivity from man-made radionuclides.

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Therefore, with respect to these proposed radioactive contaminant levels, the following conclusions were reached:

1. Additional analysis for radium-228 and lead-210 will proceed and be reported in a separate report at a later date.

2. Since radium-228 is a daughter product of thorium-232 and thorium analyses of these waters fluctuated around background concentrations, it appears that the radium-228 content should also be at background levels (i.e., less than 0.02 pCi/l. Hence, the radium-228 content, under assumed equilibrium conditions, should be less than 0.042 pCi/l, the highest reported thorium-232 content.

3. Only two locations out of the 71 ground-water locations sampled have radium-226 concentrations in excess of 5 pCi/l. Therefore, the proposed new standard of 5 pCi/l for combined radium-226 and radium-228 contents is therefore exceeded at these two locations.

4. Sixty of the 71 ground-water locations had gross alpha results in excess of the proposed 15 pCi/l limit; however, the gross alpha results reported here include uranium isotopes. Included in the list of sixty locations are several locations where the gross alpha results are less than 15 pCi/l, but consideration of the 2 sigma confidence level would then indicate a gross alpha possibly in excess of the 15 pCi/l limit.

5. The proposed maximum gross beta limit excludes naturally occurring radionuclides (e.g., lead-210); therefore, there is no presently proposed maximum contaminant level for lead-210. The NMEIA population guide MPC of 33 pCi/l appears to be the only current applicable guideline for lead-210 content.

Since the above radioactivity contaminant levels are proposed and not final interim primary drinking water regulations, the following discussions of the radiological analyses of water samples obtained during this study will be based on the U.S.P.H.S. Drinking Water Standards (1962) and current NRC/NMEIA maximum permissible concentration levels.

Radium-226

Of the 71 ground-water sampling locations of this study, only 6 locations showed radium-226 concentrations in excess of the 3.0 pCi/l drinking water standard (U.S.P.H.S. Drinking Water Standards, PHS Publication

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No. 956; 1962). The population guide--maximum permissible concentration (10CFR, Part 20, Table II, column 2, unrestricted areas) is 10 pCi/1 for radium-226. Table 7 lists the 6 locations and presents the gross alpha and radium-226 results.

The Jackpile-New Shop well, Paguate (#9232), is a potable water supply having a radium concentration in excess of the drinking water standard. This water need not be used for human consumption since other nearby wells have much lower radium concentrations (e.g., the Paguate municipal supply (#9233) or the Jackpile well (#9230)).

The Phil Harris well, Grants (#9201), is the only other potable water supply with a radium concentration in excess of 3.0 pCi/1. The Berryhill Section 5 windmill, Bluewater (#9121), is used as a stock water supply; and since there are no nearby human consumers, the radium concentration of 6.3 0.1 pCi/1 is of no immediate health hazard.

Samples from two Kerr-McGee monitoring wells (#9208 and #9213), located within 800 meters of the main tailings retention dam, contain radium in excess of 3.0 pCi/1. These wells are not fitted with pumps, are in a restricted area, and contain water otherwise unfit for comsumption. For example, TDS varies from 7500 to 8900 mg/1. Therefore, these wells do not constitute a health hazard in terms of dissolved radium. Similarly, station #9212 consists of seepage return water collected at the base of the retention dam. Aside from the radium content of 4.9 pCi/1, the water is in a restricted area, is not used for any purpose, and contains 36,000 mg/1 TDS. Therefore, consumptive use and creation of a health hazard is extremely unlikely.

For comparison purposes, Table 8 shows the radium concentrations for municipal water supplies surveyed during this study.

A radium concentration of 0.68 pCi/1 from the Erwin well north of Gallup (#9233) was the highest radium concentration for the municipal supplies. It appears that, on the whole, municipal water supplies in the Grants Mineral Belt area do not exceed 23% percent of the drinking water standard of 3.0 pCi/1.

Ten privately owned, potable water supplies were surveyed in the Murray Acres-Broadview Acres and other areas surrounding the United Nuclear-Homestate Partners mill. The highest radium concentration was 0.72 pCi/1

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Table 7

Locations with Radium-226 in Excess of the PHS Drinking Water Standard[1]

Location Description	Radium-226[2] Dissolved pCi/l	Radium-226[2] Two Sigma pCi/l	Gross Alpha[2] Dissolved pCi/l	Gross Alpha[2] Two Sigma pCi/l	Remarks
#9121-Berryhill Section 5 Bluewater	6.3	0.1	12	14	Windmill Stock Feed Water
#9201-P. Harris Grants KM-46	3.6	0.1	110	40	Potable Water Supply
#9208-KM-43 Grants	4.0	0.1	49	35	Monitor Well
#9212-KM Seepage Return-Grants	4.9	0.1	112,000	3,000	Surface Water Sample
#9213-KM-B-2 Grants	6.6	0.1	8	32	Monitor Well
#9232-Jackpile-New Shop Well Paguate	3.7	0.08	18	13	Potable Water Supply

1 PHS Drinking Water Standard, 1962, is 3.0 pCi/l for Radium-226.

2 Radium and gross alpha analysis by NEIC-Denver.

Table 8

Radium and Gross Alpha Concentrations for Municipal Water Supplies [1]

Location Description	Radium-226 Dissolved pCi/l	Radium-226 Two Sigma pCi/l	Gross Alpha Dissolved pCi/l	Gross Alpha Two Sigma pCi/l
#9112-Grants City Hall	0.42	0.02	19	13
#9116-Milan City Well #1	0.14	0.01	12	10
#9125-LDS Bluewater	0.22	0.01	8	10
#9137-Erwin Well Gallup	0.68	0.03	10	9
#9233-Municipal Well Paguate	0.18	0.02	2	4
#9141-Churchrock Village	0.12	0.01	3	7

1 Radium and gross alpha results by NEIC-Denver.

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at the Worthen well (#9107), and the lowest concentration was less than 0.05 pCi/l at the Schwagerty well (#9105). The average radium concentration for these 10 private wells was 0.26 pCi/l.

Six privately owned, potable water supplies in the Ambrosia Lake area contain 0.07 to 3.6 pCi/l. Of nine privately owned potable water supplies surveyed in the Grants-Bluewater area, the maximum radium concentration was 0.24 pCi/l. Only two privately owned wells were used solely as potable water supplies in the Gallup area. These were the Hassler (#9139) and Boardman (#9138) residences. The radium concentrations at these two locations were 0.22 and 0.64 pCi/l, respectively. The other 8 wells in the Gallup-Churchrock area were used mainly as stock water supplies and had an average radium concentration of 0.35 pCi/l.

Other Radionuclides

Table 9 entitled "Maximum Permissible Concentrations in Water" presents the unrestricted area - MPC and the population guide - MPC for selected radionuclides. The PHS Drinking Water Standard of 3 pCi/l for radium-226 is more restrictive than the population guide - MPC; therefore, the radium content evaluations were based on the 3 pCi/l drinking water standard. The other radionuclide content evaluations are based on the soluble MPC value since filtered ground-water samples were analyzed. The MPC values listed are from the NRC regulations which are also consistent with the NMEIA regulations (June 16, 1973).

Only 3 potable water supplies had complete isotopic uranium analysis - Wilcox (#9102), Enyart (#9133), and Dixie well (#9140). The highest reported results (for the Wilcox well) indicate less than 0.1%, 0.002%, and 0.06% of the population guide - MPC for uranium-234, uranium-235, and uranium-238, respectively.

Of all the potable water supplies analyzed for thorium-230, the Worthen well (#9107) had the highest concentration of 0.99 pCi/l. However, this is less than 0.15% of the population guide - MPC. The Meador well (#9113) had the highest thorium-232 content of 0.042 pCi/l and polonium-210 content of 2.3 pCi/l. These are 0.006% and 0.98% of the population guide - MPC, respectively.

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Table 9

Maximum Permissible Concentrations in Water[1]
(Above Natural Background)

Radionuclide		Appendix B Table II, Column 2 (Unrestricted Areas) pCi/l	Population Guide[2] pCi/l
^{226}Ra	Soluble	30	10[+]
	Insoluble	30,000	10,000
^{228}Ra	Soluble	30	10
	Insoluble	30,000	10,000
^{210}Po	Soluble	700	233
	Insoluble	30,000	10,000
^{210}Pb	Soluble	100	33
	Insoluble	200,000	66,667
^{230}Th	Soluble	2,000	667
	Insoluble	30,000	10,000
^{232}Th	Soluble	2,000	667
	Insoluble	40,000	13,333
^{234}U	Soluble	30,000	10,000
	Insoluble	30,000	10,000
^{235}U	Soluble	30,000	10,000
	Insoluble	30,000	10,000
^{238}U	Soluble	40,000	13,333
	Insoluble	40,000	13,333
U-Natural			
	Soluble	30,000	10,000
	Insoluble	30,000	10,000

1 10CFR-Part 20--Standards for Protection Against Radiation--U.S.N.R.C. (April 30, 1975).

2 Population Guide = 1/3 times Unrestricted Area MPC--Table II Values.

+ A maximum permissible concentration of 3.33 pCi/l for ^{226}Ra is the Handbook 69 population guide (i.e., 1/30th of the HB69 continuous occupational exposure limits).

All 6 municipal water supplies were analyzed for thorium-230, thorium-232, and polonium-210. The highest thorium-230 content was for Grants (#9112), with 0.046 pCi/l (0.007% population guide - MPC). The highest thorium-232 content was for the Churchrock Village, with 0.016 pCi/l (0.002% of the population guide - MPC). The highest polonium-210 content was for the Municipal well at Paguate (#9233) with 0.39 pCi/l (0.17% of the population guide - MPC). In summary, exclusive of the radium-226 content, the highest isotopic uranium, thorium, and polonium-210 contents for any potable water supply in the Grants Mineral Belt area is less than 1.72% of the total radionuclide population guide - MPC. Exclusive of the Kerr-McGee seepage return sample (#9212) and the Anaconda injection well sample (#9107), the Worthen private well (#9107) had the highest gross alpha result of 2500 pCi/l. This gross alpha result underestimates the U-natural content reported as 9800 pCi/l (i.e., 98% of the allowable MPC). There are other examples of inconsistencies between gross alpha and natural uranium data. For example, samples #9102 and #9113 have gross alpha results of 3 pCi/l and 31 pCi/l, respectively. Comparable U-natural contents are 49 and 56 pCi/l (less than 0.56% of the U-natural MPC). In general, it appears that the uranium isotopes represent the greatest contributor of alpha activity. Considering the total radionuclide values to be the summation of uranium isotopes, thorium-230, thorium-232, and polonium-210 concentrations, the percentage of total radionuclides compared to gross alpha ranged from 31% (#9219) to 639% (#9102), exclusive of #9132 which has an extremely large discrepancy of results. Therefore, it appears that the gross alpha determinations have underestimated the natural uranium contents. It is doubtful that the gross alpha determination can even be used as an indicator of the presence of other alpha emitters (e.g., U-natural and polonium-210). Since the gross alpha results have such large error terms, no meaningful determinations of percentage of other radionuclides to gross alpha result can be implied.

With respect to the use of 15 pCi/l gross alpha (including uranium isotopes) as a "scan level" to indicate radium contents in excess of 5 pCi/l, only 2 locations fall in this category. Location #9121 had a gross alpha of 12 ± 14 pCi/l and a radium-226 content of 6.3 ± 0.1 pCi/l. Because of the large error term in the gross alpha determination (8 ± 32 pCi/l) for location #9213, this sample would be included in the group of locations having a gross alpha

result greater than 15 pCi/1. This location had the highest radium-226 content of all the ground-water locations sampled (6.6 pCi/1). Of the 58 remaining ground-water locations with gross alpha results greater than 15 pCi/1 (range: <3 ± 13 to 2500 ± 200 pCi/1), the radium-226 contents ranged from 0.19 to 0.72 pCi/1, respectively. For ground-water samples with gross alpha greater than 15 pCi/1, the radium-226 concentration ranged from 0.06 to 6.6 pCi/1. Therefore, there appears to be no correlation between a gross alpha level of 15 pCi/1 (including uranium isotopes) and a radium-226 content of 5 pCi/1.

It is appropriate to conclude that for routine radiological monitoring of potable water supplies, isotopic uranium and thorium, polonium-210, and radium-228 analyses are not necessary. Accurate radium-226 and lead-210 analyses for each sample yield the most information for radiological evaluations of drinking water conditions.

