Region 4 Environmental Protection Agency

Community Interview Questionnaire

Wiley Property Removal Site

Date: Wednesday, 12:30 pm

Name: Brenda Conder

Address: [redacted] (b)(6) Personal Privacy

Phone: [redacted] (b)(6) Personal Privacy

Email: [redacted] (b)(6) Personal Privacy

1. What do you know about site/residence? Does not have time to meet w/ EPA, she & husband have very very busy schedules. We talked on phone.

a. Previous use of the property

b. Previous residents

Was shocked to find out about the area. She knew the people that built the house. The woman that just moved was not quite right. Felt she was chasing $. She bought he house in 2002. Farmers use to use arsenic on property a long time ago. Was happy when Wiley's moved away. 2015 State EPD went door to door to ck folks water. They drink city water.

2. How have you been able to find out information about the property?

You live across the road. Ms. Jean ~~Marden~~ Masden lived there, her son built house & died of diabetics. Someone else lived there short time before Wiley.

3. Explain to the resident what is happening at the site..... Show them the map. No

~~Act did th~~

4. Would you like to receive more information about this site and what EPA is doing there? If yes, how would you like to receive the information?

a. Mailing list

b. Phone calls

c. Postcards

d. Emails

e. Face-to face

11087016

5. Is there anything in particular that you want or need to know? No

6. Are you aware of any community concerns?
Yes folks are concerned but not worried to death over it.

7. Are there other folks that you feel we need to talk to in the community about this site.
Yes, the Kibbons

8. Are you aware of any local groups addressing the site in any way?
No

9. How are your local officials perceived within the community?
David Johnston - up to speed on the issue. Ohio County judge executive / very nice, very intelligent

10. How do you normally get your information about important issues?
news, tV / newspaper, the Messenger

11. What is the most popular newspaper, TV Station, and Radio station?
Radio: WBKR - Owensboro
Channel 25 - Evansville
Messenger Inquirer - Owensboro

12. If needed, where do you think would be a good place to hold a public meeting?
Where judge exec. offices are. Down town Hartford.

12. Do you have any final questions for us? No

13. Provide the resident a copy of the factsheet. Y / N
Left it in the mailbox.

~~14. Inform the resident of the repository. Y / N~~

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Region 4 Environmental Protection Agency

Community Interview Questionnaire

Wiley Property Removal Site

Date: Wednesday, 3:45 pm

Name: Ms. Kendra Jones

Address (b)(6) Personal Privacy

Phone (b)(6) Personal Privacy

Emai (b)(6) Personal Privacy

1. What do you know about site/residence? Not much at all.

a. Previous use of the property unknown

b. Previous residents

Lived here 2.5 yrs. Bought house 3 yrs ago.

2. How have you been able to find out information about the property?

Word of mouth

3. Explain to the resident what is happening at the site....., ~~Show them the map.~~ Art explained Found arsenic/state chasing it/State was on property while we were there.

4. Would you like to receive more information about this site and what EPA is doing there? If yes, how would you like to receive the information?

a. Mailing list

b. Phone calls 4pm or after

c. Postcards

d. Emails

e. Face-to face

11087018

5. Is there anything in particular that you want or need to know? No

6. Are you aware of any community concerns?

7. Are there other folks that you feel we need to talk to in the community about this site.
Not real familiar w/ neighbors

8. Are you aware of any local groups addressing the site in any way? No

9. How are your local officials perceived within the community?

10. How do you normally get your information about important issues?
TV / newspaper

11. What is the most popular newspaper, TV Station, and Radio station?

12. If needed, where do you think would be a good place to hold a public meeting?

12. Do you have any final questions for us? No

13. Provide the resident a copy of the factsheet. (Y) / N

14. ~~Inform the resident of the repository. Y / N~~

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11050314

[redacted]

Summary: R.McGuffey

Wiley Property Complaint-Ohio County- 209 Shinkle Chapel Rd. Hartford

Incident 2381255, Agency Interest # 124089

Complaint assigned- 8/26/14

Initial Investigation- 9/25/14

1st samples collected- 10/2/14

2nd samples collected- 10/22/14

Contacts: (b)(6) Personal Privacy **-Complainant- Phone #** (b) (6)