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16. ABSTRACT Ground-water contamination from uranium mining and milling results from the infiltration of radium-bearing mine, mill, and ion-exchange plant effluents. Radium, selenium, and nitrate were of most value as indicators of contamination. In recent years, mining has increased radium in mine effluents from several picocuries/liter (pCi/l) or less, to 100-150 pCi/l. The shallow aquifer in use in the vicinity of one mill was grossly contaminated with selenium, attributable to the mill tailings. Seepage from two other mill tailings ponds averaged 674 x 10^6 liters/year and, to date, has contributed an estimated 1.1 curies of radium to ground water. At one of these, an injection well was used to dispose of over 3400 x 10^6 liters of waste from 1960-1973. The wastes have not been properly monitored and have apparently migrated to more shallow, potable aquifers. No adverse impacts on municipal water quality in Paguate, Bluewater, Grants, Milan, and Gallup were observed. No correlation was found between gross alpha greater than 15pCi/l and radium-226 in excess of 5 pCi/l. Company-sponsored monitoring and reporting programs do not describe the full impact of mining and milling operations on ground-water quality. Review by State and Federal agencies has generally been superficial. Improvements in these areas and additional ground-water sampling are recommended.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Ground water, hydrogeology, uranium, water pollution, waste disposal, injection wells, wastes, natural radioactivity, radium, radiation hazards, radioactive wastes, mining, milling, tailings ponds.	Grants Mineral Belt New Mexico Uranium mining and milling.	Radioactive contaminants, Radioactive waste processing, waste disposal.

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16. ABSTRACT

Ground water in the study area is affected by mining and waste disposal associated with mining and milling. Contamination appears in close proximity to the mining and milling centers with the exception of more widespread selenium contamination of shallow ground water adjacent to the United Nuclear-Homestake Partners Mill. Contamination of municipally operated water supplies in the study area is not evident. Potable supplies derived from mine water at four industrial sites exceed applicable limits for selenium in drinking water. Three such systems exceed limits for Radium 226.

Recommendations developed are designed to assist the State in future regulation of uranium mining and milling for the purpose of safeguarding public health and insuring future environmental quality.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Uranium Radioisotopes Ground Water Water Quality Surface Water Potable Water	BT Radioisotopes RT Aquifers; water wells; water table RT Water Pollution NT Lagoons UF Drinking Water RT Public Health	

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New Mexico Energy and Mineral Department

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INTRODUCTION

This report represents an attempt to gather as much information on the New Mexico uranium industry as possible and place it in one booklet. In order to keep the booklet to a reasonable size, much of the information has been summarized. For more complete information, the reader should refer to the source materials listed at the end of each section.

While the author has tried to make the information as accurate as possible, new data, changes in uranium company and utility growth plans, new regulations and requirements, and the fact that companies in some cases regard information as proprietary should all be considered while reading this report. Having visited the uranium mines regularly in the last year and talked with company personnel, the author is impressed with the rapid changes in company plans which occur in the mining industry. In addition complete data is often hard to obtain. For example not all companies have water flow meters at their discharge points in order to determine mine water discharge rates. There appears to be a lack of tabulation of all data from monitoring wells, etc. Point source emissions are only now beginning to be seriously studied as well as radionuclide transport in the environment. A great deal more data is needed. If the reader detects inaccurate statements, he is urged to write the author so that changes can be made in any following reports.

This report would not have been possible without the help of all the uranium industry. Tours of each mine and mill site and tours underground were especially helpful. The author wishes to express her appreciation to all the many industry personnel who answered her questions and showed her the many interesting aspects of mining and milling.

The New Mexico uranium mining industry represents an important source of revenue and jobs for the State of New Mexico. It it hoped that this booklet will aid anyone interested in that industry to obtain a better understanding and appreciation of the production of uranium in New Mexico.

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CHAPTER VI

MINING

Techniques

The first areas, in general, to be mined for uranium in New Mexico were the easily discovered ores near the surface and in outcrops. For deposits 60 feet or less below ground the barren surface material was removed. The ore removal was either in a typical pit type operation or in some cases channels which followed the ore body were excavated. If the ore body moved deeper off the pit area, adits in some cases were constructed to recover the ore. Outcrops and fairly shallow ore bodies too deep for pit mining were usually recovered using adits, inclines, or declines. When underground deposits were discovered at Ambrosia Lake, vertical shafts were sunk. Some of these shafts were wood lined. In comparison to today's maximum depths, the shafts were fairly shallow. Only small headframes (often constructed of wood) were necessary.

Though some new mines are being constructed in those areas which were productive in earlier years, the trend is for new mines to be at deeper depths. In general, these mines are also below the water table and may require a large amount of dewatering.

After development drilling has outlined the general area of the ore body, the site for the shaft (or shafts) is determined. General topography and minimizing underground ore haulage are the chief considerations in locating the shaft.

To begin a shaft the footings for the concrete collar are put in and the collar is constructed. Then the headframe is installed to allow for removal of the material from the shaft interior. To advance the shaft depth, in general, holes for blasting are drilled, the area is blasted, the loose material is hoisted, the forms for the concrete lining are put into position, and the lining increment is poured. This process is repeated until the necessary depth is reached. Power lines, and pump stations are carried downward as shaft excavation proceeds. In some cases, it may be necessary to drill dewatering wells in order to dewater the aquifers which the shaft passes through, so that shaft

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sinking can proceed. Grouting is used to seal off aquifers just before and during sinking through the aquifer. One company is considering freezing the area around the shaft before sinking the shaft in order to overcome dewatering problems. Other companies have first drilled the shaft and then enlarged it (For example, Church Rock 1E).

In wet mines, the shaft depth is usually to below the ore body in order to allow for haulage ways to be constructed below the mining area. Long hole drilling at points along the haulage ways is used to dewater the ore body.

In mines which are dry, the haulage ways are usually on the ore level.

A glossary of mining terms is included at the end of this chapter.

The Kerr-McGee Rio Puerco mine is currently under construction. The description of this mine's development taken from the Environmental Report is included to indicate the general development techniques used in developing a wet mine:

"The mine development phase consists of establishing sufficient access to the ore bodies to permit the production tonnage rate desired to be sustained. In the case of underground mining, this involves sinking a shaft which has been located so as to optimize the haulage distances from the various ore producing areas. Once the shaft is sunk to the ore depth, a station with ancillary drifts, pockets, trenches and sumps is developed.

The shaft at Rio Puerco will be 14 feet I.D., circular, concrete-lined, with two hoisting compartments. In each hoisting compartment, there will be a man cage with a three ton capacity skip suspended below it.

The time required to complete this size shaft to a depth of 850 feet will be 550 to 650 days. This includes completion of a pump station at 700 feet and the pocket and slusher trenches.

Before and during the shaft's construction, surface support facilities are also being constructed. The main pad area includes a main and auxiliary building, shaft area pad which includes a 90 foot high head frame, oil and fuel storage, power facilities area, perhaps a concrete batch plant (depending on economics of concrete delivery in the area), ore storage pad, and materials storage yard. The main building, as normally employed by Kerr-McGee, contains the hoist room, warehouse, maintenance shops, personnel shower and change rooms, and

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some engineering and administrative offices.

The area is fenced to prevent livestock entry. Inside or adjacent to the main yard area will be the topsoil stockpile, ore stockpile, water treatment facilities, and the waste rock dump. The main area to be fenced at the Rio Puerco project encompasses 72 acres.

Topsoil is removed and stacked to be used for reclamation when operations cease. The pile is seeded to prevent its erosion while stored. The ore stockpile provides surge so the mine and/or transportation system can act independently of one another.

The waste rock pile consists of barren rock produced by the shaft sinking and development headings. Attempts are made to locate this pile in an area to minimize its erosion and possible leaching by rainwater of any potential pollutants.

Total accumulation of waste rock generated by the mine project is estimated to be 370,000 tons. At the cessation of operations, some of the reserved topsoil will be placed over this pile and seeded to minimize erosion and leaching of the waste rock and to aesthetically blend it into the surrounding terrain.

The water treatment facilities are placed in a favorable gravity flow (from shaft) position with discharge access to the local drainage.

Once the shaft and surface work is completed, mine development continues with the driving of horizontal drifts outward from the shaft and beneath the elevation of the ore zone(s). These drifts are approximately 9 feet wide by 9 feet high and supported for safety purposes by rock bolts, wood sets, and/or steel sets. Haulage drifts generally parallel the long axis trend of the ore bodies. Short drifts, called crosscuts, are driven normal to the haulage drift as required to reach the extremities of the ore bodies.

These drifts are advanced by the standard drill, blast, and muck cycle. Typical development equipment includes mucking machines, jackleg drills, diesel locomotives (4 to 8 ton capacity) and 110 cubic foot rail cars which travel on 36 inch gauge track. Haulage drifts may also be excavated by mechanical mining machines such as the Alpine Miner. Haulage drifts are driven on a positive ½ to 1% grade to favor loaded trains and provide drainage toward the shaft.

As the drifts extend farther away from the shaft, the ventilation system is also developed by drilling ventilation holes. Their posi-

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tions are based on the location of the ore bodies, and, of course, consistent with the overall plan of mining.

The holes are bored by a surface rig. Two methods are employed. One, the rig bores down on a pilot hole; or, two, the bit is attached at the bottom of a pilot hole and the hole reamed upward. This work is done by a Division of Kerr-McGee Nuclear or a contractor. The holes are usually 48 to 60 inches I.D. cased with a steel liner which is cement grouted. Larger holes may be employed for deeper mines.

These holes are normally used for exhaust with the fresh air intake being the production shaft. By strategic placement of these holes, the ventilation system underground is able to maintain air quality (particularly for radiation standards) as required by Federal and State mine safety regulations.

Surface acreage required for each hole is minimal. Four acres are needed as a pad area while the hole is being drilled. After completion, approximately 3½ acres are reclaimed leaving a ½ acre plot fenced around the vent hole and its fan installation.

Ore bodies are entered through raises driven from the haulage or crosscut drifts. In general, separate raises are driven for manways, ore passes, and service raises either through the conventional drill/blast cycle or with the use of raise boring machines. From the haulage drifts, rotary longholes are drilled up to delineate the ore bodies for purposes of planning the raises.

Development in the ore horizon is accomplished by driving 5' x 6' subdrifts within the ore. Initial development is followed by extensive longhole drilling laterally and vertically from the subdrift headings. Length of these longholes normally does not exceed 40 feet. If sufficient ore is located by longhole drilling programs, development drifting will resume. Advance of such headings is through conventional drilling and blasting and the muck is handled from the face to the muck raise by the use of 25 or 30 horsepower 3-drum electric slushers.

At this point, an ore body's development phase is essentially complete.

As development of ore bodies nearest the shaft are completed and they go into production, the development of more distant ore bodies continues. Thus, the transition from all development to a production status is gradual with some development continuing almost the entire

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span of the project. It is apparent the development drifting in the ore bodies produces some ore, and that can be said to also be the initial production. It is currently Kerr-McGee's intention to produce 510 tons/day maximum. Starting from shaft collar construction, it will take approximately four years for the mine to reach full production.

Extraction (called "stoping") of an ore body begins once development is complete. Generally, there are three stoping methods employed by Kerr-McGee: (1) open stopes; (2) room and pillar stopes; (3) square set stoping. The object of each method is to extract as much of the ore (material defined as being above a certain minimum assay) as possible. These methods normally allow recovery in excess of 90% of the ore available. Thus, maximization of a natural resource use is accomplished while simultaneously maximizing the project's profitability.

The stopes final configurations are based on several factors such as the ore body's shape, ground control in the stope, ventilation limitations, and roof control in the stope. Roof bolts, stulls, cribbing, timbering, and sandfill are variously applied as required. Sub ore-grade mineralized areas may be utilized as pillars for support where they occur.

Open stoping is employed in smaller ore bodies with roof bolts and cribbing being mainly employed for roof control. Larger ore bodies of a more continuous nature will be extracted using the room and pillar method. After the development drifts (rooms) are driven, pillar robbing begins at the furthest limit and the robbing activity retreats back to the raise. Slushers used in this phase are 30 to 75 H.P., 3-drum type.

Square set stoping is employed where the ore is continuous and of greater thickness. This is done to assure both adequate roof support and high extraction rates. The sill sets are nominally 8 feet in height with the "mining floors" (upper tiers) nominally constructed 6 feet in height. Final stabilization of a square set stope may be accomplished by sandfilling once ore removal is complete.

The maximum tonnage rate will tail off as stoping is completed. At some point, ore depletion causes the project to become unprofitable at which point the decision is made to cease operations.