(b) (6) **-previous property owner- Phone #** (b) (6)

(b) (6) **stated she had lived at the address from December, 2008- November 2013.**

- **The property is a 10 acre tract of land.**
- **In the complaint** (b) (6) **stated a portion of the property had been used as a disposal site of an unknown material.**
- **The material had previously been kept in a tobacco barn, and the barn had burned.**
- (b) (6) **stated little or no vegetation grew on this spot.**
- (b) (6) **stated there had been an above ground tank on the property.**
- **She stated there was a white powdery substance around the storage tank.**
- **The caller stated she raised registered dogs, (Labradoodles), (About 60), while living on the property.**
- **She stated that all the females bred were sterile and that multiple dogs suffered from tumors.**
- **She stated that she was concerned for her 16 year old daughter who was 10 years old while living at the property.**
- **She stated Wells-Fargo now owns the property.**

9/25/14, 10:00 am

Conducted Initial Investigation on site. Arrived at property and observed area where white residue was visible. The area is 25' X 30' in size. The spot looked like an area where a crude oil tank battery had been staged.

-Google Earth images appeared to have roads into the wooded area in a radius pattern which is indicative of crude oil production. This area of Ohio County is an oil production zone.

Log Book Notes: White media possible crude oil tank site- High Chlorides.

Dead area down gradient might indicated brine/wastewater discharge.

Spoke with neighbor who stated property was formerly owned by (b) (6)

9/30/14,

Called (b) (6) is a hospital Administrator in Nashville Tennessee. He stated he had tracked off the 10 acre property in 1995. His brother, who is now deceased built the house that is on site. He stated he didn't know what the dead area was.

Contacted Ron Lovitt to discuss sampling. Decision made to sample for VOC's, Chlorides, total metals and TCLP metals.

Called Complainant,(b) (6) stated she was told a barn had been on the spot and was burned down with chemical containers inside. The waste or product may have been in drums. She also stated she had seen two large tanks staged in the woods next to Shinkle Chapel road near her driveway.

- Directions to the tanks were to turn left/west at the end of the driveway and the tanks were .1 mile on the left near the property line.
- (b) (6) also stated she was told Mr. Miller let a chemical company store materials in the barn on the property and the barn had burned.

10/2/14

Site Investigation and sampling

Kevin Patrick and Rob McGuffey investigated the site and collected (12) samples from four sampling points. Samples were collected between 11:30 am and 12:00 Noon.

Analytical- Chlorides, TCLP Metals, Total Metals, VOC's, PAH's

10/17/15

Preliminary results from 10/2 samples show elevated metals.

Arsenic- 361,000 ppm (A)

Arsenic- 525,000 ppm (B)

Arsenic- 195,000 ppm (C)

Arsenic- 58,000 ppm (D)

10/21/14

Conference Call with DWM Field Office Branch Mgr. Jon Maybriar and Superfund personnel to discuss further sampling plan for the site ,based on elevated metal results.

10/22/14

DEP Worksite Hazard Assessment prepared

- Wear full tyvek suits, respirators, goggles, sampling gloves.
- Have container of decon water
- Establish drum to collect all contaminated materials and label.
- Maintain safety and hazard taping of the area of concern.

1:00 pm- R.McGuffey,K. Patrick, R. Denton, collected an additional 12 samples of the area, beginning with the most down gradient extent of visual impact.

10/23/14

Samples prepared and delivered to McCoy & McCoy labs in Madisonville.

Total Metals, TCLP Metals, Pesticides/Herbicides, TCLP-Herb/Pest.