This results in closure procedures being put into effect. Valuable equipment and other salvagable materials are stripped from the mine. Then, a concrete plug will be poured at the collar of the shaft

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to seal the mine from unauthorized or accidental entry by man or animals.

The area of the ore stockpile will be thoroughly cleaned and the material sent to the mill. Trash and nonsalvagable material will be buried. The hoist headframe, buildings, and other structures will be removed. At the request of the surface owner(s), some buildings may be left intact for the owner to put to some other beneficial use.

Any foundations left from the structures removed will be destroyed. The areas disturbed will be graded and the topsoil will be redistributed. Seeding of the relaid topsoil will be done on the same basis with the same seed types as described in the section on exploration reclamation.

Roads will be scarified and reclaimed if the surface owner does not want them for his use."

Very few New Mexico mines use mechanical miners. Most mines are too small to justify the expense, and the ore bodies are so irregular that the machines can only be used for driving haulageways, etc. The sandstone also causes high maintenance costs. UNC's Church Rock mine does use Doscos. A Dosco is in use at Sec. 13 and a Dosco may be used at Gulf's Mount Taylor mine for development work there. An Alpine F6-A has been used by Kerr-McGee at their Ambrosia Lake mines and an Alpine has been used by Anaconda.

The new deeper mines are going to the use of shaft ventilation rather than ventilation via boreholes because of the reduced energy requirements with the larger shaft areas. The deep mines (3,000 feet) will also use air cooling equipment in order to keep the temperatures down to temperatures at which miners can work. (The temperature of the rock face at Mount Taylor will be about 130°F).

Some of the operators, at mines which are being sunk very deep, have indicated that they feel that the shaft dewatering wells have aided more than grouting in controlling water infiltration. Selection of the proper grout is very critical. Depending on the success of shaft freezing, future deep mines may incorporate dewatering wells as normal operations in shaft sinking.

Several mines in New Mexico have received or are receiving sand back fill The status of sand backfill in New Mexico is given in Table VI-1. As was mentioned in the Rio Puerco discussion, sand back-

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fill is usually used for structural support. The sand may be wind blown sand or sand recovered from milling operations.

Currently, Kerr-McGee is recovering sands off the cyclones in the sand-slimes separation circuit of the mill. These sands are used at Kerr-McGee's Section 35 and 36 mines and at Rancher's Johnny M Mine. Presently, about 1,000 tons a day are being used at 35 and 36. This sand is stored in the mill area and is transported to the mines by truck. In the mined out area of the mine, a bulkhead is constructed. The sand is mixed with water (50-50 Ranchers and 70-30 at Kerr-McGee) and is slurried from the surface to the top of the bulkhead. The sand is then deposited in the open area behind the bulkhead. The water drains from the sands into sumps where it is pumped to the surface. Once the sands are drained further stoping in front of the bulkhead can begin. Over 100 tons an hour of sand can be emplaced in each of the current operations.

This sand backfill technique if successfully used allows for almost complete ore recovery in thick beds without mine collapse causing inter-aquifer connections.

In December of 1977 sand backfilling was not successfully used to prevent collapse, and in Section 35 a connection was made from the Westwater, in which the mining was being conducted, and the Dakota which is above the Westwater. Mine dewatering rates increased by a factor of approximately two until the area was sealed off.

Another mining technique in use today in "worked out areas" is mine water recirculation. In the early years of mining cutoff grade was usually about .15% U_3O_8. As retreat began in these mines, the roof collapsed. When this happens further ore recovery using traditional techniques is difficult. To further increase recovery, many mine owners have drilled holes to the top of the collapsed zone and are spraying water through these holes onto the low grade shattered ore. Mine water is slightly alkaline and a small amount of leaching occurs as the water runs through the shattered zone into collection sumps. The enriched water is then pumped to central ion exchange facilities where the uranium is removed from the water. The water, allowing for discharge of any excess, can then be returned for further leaching. After a period of time no further leaching may occur. Then the shattered zone is allowed to "sit" until further oxidation of the ore via natural processes occurs (usually about two weeks).

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TABLE VI-1

SAND BACKFILLING IN NEW MEXICO MINES

Company	Mine or Proposed Mine	Has Had BackFill	Will Have BackFill
UN-HP	Ambrosia Lake Mines	yes	N/A
Ray Williams	Enos Johnson	yes	no
Mobil	Crownpoint*	-	yes
Kerr-McGee	Section 17	no	if necessary
Kerr-McGee	Section 19	no	if necessary
Kerr-McGee	Section 22	yes	yes
Kerr-McGee	Section 24	no	if necessary
Kerr-McGee	Section 30	yes	yes
Kerr-McGee	Section 30 W	no	if necessary
Kerr-McGee	Section 33	no	if necessary
Kerr-McGee	Section 35	yes	yes
Kerr-McGee	Section [illegible]	yes	yes
Kerr-McGee	Church Rock #1	no	if necessary
Ranchers	Johnny M	yes	yes
Gulf	Mount Taylor*	-	yes
Kerr-McGee	Rio Puerco*	-	if necessary
Cobb	Section 12	yes	yes
Conoco	Bernabe*	N/A	N/A
Conoco	Crownpoint*	N/A	N/A
UNC	Dalton Pass*, Sec. 30* Sec. 34*	-	waste rock if necessary
UNC	Church Rock	N/A	undergoing study
UNC	Sandstone	N/A	N/A
UNC	Ann Lee	N/A	N/A

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TABLE VI-1 (cont)

Company	Mine or Proposed Mine	Has Had BackFill	Will Have BackFill
UNC	Section 27 E	N/A	N/A
Gulf	Mariano Lake	no	may have waste
Ranchers	Hope	N/A	N/A
Phillips	Nose Rock*	-	yes
UNC	St. Anthony*	N/A	N/A
Kerr-McGee	Church Rock #2*	-	if necessary
Calumet & Helcla, Inc.	Marquez (inactive)	yes (blow sand)	

*under construction or planned

Mines undergoing mine water recirculation are shown in Table VI-2.

Mine dewatering water is also run through the ion exchange plant in many cases in order to recover the uranium. While the amount of uranium produced from mine waters was rather small in 1977 (less than 100 tons U_3O_8) this extraction process is cheap and hence represents a small profitable operation for the mine owners.

Another type of uranium recovery technique is to use an in-situ method. In a project currently being tested in New Mexico by Mobil near Crownpoint injection wells are drilled in a five spot pattern 100 feet apart. Weak alkaline solutions containing an oxidant will be injected in the four outer wells and the leached solution will be recovered in the center well. The pregnant leachate will next be passed through an ion exchange column containing resin. The uranium will then be removed from the resin in another column, precipitated, and dried. In order to contain the leachate and to have a successful operation (1) the ore zone must be saturated, (2) there must be a net production of water, (3) the ore body must be uniformly permeable, and (4) it is helpful to have impermeable material overlying and underlying the ore bearing unit. Figure VI-1 illustrates the major aspects of this type of extraction technique. The present New Mexico project is designed to recover uranium from nearly 2000 feet and if successful, will be a first for this depth.

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TABLE VI-2

MINE WATER RECIRCULATION

Company	Mine	Is Undergoing Recirculation	Will Undergo Recirculation
UNC	Ann Lee	yes	
UNC	Section 27 E	yes	
UNC	Sandstone	yes	
Kerr-McGee	Section 17	yes	
Kerr-McGee	Section 22	yes	
Kerr-McGee	Section 24	yes	
Kerr-McCee	Section 30	yes	
Kerr-McGee	Section 30 W	yes	
Kerr-McGee	Section 33	yes	
Kerr-McGee	Section 19		yes
Kerr-McGee	Section 35	to slurry sands	
Kerr-McGee	Section 36	to slurry sands	
UN-HP	Section 23	yes	
UN-HP	Section 25	yes	
Ranchers	Johnny M	to slurry sands	

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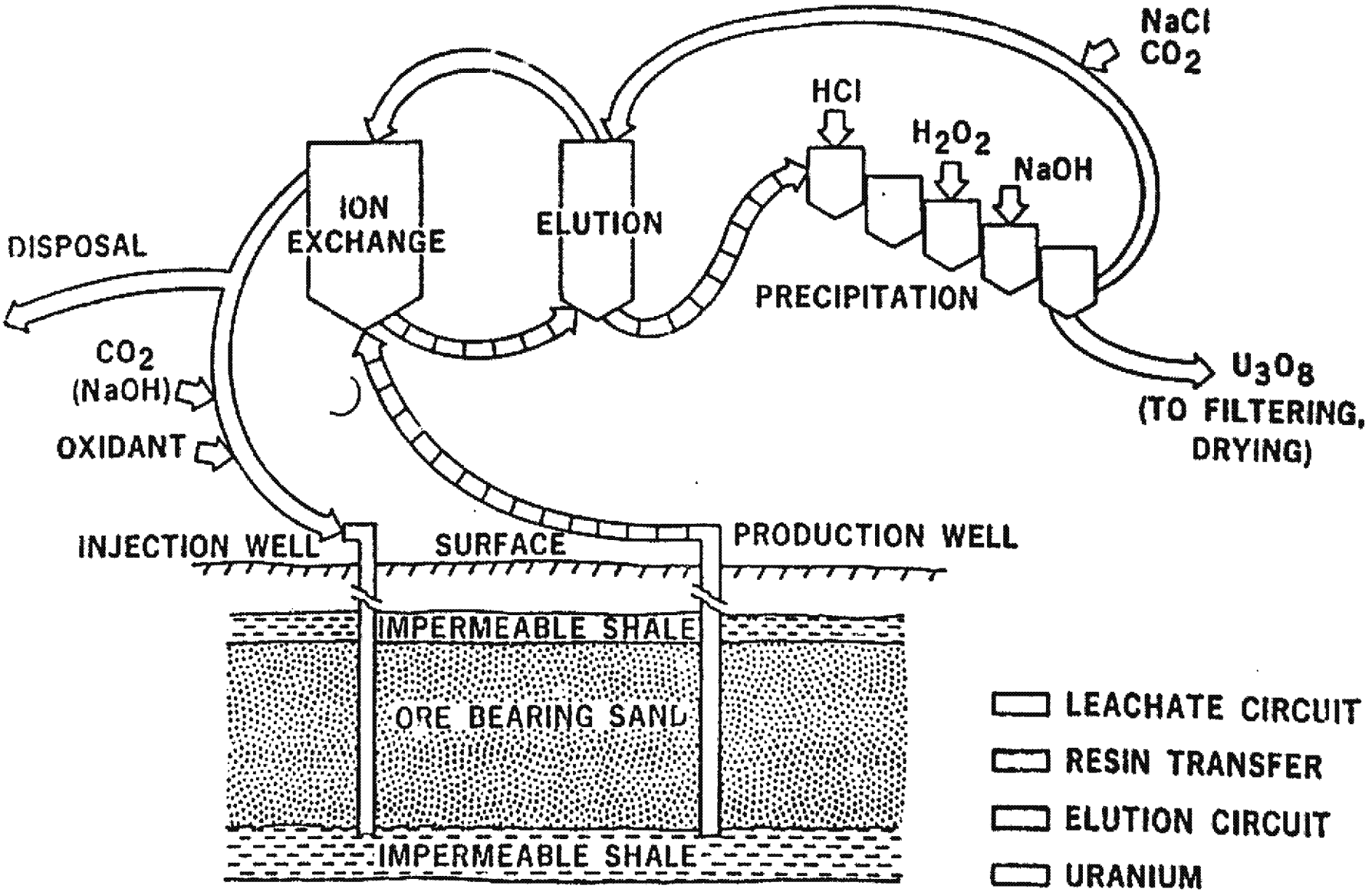
FIGURE VI-1

IN-SITU URANIUM LEACHING PROCESS



Source: Mobil

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Companies having IX plants to recover uranium from mine water dewatering, mine water recirculation, and in-situ leach projects are listed in Table VI-3.

Heap leaching is also a uranium recovery method which has been employed in New Mexico. In this type of operation the ore is piled in heaps above drain tiles. A suitable solution is applied to the heaps. The solution runs through the ore and is collected in the drains. The uranium is then extracted from the pregnant liquor and the solution recycled.

Kerr-McGee use to have a small heap leach operation near their tailings pond and UNC has an abandoned operation in front of the San Mateo mine. UNC plans to operate a pilot plant leach operation for low grade ore (about .01%-.03% U_3O_8) on their Ambrosia Lake property. The pregnant liquor will go to their present IX plant. Union Carbide is studying the feasibility of heap leach if they develop their Diamond Tail property.