10/24/14

Phone conference with (b) (6) . (b) (6) **Stated he burned the barn in 1995 and dozed the remnants off the hill onto his property.**

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

OCT 1 1 2016

ACTION MEMORANDUM

SUBJECT: 12-Month Exemption Request for a Removal Action at the Wiley Property Site
Hartford, Ohio County, Kentucky

FROM: Art Smith, On-Scene Coordinator
Emergency Response, Removal and Prevention Branch

THRU: James W. Webster, Chief
Emergency Response, Removal and Prevention Branch

TO: Franklin E. Hill, Director
Superfund Division

I. PURPOSE

The purpose of this Action Memorandum pursuant to Section 104 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) is to request an exemption to the 12-month statutory limit on a removal action in order to continue response activities at the Wiley Property Site (the Site) located in Hartford, Ohio County, Kentucky. The Site continues to pose a threat to public health and the environment that meets the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Section 300.415(b)(2) criteria for removal actions. A 12-month exemption request is necessary to complete the removal of contaminated soils where arsenic concentrations at the surface exceed the U.S. Environmental Protection Agency's Removal Management Levels (RML) for residential areas.

II. SITE CONDITIONS

(Note: Please refer to the June 22, 2016 Action Memorandum for additional site background information, which is provided as Attachment A).

Site ID (SSID):	B45H
CERCLIS ID:	KYN000403430
NPL Status:	Non-NPL
Removal Category:	Time-Critical Removal

In September 2014, the Kentucky Department for Environmental Protection (KDEP) performed an initial visual investigation at the Site, based on complaints filed by a former resident. They confirmed a source area where a white unknown substance was located in an area devoid of vegetation and approximately 30 feet in diameter. Samples were collected in October 2014 by KDEP, and analysis of the samples collected from this area revealed total arsenic at levels up to 525,000 milligrams/kilogram (mg/kg). The Toxicity Characteristic Leaching Procedure (TCLP) was performed on the sample with the highest total arsenic level, and the result came back as 618 milligrams/liter (mg/L) leachable arsenic. Additional investigation and sampling conducted in October 2014 by KDEP documented that the arsenic contamination had migrated downhill a distance of approximately 120 feet to the north and west of the source area.

On November 14, 2014, the KDEP Superfund Branch formally requested that the EPA conduct a Removal Site Evaluation (RSE) at the Site. On March 24, 2015, the Region 4 Superfund Technical Assessment and Response Team (START) contractor mobilized to the Site to collect samples. The purpose was to confirm the 2014 KDEP findings and to explore the potential for additional migration pathways at the Site. Also, a subset of samples were run for arsenic speciation in an attempt to identify the specific arsenic compound at the Site. The sample collected from the source area was analyzed for total arsenic, and the analysis revealed the concentration of arsenic to be 747,000 mg/kg. The arsenic speciation determined that the arsenic is an arsenite compound (As+3).

Based on this information, the On-Scene Coordinator (OSC) completed the RSE under 40 CFR Section 300.410 and concluded that the Site meets the National Contingency Plan (NCP) criteria for a time-critical removal action.

On October 13, 2015, the OSC mobilized to the Site with Emergency and Rapid Response Services (ERRS) contractor CMC, Inc. to begin a time-critical removal action under his $50,000 programmatic authority. Actions taken at that time were focused on consolidation and stockpiling of the arsenic compound in the source area. The area was fenced, and signs warning of the arsenic hazard were posted at the Site. The OSC and ERRS contractor demobilized from the Site on October 16, 2015, marking completion of the first phase of the removal action.

On July 5, 2016, the ERRS contractor mobilized to the Site to begin the second phase of the removal action, which was approved in the June 22, 2016 Action Memorandum. The approved tasks consists of the following:

- Remove stockpiled waste materials and dispose of at an approved hazardous waste management facility.
- Excavate soils on the residential property to an approximate depth of 1.5 feet below land surface (BLS) where arsenic concentrations at the surface are at 68 mg/kg or above and dispose of at a permitted off-site facility.
- Excavate soils on the non-residential property to an approximate depth of 1.5 feet BLS where arsenic concentrations at the surface are at 420 mg/kg or above and dispose of at a permitted off-site facility.

- Excavate sediments along an 800-foot segment of the dry creek bed draining the Site along its northern boundary. Excavation will be carried out along this segment until a residual arsenic concentration of 50 mg/kg and compliance with the Water Quality Criteria (WQC) of 0.340 mg/l for acute toxicity is achieved.
- Backfill excavated areas on the residential property with clean soil to re-establish vegetative cover and re-grade the areas to promote positive drainage.
- Re-establish vegetative cover on the non-residential property and re-grade the area to promote positive drainage.

As of September 16, 2016, approximately 2,570 cubic yards (c.y.) of arsenic-contaminated soils have been excavated and stockpiled awaiting disposal. An estimated additional 2,600 c.y. will require excavation and disposal. About half of this additional volume will come from the excavation of sediments from the dry creek bed forming the northern boundary of the Site.

According to the NOAA National Centers for Environmental Information, July 2016 was the wettest ever for the month of July in Western Kentucky, with recorded precipitation over 11.75 inches. For this Site, the impacts have caused delays in beginning excavation work due to the unusually wet conditions. In particular, the normally dry creek bed has been saturated due to flooding in the low-lying areas of the Site. The arsenic levels in this area were characterized as a "significant risk to small home range wildlife" by the EPA Region 4 Superfund Division, Scientific Services Section. An exemption to the 12-month statutory limit on CERCLA removal actions is required to complete the response measures at this Site.

III. THREATS TO PUBLIC HEALTH WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

Conditions at the Site may present a threat to public health or welfare, and meet the criteria for initiating a removal action under 40 CFR Section 300.415(b)(2) of the NCP. The following factors from Section 300.415(b)(2) of the NCP form the basis for the EPA's determination of the threat presented, and the appropriate actions to be taken:

300.415(b)(2)(i): Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants.

Although the home is not presently occupied, the extremely high total arsenic concentrations in the source area constitutes a potential human exposure pathway. Furthermore, there are limited controls on access to the Site, and the threat of direct contact with the arsenic compound and potential exposure to animals and the food chain is significant.

According to the EPA Air Toxics website (http://www.epa.gov/ttnatw01/hlthef/arsenic.html), "Acute (short-term) high-level inhalation exposure to arsenic dust or fumes has resulted in gastrointestinal effects (nausea, diarrhea, abdominal pain); central and peripheral nervous system disorders have occurred in workers acutely exposed to inorganic arsenic. Chronic (long-

term) inhalation exposure to inorganic arsenic of humans is associated with irritation of the skin and mucous membranes and effects in the brain and nervous system. Chronic oral exposure to elevated levels of inorganic arsenic has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyperpigmentation, and liver or kidney damage in humans. Inorganic arsenic exposure of humans, by the inhalation route, has been shown to be strongly associated with lung cancer, while ingestion of inorganic arsenic by humans has been linked to a form of skin cancer and also to bladder, liver and lung cancer. The EPA has classified inorganic arsenic as a known human carcinogen."

In order to be protective of both human health and the environment, the OSC solicited input from the EPA Region 4 Office of Technical Services (OTS). The following cleanup criteria has been developed for this time-critical removal action:

Residential Property:

Areas found to have arsenic concentrations at the surface at 68 mg/kg or above will be excavated to a depth of 1.5 feet below land surface (BLS) and backfilled with clean soil.

Non-Residential Property:

Areas found to have arsenic concentrations at the surface at 420 mg/kg or above will be excavated to a depth of 1.5 feet BLS.

These cleanup goals for soil removal are based on limiting the excess cancer risk associated with potential exposure to arsenic to a probability of less than 1 in 10,000 people. (1×10^{-4}).

In addition, there is a segment of the dry creek bed along the northern boundary of the Site that is significantly contaminated with arsenic. In order to be protective of species inhabiting this area, an 800-foot segment will be excavated to an average residual arsenic concentration of 50 mg/kg in creek sediments. The parallel goal will be to remove arsenic-contaminated creek sediments such that the WQC of < 0.340 mg/l of arsenic in surface water is attained.

The two risk memos which detail the basis for selection of the cleanup criteria for this Site are provided as Attachment B to the June 22, 2016 Action Memorandum.

300.415(b)(2)(ii): Actual or potential contamination of drinking water supplies or sensitive ecosystems.

Although there are no known private well users in the vicinity of the Site, there is documented evidence of a drinking water well on the Wiley Property. It is unknown whether the arsenic contamination has migrated downward to an extent where the drinking water supply would be impacted, but the potential is there due to the high concentrations of arsenic at the surface.