Inactive Mines in New Mexico

It is not known how many inactive mines are located in New Mexico. Lowell Hilpert states in the Geological Survey Professional Paper 603 that production in northwestern New Mexico from 1950-1964 came from 175 mines. It would be assumed that some mines developed after 1964 may be inactive while several mines developed before 1964 continue to be active or have been reopened.

Table VI-4 is a list of some of the mines no longer in operation. This data was obtained from the State Mine Inspector. Only a few of the mines have been field checked as to location by the Energy and Minerals Staff. The field survey program at the present time has failed to locate two mines in their stated locations and located one mine not listed in the table. Several of the larger mines which have been located in the present field survey will be described below.

Church Rock Area

The Church Rock Mine is located in T 16N R16W Section 17. It was mined in both the Dakota and Westwater from a vertical shaft during 1960-1962 by the Phillips Petroleum Company. United Nuclear plans to

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TABLE VI-3

URANIUM IX PLANTS IN NEW MEXICO

Company	Location
UNC	Church Rock (Mine)
UNC	Ambrosia Lake (Mines)
UN-HP	Ambrosia Lake (Mines)
Kerr-McGee	Ambrosia Lake (Sec. 35)
Kerr-McGee	Ambrosia Lake (Western section of mines)
UN-HP	Milan (mill-tailings pond recirculation)
Mobil*	Crownpoint (In-situ project)
Gulf±	Mariano Lake (Mine)
Gulf**	Mt. Taylor (Mine)
UNC***	Old Church Rock (Mine)

*Mobil has not yet begun uranium recovery but the skid mounted unit is on the property. (November, 1978)

±Will start-up in Spring 1979

**Will be operated when mine production begins, probably late 1979

***Will be installed soon

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TABLE VI-4

Inactive New Mexico Uranium Mines
Location Grants to Ambrosia Lake

Mine	Company	Township & Range	Area
Barbara #3	Bailey & Fife	T13N R9W Sec. 30	Poison Canyon
Beacon Hill Incline	Farris	T13N R9W Sec. 20	Poison Canyon
Blue Peak	Garcia	T13N R10W Sec. 24	Poison Canyon
Buckey #1	(See-Tee)	T14N R10W Sec. 14	Near Kerr-McGee mill~2½ miles
Sec 4 Dakota Mine	Farris	T13N R10W Sec. 4	NE of Haystack Mt. (Goat Mt. Quad.)
Dalco #1	Dalco	T13N R9W Sec. 30	Poison Canyon
Davenport	Black Rock	T13N R9W Sec. 20	Poison Canyon
Dog Mine	Four Corners Ex.	T13N R9W Sec. 20	Poison Canyon
Flea Mine	Four Corners Ex.	T13N R9W Sec. 20	Poison Canyon
Mesa Top	(See-Tee)	T13N R9W Sec. 20	Poison Canyon
Doris Incline	Bailey & Fife	T13N R9W Sec. 21	NE of Poison Canyon
Doris #2	KSN (Phillips)	T13N R9W Sec. 21	NE of Poison Canyon
Westvaco	SFRR	T13N R9W Sec. 29	Poison Canyon
Dysart #1	UNC	T14N R10W Sec. 11	~3½ miles N of Kerr-McGee Mill
Dysart #2 (SE Shaft)	UNC	T14N R10W Sec. 11	~3½ miles N of Kerr-McGee Mill
Dysart #3 Mary #1	Homestake-Sapin	T14N R10W Sec. 11	~4 miles N of Kerr-McGee Mill
Stella Dysart #12	(See-Tee Mining)	T14N R10W Sec. 20	N of Haystack (Goat Mt. Quad)
Faith	KSN	T13N R9W Sec. 29	Poison Canyon
Farris	Farris	T13N R9W Sec. 33	E of Poison Canyon
Flat Top	Bailey & Fife	T13N R9W Sec. 30	Poison Canyon

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TABLE VI-4 (continued)
Grants to Ambrosia Lake

Francis Mine	Farris	T14N R11W Sec. 8	North of Haystack (Goat Mt.)
Glenn & Edith	Federal Uranium	T13N R11W Sec. 24	South of Haystack
Gossett	Farris	T13N R9W Sec. 18	Poison Canyon
H-H-50 Roundy	Bailey & Fife	T13N R9W Sec. 30	Poison Canyon
Homer Scriven	Mesa	T13N R10W Sec. 36	SW of Poison Canyon
Hanosh	Hanosh	T12N R10W Sec. 26	
Haystack #2	B & H Trucking	T13N R11W Sec. 13	Haystack
Hogan	Four Corners	T13N R9W Sec. 14	Off San Mateo Road past Ambrosia Lake "Y"
Ike #1	Rio De Oro	T14N R9W Sec. 26	West of Kerr-McGee
Isabella	KSN	T13N R9W Sec. 6 & 7	South of Kerr-McGee Mill
Kermac Sec. 10	Kermac	T14N R10W Sec. 10	West of drylake called Ambrosia Lake
Marquez	Kerr-McGee	T13N R9W Sec. 23	Off San Mateo Road to South past "Y"
No. 4 Moe	Sutton	T13N R9W Sec. 32	East of Posion Canyon
Chill Wills	Farris	T13N R9W Sec. 24	Off San Mateo Road to South past "Y"
Rimrock	Sutton	T13N R10W Sec. 36	SW of Poison Canyon
Rimrock (pit) Q-32 T-9	Bailey & Fife	T13N R9W Sec. 30	Poison Canyon
Federal Mine Sec. 18	Mesa (Cibola)	T13N R10W Sec. 18	Haystack Mt.
Section 19 (pit)	UNC	T13N R10W Sec. 19	South of Haystack
Haystack Sec. 23	Dole	T13N R10W Sec. 23	Between Haystack Poison Canyon
Sec. 25 Haystack	Farris	T13N R10W Sec. 25	Between Haystack Poison Canyon

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TABLE VI-4 (continued)
Grants to Ambrosia Lake

Sec. 31 Haystack	SF Pacific RR UNC	T13N R9W Sec. 31	South of Poison Canyon
Silver Spur	Farris	T14N R10W Sec. 31	North of Haystack (Goat Mt.)
Vallejo	Penta	T13N R9W Sec. 34	East of Poison Canyon
Black Hawk & Bunny	Bailey & Fife	T12N R9W Sec. 4	SE of Poison Canyon
Bonanza #1	Trust Co.	T12N R9W Sec. 11	La Jara Mesa
F-33	Homestake	T12N R9W Sec. 33 & 34	East Grants Ridge
Falcon #1	Falcon	T11N R9W Sec. 20	NE of Grants ~ 22 Miles
Zia La Jara	Anaconda?	T12N R9W Sec. 15	North of Grants near La Jara Mesa
Section 9 (strip)	Anaconda	T12N R9W Sec. 4 & 9	Near La Jara Mesa
Red Bluff 8 & 10	Cheyenne	T12N R9W Sec. 4	
San Mateo	UNC	T13N R8W Sec. 30	About 4 miles west of San Mateo

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Location: Laguna-Marquez

Mine	Company	Township & Range	Area
Alpine Miner	Anaconda	T10N R5W Sec. 2	South of Paguate
Jackpile underground H-1	Anaconda	T10N R5W Sec. 3	near Paguate
M-6	St Anthony	T11N R4W Sec. 30	North of Jackpile
South Laguna	Anaconda	T9N R5W Sec. 22, 27 T8N R5W Sec. 7, 8	South of Jackpile
Woodrow Mine	Anaconda	T10N R5W Sec. 1 T11N R5W Sec. 36	East of Paguate

Location: Smith Lake

Alta Group	Fay & Company (Farris)	T14N R11W Sec. 5 & 6	8MN Prewitt
Black Jack #1	UNC	T15N R13W Sec. 12	West of Smith Lake
Black Jack #2	UNC	T15N R13W Sec. 18	West of Smith Lake
Mac #1	UN-HP	T15N R14W Sec. 12	South of Mariano Lake
Mac #2	UN-HP	T15N R13W Sec. 18	West of Smith Lake
Silver Bit	United Western	T14N R12W Sec. 10	Near San Antonio

Location: Church Rock-Gallup

Secenti	WCT Engineering	T15N R17W Sec. 28	South of Rehoboth
Church Rock	UNC	T16N R16W Sec. 17	Near Springstead
Foutz #2	Four Corners Uranium	T15N R16W Sec. 5	North of Wingate
Hogback #4	Windsor	T15N R18W Sec. 12	North of Gallup
Largo #2	Largo Uranium	T15N R17W Sec. 33	South of Rehoboth
Diamond #2	Jamieson	T15N R17W Sec. 28 & 33	

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Location: Church Rock-Gallup (cont)

Mine	Company	Township & Range	Area
Rimrock #1	MP Grace	T15N R16W Sec. 3	North of Wingate area
Rimrock #2 Williams & Mary	MP Grace	T15N R16W Sec. 4	North of Wingate area

Location: Other

Junio	Robert B. Daniel	T9N R1W	15 miles North Albuquerque
Datil	Farris (Ranchers)	T2N R10W Sec. 19	
Quary	Mandeville Mining	T8S R17W Sec. 27	
Begay #2	Fritz-Erickson	T29N R21W Sec. 24	
King Tutt	Sylvania	T29N R21W Sec. 24	
Nelson Point	Foote Mineral	T29N R21W	

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reopen this mine in the near future. UNC has reported that the old low grade ore surrounding the mine was sent to the mill for recovery.

Smith Lake Area

Black Jack #1 (T15N R13W Section 12) was mined by UNC via an 825' foot shaft during 1959-1964. The ore was located in the upper half of the Westwater. Old buildings and foundations remain at the site. Old ore storage areas and mine waste dumps give gamma readings in excess of background. The shaft has been covered with a cement cover.

Black Jack #2 (T15N R13W Section 18) was operated by UNC and began production in 1960. The ore is located in the Brushy Basin member of the Morrison Formation. One building is presently standing. The main ventilation shaft is open and this area has collapsed. Another ventilation hole near the building is open. The shaft has a concrete slab across it. Gamma levels in excess of background occur around the mine area. Transport of waste piles and old ore storage areas by rain runoff is apparent. This mine may be reopened as a joint venture by Cobb Nuclear and Anschutz.

Mac #1 (T15N R14W Section 12) was operated by UN-HP. Two buildings remain at the site. The shaft has been covered by a concrete slab. Waste piles give gamma readings in excess of background. The mine waste is moving both via water and air transport.

Mac #2 (T15N R13W Section 18) was also operated by UN-HP. This was apparently a rather small facility. The shaft has been covered with a concrete slab. Waste piles surrounding the shaft have external gamma levels above natural background.

Poison Canyon Area

The F-33 mine is located in T12N R9W Section 33 and Section 34 at the base of the East Grants Ridge. The mine was worked via two declines. Anaconda was operating the mine when it was closed in 1976. The ore was removed from the Todilto Limestone. There are waste benches at the entries. Two of the entries are open except for wire mesh. The waste benches have higher gamma levels than surrounding natural soils. The south bench gives higher levels than the north bench.

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Along the Todilto Limestone bench north of F-33 and on the east of the San Mateo drainage there are a series of pit, extended pit, and adit mines. These include Zia (T12N R9W Section 15) and in T12N R9W Section 4 and 9 Christmas Day #1, Black Hawk/Bunny, Red Bluff, Gray Eagle, UDC Section 4, Vallejo, Anaconda Section 9, and Last Chance. These mines operated during the 1950's and early 1960's. No land restoration has been undertaken and the limestone bench in this area is covered with pits and/or waste materials. Waste is beginning to wash into the valley below. Gamma levels of the mine waste while not as high as many mine wastes in New Mexico, are above background.

Another long bench of Todilto Limestone runs west-east in the Poison Canyon area. This area also contains pits, extended pits, and adits. Little restoration has been done in this land area which includes T13N R9W Section 31 and Section 30, and T13N R10W Section 25, Section 26, Section 23, Section 16, Section 18, Section 19, and T13N R11W Section 24 and Section 13. The mines include Haystack 31, Rimrock, Haystack 25, Section 19, Hanosh, Haystack 23, Red Point #1, Haystack 1 and 2, Glenn and Edith, Federal, and Section 19. These mines were active in the 1950's and early 1960's. Waste material has gamma levels above background. Ore recovery was from the Todilto Limestone.

Moving inward from the Todilto Limestone bench are several shaft mines. Flat Top is located in T13N R9W Section 30 and was operated during the 1960's. The shaft entry has logs across and a small concrete slab. An unlocked door gives access to the mine via a ladder. Waste piles having gamma levels above background are around the shaft area.

A mine whose name is not known is located in T13N R10W Section 24. The headframe is still standing and the shaft has a ladder down it. Open vent holes and gamma levels above background were noted in the area.

The Westvaco (Faith) apparently extended down to 450 feet in T13N R9W Section 29. The entry has caved into a large hole in the ground. Ore material giving gamma levels approximately 50 times background was falling into the nearby arroyo.

The Roundy, (T13N R9W Section 30), Barbara J. #1 (T13N R9W Section 30), the Barbara J. #2 (T13N R9W Section 30), and the Barbara J. #3 (T13N R9W Section 30) were mined in the 1950's and 1960's. Open vents

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and mine wastes were also noted in the areas of these mines. The new Todilto mine will connect to the Roundy mine and Barbara J. #2 mine.

San Mateo

The Marquez mine (T13N R9W Section 23) was operated in 1958-1965 by United Nuclear. The entry, a decline, is presently closed with wire mesh. An extensive waste bench extends out from the entry. Gamma activity levels on the bench are up to 50 times background. The road to the mine also has gamma levels in excess of background. Ore recovery was from the Brushy Basin and mining problems were encountered.

The San Mateo mine (T13N R8W Section 30) was operated by UNC. Mining problems were experienced due to the swelling of clays in the Brushy Basin member of the Morrison. The ore was removed via a shaft which is presently covered. Building foundations and general debris such as water heaters, ducts, etc., remain at the site. A bench of about 10 acres extends outward from the mine area. This bench is about 100 feet at its face above the valley floor. The bench material is beginning to move towards the valley floor. Gamma activities on the bench are in excess of background. In front of the mine towards San Mateo Creek is a heap leach pad consisting of two cells covering an area of .34 acres. Again gamma levels are in excess of background. This mine may be reopened by UNC.

Chill Wills (T13N R9W Section 24) was operated in the 1960's. Piles of waste surround the mine.

Hogan (T13N R9W Section 14) was operated between 1959-1962. The shaft is covered with a concrete slab, but there are two holes in the very weathered slab. Piles of random waste are around the site.

Ambrosia Lake

Spencer Shaft (T13N R9W Section 8) is a wood cribbed shaft. It is being reopened by Koppen. Koppen also hopes to reopen at least part of the Isabella (T13N R9W Section 6 and 7).

The Rio Del Oro (Dysart #1) is located in T14N R10W Section 11. It was an early underground mine about 300 feet deep. Approximately 900,000 tons of .21% grade ore was removed (max. 1500 T/day) from the Westwater during 1956-1962. The headframe and hoist building are still standing.

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The Mary #1 (T14N R10W Section 11) as of April 1978 still had its headframe standing. However, it was reported to be dangerous to go near as the whole area was in danger of collapse. Mary was operated by Homestake in 1959-1965.

The Dysart #2 (T14N R10W Section 11) was active from 1959-1963. At the present time Cobb is using the shaft as a vent hole for their Section 12 mine. The low grade ore piles surrounding the site give gamma levels approximately 50 times background.

Buckey (T14N R10W Section 14) was operated by See-Tee in 1957-1965. The shaft is wood cribbed. The headrame is in place; however, the shaft, though surrounded by a fence, is open. An open vent hole is nearby. Readings taken of gamma levels gave levels greatly in access of background for a large area around the mine.

Santa Fe County

The La Bajada mine (T15N R7E Section 9) had uranium removed from a pit near the diverted Santa Fe river in the 1960's. Though the pit is now flooded, Lone Star Mining has indicated that it might be interested in reopening the mine. Piles of waste having levels of radioactivity of up to 40 times natural background are located along the river on both sides of the pit. These waste piles have very little vegetation on them, and surface water run off is carrying the material in these piles towards the river.

Active Mines

There are presently 32 mines in active ore production in New Mexico. Two mines are undergoing mine water recirculation only. Data on these mines is given in Table VI-5

The active mining regions can be divided up into several general areas. Beginning from West to East there is first the Springstead (Church Rock) area. This region is about 10 miles north of Church Rock or about 15 miles northeast of Gallup. In this area are located the Church Rock mines of UNC and Kerr-McGee and the old Church Rock mine. Moving east is the Smith Lake region. Smith Lake is approximately 14 miles northeast of Thoreau. In this region are Mariano Lake, Ruby #1, and Westranch. North from Smith Lake about 10 miles is Crownpoint. In this general area is the Dalton Pass, the Borrego Pass, Nose Rock, the

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ACTIVE NEW MEXICO MINES - 1978 - TABLE VI -5

NAME	COMPANY	LOCATION	TYPE	EMPLOYMENT	MAXIMUM DEPTH FEET	NO. EXHAUST VENTS	MINE PRESSURE	AIR DISCHARGE ACFM	GPM MINE WATER PUMPED OUT	MINING TECHNIQUE
Section 22	Kerr-McGee	T14N R10W Section 22	vertical shaft (v.s.)	-	827	-	-	-		mine water recirculation only
Section 33	Kerr-McGee	T14N R9W Section 33	vertical shaft	-	848	-				mine water recirculation only
Section 30	Kerr-McGee	T14N R9W Section 30	v.s.	185	750	11	neg.	348,500		MR & P
Section 24	Kerr-McGee	T14N R10W Section 24	v.s. 9' x 16'	66	837	8	neg.	170,000	2500	MR & P
Section 17	Kerr-McGee	T14N R9W Section 17	v.s.	95	1,094	11	neg.	250,000		
Section 30W	Kerr-McGee	T14N R9W Section 30	v.s. 152" ID	184	810	4	neg.	265,000		MR & P
Section 19	Kerr-McGee	T14N R9W Sec. 19		150	779	6	neg.	205,000		
Section 35	Kerr-McGee	T14N R9W Sec. 35	v.s. 14' dia	210	1,398	6	neg.	414,000	1600	
Section 36	Kerr-McGee	T14N R9W Sec. 36	v.s. 14' dia	147	1,4[illegible]	4	push-pull	190,900	1600	
Church Rock #1	Kerr-McGee	T17N R16W Sec. 35	v.s. 14 dia.	319	1,851	4	neg.	392,000	3200-4000	R & P
Ann Lee	UNC	T14N R9W Sec. 28	v.s.	9	720	2	neg.	80,000	350-400	MR & P
Section 27	UNC	T14N R9W Sec. 27	v.s. two shafts 60" ID	39	850	3	neg.	166,000		
Sandstone (John Billy Shaft)	UNC	T14N R9W Sec. 34	v.s. 12' dia John Billy 60" ID	120	940	3	neg.	230,000	350	

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(John Baby Shaft)

48' ID

ACTIVE NEW MEXICO MINES - 1978 - TABLE VI-5
(Cont.)

NAME	COMPANY	LOCATION	TYPE	EMPLOYMENT	MAXIMUM DEPTH FEET	NO. EXHAUST VENTS	MINE PRESSURE	AIR DISCHARGE ACFM	GPM MINE WATER PUMPED OUT	MINING TECHNIQUE
Church Rock	UNC	T17N R16W Sec. 35	v.s. two shafts 14' dia 12' dia	540	1800	5	neg.	667,500	~1300-1400	
St. Anthony	UNC	T11N R4W Sec. 19 & 30	pit-one active one inactive		~150-200	-	-	-	20-50	pit
Section 25	UN-HP	T14N R10W Sec. 25	v.s. 132" x 168"	100	811	7	neg.	291,500	1800-2000	MR & P
Section 23	UN-HP	T14N R10W Sec. 23	v.s. 14 feet	163	850	12	neg.	500,000		MR & P
Section 32	UN-HP	T14N R9W Sec. 32	v.s. 47' x 11.4'	22	595	3	neg.	81,000		MR & P
Section 15	UN-HP	T14N R10W Sec. 15	shaft - (inoperative) decline	21	623	4	positive	251,580	dry at moment	MR & P
Section 13	UN-HP	T14N R10W Sec. 13	v.s. 12' 8" dia.	40	618	1	neg.	145,000	dry	
Johnny M	Ranchers Exploration	T13N R8W Sec. 7 & 18	v.s. 14' dia.	180	1380	2	neg.	140,000	1000	backfill
Hope	Ranchers Exploration	T13N R10W Sec. 19	v.s. 8' dia.	33	400	1	neg.	48,000	almost dry	trackless MR & P
Poison Canyon (connects to Gosset)	Reserve Oil & Min.	T13N R9W Sec. 19	adit 3500' long 9' x 9'	29	200 below cliff	5	neg.	63,945	dry	MR & P
Section 12 (connects to Dysart #2)	Cobb	T14N R10W Sec. 12	v.s. 14' ID	33	665	1	neg.	64,000	dry	
Westranch (portal Sec. 33)	Cobb	T15N R11W Sec. 32	Shaft-inactive decline 800' long 20°grade	14	-	1	neg.	8,000	dry	MR & P

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ACTIVE NEW MEXICO MINES - 1978 - TABLE VI-5
(Cont.)

NAME	COMPANY	LOCATION	TYPE	EMPLOYMENT	MAXIMUM DEPTH FEET	NO. EXHAUST VENTS	MINE PRESSURE	AIR DISCHARGE ACFM	GPM MINE WATER PUMPED OUT	MINING TECHNIQUE
Ruby #1	Western Nuclear	T15N R13W Sec. 21	decline 9' x 14' 2,134' 11% grade	54	386	3	neg.	361,000	dry	MR & P
Mariano Lake	Gulf	T15N R14W Sec. 12	v.s. 5' x 16'	150	519	1	neg.	83,000	200-300	MR & P
JJ #1	Sohio	T11N R5W Sec. 13	v.s. 14'	120	67.	3	neg.	200,000	25	trackless and sublind stoping
P-10	Anaconda	T10N R5W Sec. 4	decline 9' x 16' 13% grade	188	450	7	push-pull	335,000	~ 150	MR & P
Jackpile-Paguate	Anaconda	T11N R4W Sec. 33, 34, 35 T10N R4W Sec. 2,4, & 5	pit	~ 435	pits - 150				dry	pits - over 2000 acres now disturbed
Haystack	Todilto Exp. & Develop. Corp.	T13N R10W Sec. 19	pits and adits	14	150	1	neg.	16,000	dry	pits and MR & P
Spencer Shaft	Koppen	T13N R9W Sec. 8	v.s.	12	300			N.A.	dry	
Enos Johnson	Ray Williams	9 N W Sanostee Boarding School	adit 4000' in	4	-	1		28,000	dry	
Sec. 21 (Doris Extention connects to Flea)	M & M	T13N R9W Sec. 21	adit 8' x 9' decline 900' m	9	-	1		52,500	dry	

V.S. - Vertical Shaft

MR & P - Modified roomand pillar

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Narrow Canyon and the several Crownpoint projects either under development or expected. Moving east again is the Poison Canyon area about eight miles north of Milan. In this region the Hope, Poison Canyon, Haystack, and Section 21 mines are located. Northward from the Poison Canyon area about 10 miles lies the Ambrosia Lake region. This region contains Sections 22, 33, 30, 24, 17, 30W, 19, 35, and 36 of Kerr-McGee, Sections 25, 23, 15, 32, and 13 of UN-HP, Ann Lee, Section 27, and Sandstone of UNC, Section 12, and the Spencer shaft. To the west of Ambrosia Lake a short distance is the San Mateo region. Here the Johnny M and Mount Taylor projects are found. Moving westward is the Laguna, Paguate, Seboyeta region. In this region the Jackpile - Paguate, P-10, JJ #1, and St. Anthony mines are located, Northwest of Seboyeta about 19 miles by road is Marquez. The Bokum Resources' mine is being developed here. Westward from Seboyeta is the region located along the edge of the Rio Grande Rift. The western most mine in this area is the Rio Puerco with the Bernabe project located to the Southeast. Figure II-1 indicates these general areas.

Random facts have been gathered from non-confidential data sources for some of the active New Mexico mines. These are discussed for the appropriate mines in the following section.

Sohio's JJ #1 mine has an expected lifetime of 10-15 years. About 15 million pounds of U_3O_8 will be recovered from the Jackpile Sandstone in the property. The ore grade runs between .1 - .4% U_3O_8 and will probably average .18%. The ore is sent to the Sohio mill directly down the hill from the mine. A second underground mine or pit may be developed later. When full production is reached it is hoped that JJ #1 will produce about 1,000 T/day. Mine waste is expected to be 400,000 tons of barren soil and rock and 100,000 - 200,000 tons of low grade (U_3O_8 containing) material. Trouble has been experienced in the mining operation due to swelling of the clays in the Brushy Basin.