300.415(b)(2)(iv): High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

The evidence of arsenic migration at the surface is documented by the discovery that arsenic wastes were discovered at distances of up to 1,800 feet away from the source area in creek sediments.

300.415(b)(2)(v): Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

The arsenic deposited at the surface is in a physical state that would allow migration to other areas via runoff from significant rain events and high winds.

300.415(b)(2)(vii): The availability of other appropriate federal or state response mechanisms to respond to the release.

At this time, there are no other federal or state government mechanisms that are able to respond to this incident in a timely manner and with the resources needed to assume the cleanup.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the Removal Action described in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare or the environment.

V. EXEMPTION FROM THE 12-MONTH STATUTORY LIMIT FOR A REMOVAL ACTION

A. Emergency Exemption

1. There is an immediate risk to public health or welfare. The concentrations of arsenic in soils on both the residential and non-residential yards represent conditions where actual exposures are occurring. Although the house is no longer occupied, trespassing continues to be an issue as evidenced by fresh four wheeler tire tracks in certain areas of the Site where hazardous substances are found. Accidental ingestion is the potential threat to those who frequent the site for recreational outdoor activities (i.e., four-wheeling and hunting). Arsenic is a known human carcinogen, in addition to posing both acute and chronic health risks, as cited previously in this Action Memorandum.

2. Continued response actions are immediately required to prevent, limit, or mitigate an emergency. Excavation of contaminated soils will mitigate actual exposures which are occurring at the present time. Removal of contaminated sediments from the dry creek bed will prevent further migration of contaminants and eliminate the risk of ingestion by trespassers or foraging wildlife.

3. Assistance will not otherwise be provided on a timely basis. As cited previously, KDEP requested that the EPA Region 4 take a time-critical removal action at this Site. State and local agencies do not have sufficient funds to conduct additional site response activities in a timely manner.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions (See Section II of this Action Memorandum and Attachment A for a complete description of response actions already in progress at this Site)

B. Estimated Costs (See August 22, 2016 memo re-directing funds from the extramural cost contingency for this Site)

	Current Ceiling	Change	New Ceiling
Regional Allowance Costs			
ERRS Contractor	$1,450,000	+$250,000	$1,700,000
Other Extramural Costs Not Funded From the Regional Allowance			
START Contractor	$ 100,000		$ 100,000
Subtotal, Extramural Costs	$1,550,000		
Extramural Cost Contingency (20%)	$ 300,000	-$250,000	$ 50,000
TOTAL SITE CEILING	**$1,850,000**		**$1,850,000**

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

A delay in action or no action at this Site would increase the actual or potential threats to the public health and/or the environment.

VIII. OUTSTANDING POLICY ISSUES

None.

IX. ENFORCEMENT (See Attachment A for the Confidential Enforcement Addendum)

The total EPA costs for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated at:

Total Removal Project Ceiling	$1,850,000
EPA's Direct Intramural Costs	$70,000
Subtotal	$1,920,000
Regional Indirect Cost (55.33%)*	$1,062,336
ESTIMATED TOTAL EPA COSTS	**$2,982,336**

X. RECOMMENDATION

Conditions at the Site meet criteria for the CERCLA section 104(c) emergency exemption, and I recommend that you approve an exemption from the 12-month limit to allow a continued removal response. The total project ceiling is $1,850,000 of which $1,700,000 comes from the Regional Removal Allowance.

APPROVED: _____ DATE: 10/11/16
Franklin E. Hill, Director
Superfund Division

DISAPPROVED: _____ DATE: _____
Franklin E. Hill, Director
Superfund Division

Attachments

*Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of the removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of total cost estimates nor deviation of actual costs from this estimate will affect the United States' right to cost recovery.