Kerr-McGee's Church Rock I mine has a production goal of over 1000 T/day. The mine waste bench is presently more than 30 acres. Any mined rock less than .03 - .05% U_3O_8 is placed on the waste bench. The heat output of the mine is about 350,000 Btu/min. An additional production hoist facility is being constructed at Church Rock. Initial development costs were $15 million.

UNC's Church Rock mine produces through two shafts in order to

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achieve a production capacity of up to 3000 tons/day. This property contains about 20 million tons of ore having an average grade of .15% U_3O_8 (60 million pounds U_3O_8).

Reserves in UNC's Ambrosia Lake properties were reportedly 3.66 million tons of ore with an average U_3O_8 content of .1% (7.4 million pounds U_3O_8) in 1977. In 1977, production on all UNC New Mexico properties was 2.8 million pounds U_3O_8.

Rancher's Johnny M mine has been receiving sand backfill from Kerr-McGee's mill. Production during the final quarter of 1977 was 240,000 lbs. of U_3O_8 compared with an output of 191,000 lbs for the previous quarter.

Gulf's Mariano Lake mine began production in 1977. Ore reserves before mining began were approximately 3.5 million pounds of U_3O_8. By the time the mine achieves full production it is hoped that 625 tons a day of ore can be produced. Average ore grade is about .24%, cut-off is at present about .1%. The ore is not always in secular equilibrium with its daughters and this causes some problems in determining ore grade. By 1981-1982 it is projected that the ore body will be exhausted after having produced 750,000 tons or more of ore. Mining problems have been encountered due to the need to meet early delivery commitments. The ore has had to be mined wet before it was properly dewatered. Retreat is inward-outward. Any ore which runs .05 - .1% U_3O_8 is stockpiled and is not at present being taken to the mill.

Western's Ruby #1 mine is presently producing about 500 tons a day of ore with an average grade of .17% U_3O_8. Cut-off is .05% but any ore which is removed and runs .03% or above is stockpiled. The ore body is in the Brushy Basin and in contrast to Mariano Lake the ore is in secular equilibrium. It is anticipated that this mine will close in 1980.

Anaconda's Jackpile-Paguate consists of two separate ore bodies. The Jackpile complex is approximately 1.5 miles long and over 5 miles wide while the Paguate is 2 miles long and several hundred feet wide. The elements Se, V, and Mo are associated with the deposits. During 23 years of mining 660 acres of open pit area have been produced and overburden has been deposited over 1080 acres. Before mining is finished in 1983 Anaconda will expand the open pit surface area by 90%. Total disturbed area 1976 - 1981 is estimated to be 2650 acres. In

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1976 the ore was blended to .23% U_3O_8 for sending on unit trains to the Bluewater mill. In 1977 it was projected that 499,000 tons of ore containing .04% or more of U_3O_8 with an average grade of .19% (1,925,000 lbs U_3O_8) would be mined from the pits. The tons of associated material mined with the ore was projected to be 1,740,000 tons. In 1978 projections are for 768,000 tons of ore containing an average grade of .14% (2,213,000 lbs U_3O_8) with 2,651,000 tons of associated material. Total tons stripped in 1977 were estimated at 26,000,000 and in 1978 at 21,421,000. Mining is projected to cease in 1982 after the ore grade falls to .15% U_3O_8. During these years stockpile reclaim will also be carried on. Stockpile reclaim should cease in 1985. It was estimated that 1,058,000 pounds of U_3O_3 would be reclaimed from stockpiles in 1977 and 1,557,000 lbs of U_3O_8 in 1978. The ore plus low grade to stripping and waste ratio averaged 1:6.13 from 1965-1975.

The P-10 decline of Anaconda's produces about 1000 tons a day of ore. The ore is crushed and conveyed to the surface on a conveyor belt. P-10 is projected to close in 1980. Average grade of ore varies and is projected to drop from .34% in 1977 to .15% in 1980.

Mines Under Development

At present there are eight mines under development (Table VI-6), including old mines being reopened. There is one in-situ pilot plant facility undergoing development and start-up.

Random facts on the mines now under construction are discussed below.

Kerr-McGee's Church Rock IE project is enlarging the east vent hole into a diameter large enough to permit it to be used for hoisting. The advantage of this technique is that muck is removed from the bottom of the hole and lifted from the main shaft. This process is proving to be a fast way for shaft development. The modification will allow for increased production at Church Rock I to about 1500 T/day and will decrease the underground ore haulage distance for ore mined from the east ore body. A similar shaft will probably be built at Church Rock I W.

Kerr-McGee's Rio Puerco mine contains uranium reserves of approximately 3.2 million pounds of U_3O_8. In the main Rio Puerco deposit in the Westwater member several zones of mineralization more or less coalesce over an area approximately 6,000 feet long and 1,000 feet

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TABLE VI-6

N.M. URANIUM RECOVERY PROJECTS UNDER DEVELOPMENT (NOVEMBER 1978)

NAME	COMPANY	LOCATION	EXPECTED DEPTH (FT.)	EXPECTED PRODUCTION	STATUS	CURRENT DEWATERING (gpm)	EXPECTED DEWATERING (gpm)
St. Anthony	UNC	T11NR4W Sec. 19 & 30	320	NA	Development some ore as haulage ways opened	25	Few gallons minute
Marquez	Bokum Resources	T13NR5W Sec. 25	2,100	800 T/day	At about 1,700 feet trying to dewater shaft	1,200	Could be as high as 3000 but may be less
Church Rock #1E	Kerr-McGee Nuclear Corp.	T17NR16W Sec. 35	1,545	500 T/day estimated	Down concreting to 1,280'	150 (goes to Church Rock shaft)	-
Rio Puerco	Kerr-McGee Nuclear Corp.	T12NR3W Sec. 18	850	510 T/day	Shaft in developing slusher trench & sumps	500	500
Nose Rock	Phillips Uranium Co.	T19NR11W Sec. 31 T19NR12W Sec. 36	3,400	2,100 T/day	shaft #1 ~ 1,000' shaft #2 ~ 1,000' shaft #3 headframe being put in place	~1260-1400 (60-200 shafts-rest dewatering wells)	3,000-6,000
Mt. Taylor	Gulf Mineral Res.	T13NR8W Sec. 24	~3,300	4,000 T/day-4,500 T/day	shaft #1 - 3,100 shaft #2 3,130 (top of Westwater)	1,000 (wells) ~3,500 (shafts)	5,000-10,000
Old Church Rock	UNC	T16NR16W Sec. 17	900	-	Ponds under construction headframe in (reopening old mine)	not yet pumping	Expect 1,000 for 90 days then 450
NA - will connect to Roundy & Barbara J #2	Todilto Explor. & Dev. Corp.	T13NR9W Sec. 30	Shallow adit from surface decline	NA	Stripping & entry preparation in progress	-	Probably dry
Crownpoint in-situ leach	Nobil Oil	T17NR13W Sec. 9	~2,000	mil. lb. year U_3O_8 full sized plant	pilot plant under-going hydrology tests	small amount evaporating in pond	50-200 circulation

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wide. The operation will produce at full production 122,500 tons of ore per year (510 T/day). Expected average ore grade is slightly over .16%. (Shaft sinking was expected to take 550-650 days.) Estimated life of the project is 8 years. To produce the 3.2 million pounds of U_3O_8 will require approximately 122.1 x 10^6 kWh of electricity. The project will disrupt about 72 acres of land. Total accumulation of waste rock produced is estimated to be 370,000 tons. Maximum employment will be 145-150 people.

Bokum's Marquez mine will mine from a Westwater ore body. It is anticipated that another shaft may be sunk near the mill site (1400-1500 foot shaft) or that a haulageway may be built from the present shaft to recover this ore. Total reserves on this property are said to be approximately 2.5 million pounds of U_3O_8. Average ore grade is expected to run about .12% U_3O_8. Mine employment will be 180-200 people. At least part of the uranium production will go to Long Island Power and Lighting.

The Phillip's Nose Rock project has announced reserves of approximately 25 million pounds of U_3O_8 (average grade about .14% U_3O_8) to be produced during the 20 year lifetime (the project is scheduled to reach full production in 1982 or 1983 and to terminate in 2002). The mine recovery efficiency is estimated to be approximately 95% of the ore in place. At this time recovery of Mo as a by-product from the ore is being considered. The Phillip's project has used rings of dewatering wells around the shaft areas to dewater the surrounding area prior to shaft penetration. There are presently three sets of dewatering wells which penetrate the 1) Point Lookout Sandstone, 2) Dakota Sandstone, and 3) Westwater member of the Morrison. The Point Lookout wells will be deepened to dewater the Gallup. This technique appears to be successful. Grouting off aquifers in advance of shaft penetration is also employed. Each shaft of the three shafts is expected to take 30 months to sink, though the present progress is behind schedule. The #1 shaft is 16' across and the #2 shaft is 14'. The transformer capacity at the mine complex was reported to be 15000 KVA. There are four levels of ore (about 150' between the lower and upper) and haulage will be below the ore bodies. It has been tentatively planned to use long-wall retreat with sand backfilling. The State of New Mexico owns the surface of Township 19 North, Range 12 West, Section 36 and the Navajo

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Tribe owns the surface of Township 19 North, Range 11 West, Section 31. About 470 people will be employed at the mines and mill from 1980-1996. In 1978 a maximum of 244 people will be involved in construction. The maximum construction-operation work force will be 685 workers projected to be needed in 1980. At least part of the production at Nose Rock will go to the Nebraska Public Power District.

The UNC St. Anthony mine shaft will produce ore adjacent to UNC's open pit mine. Development is above the Brushy Basin in order to avoid mining problems due to swelling of the Brushy Basin clays. The reserves of UNC in this Laguna district property are 4.41 million tons of ore having an average ore grade of .095% U_3O_8 (8.4 million pounds of U_3O_8). When shaft mining begins the complex should produce 500,000 lb/yr. of U_3O_8. By 1990 UNC would like to achieve a production level of 7 million pounds a year from all its properties.

The Gulf's Mount Taylor mine will have a large effect on total New Mexico U_3O_8 production when it reaches its full production capacity of 1.42 million tons a year of ore having an average grade of .3% U_3O_8. The company has mapped out reserves (and drilling is continuing) of over 100 million pounds of U_3O_8 in the Westwater. The uranium occurs as coffinite and fills the sandstone pore spaces along with organic humates. The uranium is in secular equilibrium with its daughters. The uranium in the ore varies from .05 - 1% U_3O_8 with most running .1 - .5% U_3O_8. The average grade of ore is expected to be around .3%. There are significant quantities of Mo and V in the ore. A work force of approximately 800 people will be needed for the mine. Since rock face temperatures will be around 130°F special air conditioning will be necessary and workers may wear ice vests.

In order to sink the shaft Gulf found that it was necessary to drill dewatering wells to various depths around the two shafts (one 24' and one 14'). At the present time water from the shafts and from the wells is being discharged near San Lucas Dam. A 24" diameter pipe runs several miles from the mine site to the discharge point. Mine water will undergo uranium removal, radium precipitation, and clarification before it is discharged.

Mining may begin by 1979. The expected life is about 20 years.

Mine water from Mount Taylor and Marquez may provide the water for the PSNM 600 MW pumped storage facility near Seboyeta. This project will have an annual average water requirement of 2000 acre-ft.

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Mobil currently has a small in-situ in field test facility set up on their Crownpoint property. Smaller ore bodies and low grade ore bodies can be recovered using this technique. Uranium (U_3O_8) which might be recovered using this method amounts to approximately 40 million pounds on the Mobil properties. However the economics of drilling to such deep depths and problems of fluid circulation, clogging due to precipitation of salts, etc. may discourage these in-situ projects. Better data will be available once the pilot project has been completed.

Mines Which Will Probably be Developed

Table VI-7 lists the mines which will probably undergo development in the coming years. Many of these projects will require several hundred miners each and will discharge from each shaft over 1000 gpm of water. The area around Crownpoint appears to be an area of special importance when considering new development projects. Several of the projects will be discussed in the following paragraphs.

Because most companies do not wish to release data publicly on their future mining plans, many new projects have probably been missed.

Conoco will begin development soon of a mine very near Crownpoint in T19N R12W Section 29. The depth of this mine will be about 2200 feet. Dewatering, depending on other mine development in the area may run to 2700 gpm or slightly more. Continental has been thinking of freezing the ground before shaft sinking. Production will be 1350 ton/day when the mine is in full production.

A large project at Crownpoint is the United Nuclear Corporation's Dalton Pass Project. A 50% undivided interest in this project has been purchased by TVA.

This project has presently about 20 million pounds of U_3O_8 reserves with an average ore grade of .1% U_3O_8. It is proposed to recover these reserves via five mining sites unless the property can be unitized in which case two production shafts may be possible. Initial production rate for each mine will be approximately 200 tons per day increasing to a maximum rate of 1200 ton a day after one year. Maximum anticipated production rate for all mines that may be operating at once is 3400 tons a day or 850,000 tons/year. Sites for these are: 1) shaft #1 - T17N R14W Sec. 13 2) shaft #2 - T17N R14W, Sec. 24 and 25, 3) shaft #3 - T17N R14W, Sec. 23, 4) shaft #4 - T17N R14W, Sec. 13, and

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Table VI-7
New Mexico Probable Mine Projects

NAME	COMPANY	LOCATION	DEPTH (FEET)	DEWATERING (GPM)	EMPLOYMENT	PRODUCTION T/DAY ORE
Mobil Sec. 16	Mobil Oil-TVA	T17N R13W Sec. 16	2200	2000	250	1,200
Dalton Pass	UNC-TVA	T17N R 14W Sec. 13, 23, 24, 25	2200	4000	550	3,400
Section 30	UNC-TVA	T17N R 14W Sec. 30	2200	3000		
Canyon	UNC-TVA	T17N R13W Sec. 34	~ 2800	3000	320	~850
Borrego Pass	Continental Oil	T16N R10W Sec. 18 T16N R11W Sec. 1	2275	3000 - 6000	193	850
Crownpoint	Continental Oil	T19N R12W Sec. 29	2200	2700	NA	1350
Narrow Canyon	Pioneer Nuclear	T18N R14W T17N R14W	2450	3000	230	1400
Bernabe	Continental Oil	T12N R2W Sec. 36	~1966	6000	295	1350
Church Rock II	Kerr-McGee	T17N R16W Sec. 27	2300	6000	140	900
Roca Honda	Kerr-McGee	T13N R8W Sec. 9, 17	1675	2500	NA	600
Marquez	Kerr-McGee	Near Marquez	2000 - 2200	NA	NA	NA
Marquez #2 or haulage way from #1	Bokum	Near Bokum Mill	~2000	NA	NA	NA
JJ #2 & perhaps #3	Sohio	Near Sohio Mill	~600	Small amount	Total 350-400 in all mines	NA
Isabella	Koppen	T13N R9W Sec. 6	~250 - 450' drift from Spencer shaft	Dry	Total Sec. 6 Sec. 8 20	100 - 150
Ruby #2	Western Nuclear	T15N R13W Sec. 27	~ 360	Dry	20 - 40	NA
Ruby #3	Western Nuclear	T15N R13W Sec. 26	~ 360	Dry	20 - 40	NA
Ruby #4	Western Nuclear	T15N R13W Sec. 25	~ 360	Dry	20 - 40	NA

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Table VI-7 (cont.)

NAME	COMPANY	LOCATION	DEPTH (FEET)	DEWATERING (GPM)	EMPLOYMENT	PRODUCTION T/DAY ORE
Church Rock 1W	Kerr-McGee	Same ore body as Church Rock #1	~1800	150 gpm shaft	NA	NA
Ambrosia Lake Sec. 10	Cobb	T14N R10W Sec. 10	400 - 700	NA	NA	NA
Ambrosia Lake Sec. 14	Cobb	T14N R10W Sec. 14	400 - 700	NA	NA	NA
P-15-17	Anaconda	Near Jackpile-Paquate	NA	NA	NA	NA
San Mateo	UNC	T13N R8W Sec. 30	Reopen old mine	NA	NA	NA
House Lake Project	Phillips Uranium Corp.	T15N R13 W Sec. 17 & 20	Shaft	NA	NA	NA
San Mateo Project	Noranda	T13N R8W Sec. 30	Shaft	NA	NA	NA
Nose Rock #2 & #3 (possibly #4, #5, #6, #7)	Phillips Uranium Corp.	T19N R12W Sec. 36 T19N R11W Sec. 30 T19N R11W Sec. 17 T19N R11W Sec. 10 T18N R12W Sec. 1	~3000-4500	max. 54,309 acre ft. all mines per year	NA	NA

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5) shaft #5 T17N R13W, Sec. 30. The total project lifetime is approximately 23 years.

Each mine will have an 18 foot diameter shaft about 2,200 feet deep. Haulage will be from below the ore body. A modified room and pillar technique will probably be used. In areas of multiple ore horizons multiple stopes will be mined. Waste rock may be used as backfill.

A total of eight ventilation shafts are anticipated for a maximum ventilation rate of 250,000 acfm per shaft.

Each mine will probably initially dewater at about 2000 gpm. The maximum dewatering rate from all mines is estimated at 5300 gpm and will probably drop to 3000 gpm.

Power needs will be 27000 KVA when full production is achieved about 1985. Total daily consumption of diesel fuel will be 900 gal/day per shaft. It is estimated that 1.1 gal. of diesel fuel will be used to mine a ton of ore.

The total amount of waste rock that is expected is 2×10^6 tons. A total of 250 acres of surface will be disturbed.

At full production approximately 550 people will be employed. Maximum payroll will be 17 million dollars.

If unification of the leases is possible UNC will split out its project into two projects: the Dalton Pass project and the Section 30 project. The Dalton Pass project will have one or two production shafts and will dewater at about 4000 gpm. The new (to the U.S.) German technology of freezing the shaft area as aquifers are passed through may be used.

The Section 30 project is on Indian allotted lands. Development drilling is presently being conducted for this project. The shaft site as now planned is on the edge of the mesa above the valley floor. Expected dewatering rates are about 3000 gpm. Again this is a 50/50 project with TVA.

UNC has recently filed a mining plan with USGS to develop its property in Section 34 of T17N R13W. UNC is calling this project Canyon. Again this is a 50/50 project with TVA.

As of March 1978 5 million pounds of U_3O_8 (average grade .12%) with a cut-off of .06% U_3O_8 and a minimum thickness of seven feet had been determined. The potential for 1.7 million more pounds with an

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average grade of .143% U_3O_8 is believed to be present. Production of 300,000 T/yr of ore for 17 years is indicated in the plan. Vanadium and molybdenum are present in the ore. If it is not possible to achieve unification of the leases three vertical shafts 2200 to 2800 feet deep will be required, otherwise only one shaft is planned for. If three shafts are necessary dewatering rates may reach 2000 gpm per shaft. If one shaft is used total dewatering rates are predicted to be about 3000 gpm. The water will go through settling ponds, $BaCl_2$ treatment to precipitate radium, and if needed uranium removal in IX facilities. It is projected that about 320 people will be needed. With three shafts total capital investment (1978 dollars) will be $99,500,000. Total operating costs will be $180,000,000 with $90,000,000 labor cost.

It appears that at least initially, ore from the UNC mining projects may be hauled to the UNC mill at Church Rock.

Another project in the Crownpoint area is Borrego Pass in T16N R10W Sec. 18 about 13 miles southeast of Crownpoint. As now projected 3 vertical shafts will be utilized: 1 production and service and 2 vents. The shaft depths will be to about 2275 feet. The development will begin with two 85 inch drilled cased shafts with a 48 inch drilled shaft in between. This 48 inch hole will be enlarged into a production shaft by slabbing down from the top and pouring a concrete liner. This technique has been or is being used at both the Church Rock mines. Dewatering wells dewatering at the rate of 1000 gpm for 300 days during shaft sinking will be utilized. Pump capacity for the mine has been designed to handle 4500 gpm with 100% backup available. It is believed that initial dewatering may run 6000 gpm dropping to 3000 gpm later. The ore body trend is 1500-2100 feet wide and 6000 feet long and runs into T16N R11W Sec. 1. The ore body is fairly extensive horizontally and three haulage levels will probably be necessary. About 850 T/day of ore is the target production capacity. Mine lifetime is predicted to be 21 years. About 193 people will be needed. The annual payroll will run $2,520,000 in 1978 dollars.

Despite the fact that ore reserves are rumored to be well over 20,000 tons U_3O_8 on this property, Conoco has indicated that at least initially it may try to toll its ore rather than build a mill. With the ore reserves which Conoco may have a second production shaft and mill may be possible.

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Depending on the results of their in-situ projects, Mobil may open a shaft mine (T17N R13W, Section 16) near Crownpoint. TVA has purchased a 25% interest in the project, but MDC will be the operator. If shaft mining activities begin, production of 1,200 tons a day of uranium from the shaft is possible. Total production as presently estimated is 10 million pounds of U_3O_8. The Mobil property includes Navajo Tribal land, Navajo allotted land, and public domain.

The mine may have a 14 foot diameter concrete lined shaft sunk to a depth of about 2200 feet. Mining in the Westwater will be from beneath the ore body using a modified room and pillar mining technique. Sand backfilling may be used. Recovery of the ore from the ore body will be about 98% efficient.

Depressuring wells will be drilled to dewater ahead of shaft sinking. If no other mines are developed in the area discharge at the time the shaft enters the Westwater Canyon Member is expected to be 2300 gal/min. Average discharge during the life of the project is estimated at 2000 gpm. If other mines are developed, discharges may be less than these. The Mobil mine dewatering will cause lowering of the water table in the Westwater and will have an impact on the water supply wells at Crownpoint.

Approximately 4000 KW of power will be required. For the extraction of 10 million pounds of U_3O_8, 3.7×10^6 gal. of petroleum fuels will be used (725 gal/day diesel; plus four months of year 780 gal/day propane in shaft heater; four months 50 gal/day diesel heating).

There will be two vent holes. Each will exhaust 100,000 acfm. Storage capacity will be for 40,000 tons of ore. About 50 acres will be disturbed.

At full production approximately 250 people will be employed at the mine. The annual payroll is expected in 1977 dollars to be $6 million. During construction 125 people will be employed.

The lifetime of the mine is expected to be 10-15 years.

The Narrow Canyon property of Pioneer Nuclear Inc. is located about 9 miles west of Crownpoint in T18N R14W and T17N R14W. There are reserves of approximately 2,877,000 tons of ore with an average grade of .12% U_3O_8 (6.9 million pounds U_3O_8), using a cut-off grade of .07. If cut-off is reduced to .05% U_3O_8 reserves increase to 8.6 million pounds. Current plans are to mine for an average grade of .12%

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U_3O_8. The ore is in both the Brushy Basin and the Westwater. Unless more reserves are found mine life is estimated at eight years.

Haulage will be below the ore bodies. The pillars will be taken and waste rock may be used as backfill.

The first shaft will extend to 2450 feet and may be drilled. Two 8' diameter shafts and one 16' diameter shaft will probably be sunk. Ore production is targeted at 350,000 ton/year (1400 ton/day - 5 days a week).

Total installed power will be 9900 KW (compressors - 1650 hp, pumps 2100 hp, ventilation 1350 hp, hoists 1300 hp, slushers 750 hp).

Dewatering wells may be used. A total discharge of 3000 gpm is expected.

The total site will cover 32.2 acres. The waste dump will be on 12.6 acres and will contain 450,000 tons of waste.

Approximately 230 people may be needed.

Kerr-McGee's Church Rock II (T17N R16W, Sec. 22) contains uranium reserves of approximately 15 million pounds of U_3O_8 with an average ore grade of .19% U_3O_8. During construction 62 people are expected to be employed to sink the shaft to 2300' and during the mining period it is expected that 140 people will be employed. The mine will have a 15-20 year lifetime. The tonnage of expected waste is 761,000 tons. Surface disturbance includes 30 acres in the mine site, 24 acres for haulage roads and power lines, and 12 acres for ventilation shafts. About 6000-7000 gpm may be possible in mine dewatering. Projected production is 900 T/day. The cost of construction (1976 dollars) was estimated at 12 million dollars. The company at this time has not indicated when they may begin development on this project.

A large project which will be started soon is Continental Oil's Bernabe mine. The two 14 foot diameter shafts will be developed on T12N R2W, Section 36. The first shaft will be sunk to 1966 feet while the second shaft will extend to 1926. It is reported that the shaft areas may be frozen before shaft sinking begins.

A maximum production rate of 1350 tons per day is anticipated (422 ton/year U_3O_8). Continental has reported that the deposit contains 2,300,000 tons of ore with an average grade of .2% U_3O_8 (9.2 million pounds U_3O_8) however the author believes that the reserves are greater than this. A five year lifetime is reported in the mining plan filed

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with USGS, with reclamation continuing after that time. The U_3O_8 production is committed to Houston Lighting and Power.

The ore body is located in the Westwater. The trend is about 8000 feet long and 500-2000 feet wide. Some thicknesses of ore up to 80 feet occur. There will probably be three mining levels.

About 500,000 cubic yards of waste material will be produced.

The project may use three dewatering wells. The average expected total dewatering flow is 6000 gpm and the water will be brackish. Since there may be hydraulic communication between the Jackpile, Westwater, and Bluff Sandstone, other aquifers besides the Westwater could be affected.

Power will be supplied by New Mexico Public Service.

It is anticipated that a total of 295 people will be employed during maximum ore production.

Continental personnel have also mentioned that Conoco is considering building a mill at the Bernabe project.

Mines which may be developed

There are projects which are probably being considered for which the state has no information. Uranium companies usually try to hold as much information as possible confidential. However it is believed that several old mine re-entries and development of several projects in the future might be possible should there be additional reserves found, economic conditions become favorable, etc. Some of these projects are listed in Table VI-8.

Future Development vs Projected Needs

It would appear from Table VI-6 that there are enough mining projects in the planning stage that if the uranium companies develop these projects New Mexico production can achieve the projected demand level for the next five to ten years. However, until shaft sinking actually begins and mines are into production it will not be known what commitments companies will really make in terms of ore production.

Employment

Table VI-9 indicates trends in employment in uranium mines in the last three years.

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TABLE VI-8

NEW MEXICO POSSIBLE MINE PROJECTS

NAME	COMPANY	LOCATION	DEPTH (FT)	COMMENTS
Church Rock #III	Kerr-McGee	North Church Rock II	~ 3,000	Status not known
L-Bar	Exxon	North L-Bar Mill	NA	Still under feasibility study
West Largo	Gulf	West of Ambrosia Lake		No plans for development at present time
Baca	Gulf	Near Quemado	NA	Found not profitable to develop at present time
North Nose Rock	Phillips	North of Current Project	~ 4,000	Phillips may be considering leaching
Diamond Tail	Union Carbide	T13NR6E Sec. 16	Shallow(pit?)	Undergoing study
Marquez	NA	T13NR9W Sec. 23	Decline	Possible re-entry of old mine
Black Jack #2	Anschutz-Cobb	T15NR13W Sec. 18		Possible re-entry
La Bajada	Lone Star	T15NR7E Sec. 9	Pit	Possible re-entry
NA	Path finder	NA	NA	NA
NA	Leonard Resources	NA	NA	Possible pit or leach
Diamond	Energy Fuels	T15NR17W Sec. 33	NA	Possible re-entry
Evelyn	Energy Fuels	T14NR11W Sec. 9	NA	Possible re-entry or new development

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TABLE VI-12*

SAMPLE	COMPANY	DATE SAMPLE TAKEN	Pb-210 pCi/l	Ra-226 pCi/l	Ra-228 pCi/l	U mg/l	NH_3 mg/l	Na mg/l	Cl mg/l	SO_4 mg/l	As mg/l	Ba mg/l	Se mg/l	Mn mg/l	TDS mg/l	Tss mg/l	
[illegible] Rock #1 (mine)*	Kerr-McGee	10-24-77	15 ± 5	89 ± 5	0 ± 2	1.0	.024	121.9	9.3	60.6	<.005	2.13	.03	<.01	363	29.4	8.59
[illegible] Rock (IX)*	UNC	10-24-77	9.7 ± 5.6	1.9 ± 0.8	0 ± 2	1.2	.036	144.9	24.2	67.2	<.005	.88	.094	<.01	383	-	8.82
[illegible] Lake (mine)	Gulf	10-25-77	0 ± 2	0.1 ± 0.1	0 ± 2	.18	.032	45.3	53.5	1045.0	<.005	-	.002	.05	1643	-	7.77
[illegible]-water (mill tailings [illegible])	Anaconda	10-26-77	1200 ± 100	1800 ± 100	0 ± 2	53	56.9	2118.3	3111.9	8521.6	.62	.55	.006	.16	17850	20.5	2.45
[illegible] (mill tailings liquor)	UN-HP	10-26-77	49 ± 8	58 ± 4	0 ± 2	44	11.23	6141.0	793.2	5531.6	2.86	<.10	51.180	72.0	17035	32	10.12
[illegible] Grosia Lake* [illegible] (IX)	UN-HP	10-26-77	16 ± 7	4.7 ± 1.2	0 ± 2	1.9	.11	207	70.5	675.6	.011	.17	.407	.45	1324	<1	8.14
[illegible] Jaurosia Lake* [illegible] Mines (IX)	Kerr-McGee	10-26-77	14 ± 5	4.3 ± 0.1	0 ± 2	2.6	.014	271.4	88.1	837.2	.012	.66	.036	.79	2608	2.2	8.0
[illegible] Sun 35 & 36 (IX)*	Kerr-McGee	10-26-77	14 ± 5	2.3 ± 0.8	0 ± 2	1.1	.03	271.4	16.7	705	<.005		.023	.62	1231	8.08	8.14
[illegible] M (mine)*	Ranchers	10-27-77	33 ± 6	23 ± 1	0 ± 2	.67	.135	101.2	8.8	213.7	.011		.008	.24	520	2.6	8.35
Taylor (wells)*	Gulf	10-27-77	0 ± 2	0.2 ± 0.1	0 ± 2	.08	.098	216.2	18.6	141.5	<.005		.003	<.01	603	<1	8.7
Taylor (shaft)*	Gulf	10-27-77	10 ± 5	0.7 ± 0.4	0 ± 2	.03	.039	225.4	21.3	136.1	<.005		.003	<.01	620	23.75	8.85
[illegible] Lake [illegible] (IX)*	UNC	10-27-77	17 ± 6	29 ± 1	0 ± 2	.12	.015	427.8	108.1	1060	<.005	.27	.268	3.20	1852	3.1	8.06
[illegible] (mine pond)	Anaconda	11-15-77	26 ± 6	220 ± 20	0 ± 2	2.6	.04	503.7	15.6	842.4	.005		.043	.545	1875	23	8.44
[illegible]*	Bokum Resources	11-15-77	0 ± 2	29 ± 4	0 ± 2	<.01	1.24	209.3	24.0	527.2	.012		<.005	.007	812	553.5	8.33
[illegible] (mill tail. liquor)	Sohio	11-15-77	1800 ± 100	180 ± 20	38 ± 10	1.1	507.17	1203	529.9	303.8	1.108		.33	.879	3205.6	371	.96
[illegible] (pit)*	UNC	11-16-77	17 ± 5	180 ± 20	0 ± 2	2.5	.86	724.5	23.5	2151.1	.005		.019	.018	1378	188	8.18
[illegible] (shaft)*	Kerr-McGee	11-16-77	15 ± 5	14 ± 3	0 ± 2	.02	.49	418.6	19.8	744	.005		.004		1405	31.5	11.55
[illegible] drinking water requirements					combined - 5						.05	1.0	.01				

[illegible] were taken by the water pollution control section of the New Mexico Environmental Improvement Division of the Department of Health [illegible] in the fall of 1977. Radiological analysis was performed by Eberline. All other analyses were performed by the Scientific Laboratory [illegible] in Albuquerque. Samples were treated in accordance with EPA procedures.
[illegible] of the water discharged to an arroyo at the time of sampling.

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GLOSSARY OF MINING TERMS

back	The roof or upper part of any underground mining cavity.
cribbing	The construction of cribs, or timbers laid at right angles to each other, sometimes filled with earth, as a roof support or as a support for machinery. The close setting of timber supports when shaft sinking through loose ground. The timber is usually square or rectangular and practically no ground is exposed. The method is also used for constructing ore chutes.
cross-cut	A horizontal opening driven across the course of vein or, in general, normal to the direction of main workings.
drift	A horizontal opening in or near an ore body and parallel to the course of the vein or the long dimension of the ore body.
muck	Rock or ore broken in the process of mining.
open-stope method	Stoping in which no regular artificial method of support is employed, although occasional props or cribs may be used only where the ore and wall rocks are firm. The simplest open stopes are those in which the entire ore body is removed from wall-to-wall without leaving any pillars. The stoping of ore in this manner is usually confined to relatively small ore bodies, since regardless of the firmness of the ground, there is a limit to the length of unsupported span which will stand without breaking.
raise	A vertical or inclined opening driven upward from a level to connect with the level above, or to explore the ground for a limited distance above one level.
roof	The ceiling of any underground excavation. Same as the "back."
roof bolt	Long steel bolts driven into walls or roof of underground excavations to strengthen the pinning of rock strata. They are expanded by means of a wedge which opens a sleeve surrounding it.
room and pillar method	In coal and metal mining, supporting the roof by pillars left at regular or irregular intervals.
sand fill	Hydraulic or pneumatic filling, stowing. Use of sand conveyed underground by water or air to support cavities left by extraction of ore.

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Glossary of Mining Terms - continued

set	A timber or steel frame for supporting the sides of an excavation, shaft or tunnel.
adit	Nearly horizontal passage from the surface.
shaft collar	Supporting framework at top of shaft from which linings may be hung. The term applies to the timber, steel, or concrete around the mouth or top of a shaft.
sill	The floor of an opening or passage in a mine.
slusher	A machine used for loading coal or rock by pulling an open-bottomed scoop back and forth between the face and the loading point by means of ropes, sheaves, and a multiple drum hoist
square set stoping	A method of stoping in which the walls and back of the excavation are supported by regular framed timbers forming a skelton enclosing a series of connected, hollow, rectangular prisms in the space formerly occupied by the excavated ore and providing continuous lines of support in three directions at right angles to each other. The ore is excavated in small, rectangular blocks just large enough to provide room for standing a set of timber.
stope	Commonly applied to the extraction of ore, but does not include the ore removed in sinking shafts and in driving levels, drifts, and other development openings.

Source: Kerr-McGee

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GLOSSARY OF MINING TERMS

back	The roof or upper part of any underground mining cavity.
cribbing	The construction of cribs, or timbers laid at right angles to each other, sometimes filled with earth, as a roof support or as a support for machinery. The close setting of timber supports when shaft sinking through loose ground. The timber is usually square or rectangular and practically no ground is exposed. The method is also used for constructing ore chutes.
cross-cut	A horizontal opening driven across the course of vein or, in general, normal to the direction of main workings.
drift	A horizontal opening in or near an ore body and parallel to the course of the vein or the long dimension of the ore body.
muck	Rock or ore broken in the process of mining.
open-stope method	Stoping in which no regular artificial method of support is employed, although occasional props or cribs may be used only where the ore and wall rocks are firm. The simplest open stopes are those in which the entire ore body is removed from wall-to-wall without leaving any pillars. The stoping of ore in this manner is usually confined to relatively small ore bodies, since regardless of the firmness of the ground, there is a limit to the length of unsupported span which will stand without breaking.
raise	A vertical or inclined opening driven upward from a level to connect with the level above, or to explore the ground for a limited distance above one level.
roof	The ceiling of any underground excavation. Same as the "back."
roof bolt	Long steel bolts driven into walls or roof of underground excavations to strengthen the pinning of rock strata. They are expanded by means of a wedge which opens a sleeve surrounding it.
room and pillar method	In coal and metal mining, supporting the roof by pillars left at regular or irregular intervals.
sand fill	Hydraulic or pneumatic filling, stowing. Use of sand conveyed underground by water or air to support cavities left by extraction of ore.

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Glossary of Mining Terms - ontinued

set	A timber or steel frame for supporting the sides of an excavation, shaft or tunnel.
adit	Nearly horizontal passage from the surface.
shaft collar	Supporting framework at top of shaft from which linings may be hung. The term applies to the timber, steel, or concrete around the mouth or top of a shaft.
sill	The floor of an opening or passage in a mine.
slusher	A machine used for loading coal or rock by pulling an open-bottomed scoop back and forth between the face and the loading point by means of ropes, sheaves, and a multiple drum hoist
square set stoping	A method of stoping in which the walls and back of the excavation are supported by regular framed timbers forming a skelton enclosing a series of connected, hollow, rectangular prisms in the space formerly occupied by the excavated ore and providing continuous lines of support in three directions at right angles to each other. The ore is excavated in small, rectangular blocks just large enough to provide room for standing a set of timber.
stope	Commonly applied to the extraction of ore, but does not include the ore removed in sinking shafts and in driving levels, drifts, and other development openings.

Source: Kerr-McGee

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