MEMORANDUM

DATE: **August 19, 2016**

SUBJECT: Funding Increase for Wiley Property Site
Hartford, Ohio County, KY
Contractor: CMC, Inc.
Contract Number: EP-S4-15-04, Task Order No. 0007
POP: 9/21/2016 through 8/23/2017

FROM: Art Smith, OSC

TO: Site File

The purpose of this memorandum is to provide additional funding in the amount of $300,000 for the Wiley Property Site increasing ERRS funding from $1,450,000 to $1,700,000. Funding will be provided by moving $250,000 available in Extramural Contingency to ERRS. This action is pursuant to the Action Memo signed by Franklin E. Hill dated June 22, 2016. This allocation will leave an available Contingency balance of $50,000.

Action Memo Funding Summary:

Extramural Costs	**Current Ceiling**	**+/- Change**	**New Ceiling**
Regional Allowance Costs			
ERRS Contractor	$1,450,000	+$250,000	$1,700,000
Other Extramural Costs Not Funded From the Regional Allowance			
START Contractor	$ 100,000		$ 100,000
Subtotal, Extramural Costs	$1,550,000		$1,800,000
Extramural Cost Contingency (20%)	$ 300,000	-$250,000	$ 50,000
TOTAL SITE CEILING	**$1,850,000**		**$1,850,000**

cc: Dora Ann Johnson, Project Officer
Lloyd Bates, Senior Site Administrative Officer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUN 28 2016

Mr. Larry Hughes
Kentucky Department for Environmental Protection
200 Fair Oaks Lane
Frankfort, KY 40601

Dear Mr. Hughes:

We are pleased to provide a copy of the Ceiling Increase Action Memorandum for the Wiley Property Site (the Site) located in Hartford, Ohio County, Kentucky. If you have any questions or comments concerning this document or the continuation of the removal activities at this Site, please contact the On-Scene Coordinator at the following address:

Art Smith, OSC USEPA
600 MLK Jr. Place
Ramano L. Mazzoli Federal Building
Room 172A
Louisville, KY 40202

Sincerely,

06/28/2016

James W. Webster, Chief
Emergency Response, Removal and Prevention Branch

Enclosure

cc: Dawn Taylor
James Webster
Matt Taylor
Subash Patel
Kerri Sanders
Art Smith
Lloyd Bates
Anita Davis
Ronald Saskowski
Chris Masterson
Paula Painter
Katrina Jones
Dora Ann Johnson
Charlotte Whitley

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

ACTION MEMORANDUM

SUBJECT: Request for a Change of Scope and Ceiling Increase for a Removal Action at the Wiley Property Site, Hartford, Ohio County, Kentucky

FROM: Art Smith
On-Scene Coordinator

THRU: James W. Webster, Chief 04/14/2016
Emergency Response, Removal and Prevention Branch

TO: Franklin E. Hill, Director
Superfund Division

I. PURPOSE

The purpose of this Action Memorandum pursuant to Section 104 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) is to request authorization for a change in scope and an increase in the project ceiling for the time-critical removal action initiated previously at the Wiley Property Site (the Site), located in Hartford, Ohio County, Kentucky. The Site continues to pose a threat to public health and the environment that meets the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Section 300.415(b)(2) criteria for removal actions. A change in the scope of the project and a ceiling increase are necessary to complete the removal of contaminated soils at residential locations where arsenic concentrations at the surface exceed the U.S. Environmental Protection Agency's Removal Management Levels (RML) for residential areas.

The new total project ceiling, if approved, will be $1,850,000, of which an estimated $1,450,000 will be funded through the Regional Removal Allowance. This ceiling includes the costs for all the actions contemplated in this Action Memorandum.

II. SITE CONDITIONS AND BACKGROUND

Site ID (SSID):	B45H
CERCLIS ID:	KYN000403430
NPL Status:	Non-NPL
Removal Category:	Time-Critical Removal

A. Site Description

1. Removal Site Evaluation

In August 2014, the last known occupant of the residence at 209 Shinkle Chapel Road contacted the Kentucky Department for Environmental Protection (KDEP) with a concern about an unknown white powdery substance at the Site. KDEP reported that the former occupant bred dogs at the Site and that the females were found to be sterile while others suffered from tumors. The former occupant was concerned about potential exposure to her family members while they lived at the property.

In September 2014, KDEP performed an initial visual investigation at the Site. They confirmed an area where the white substance was located in an area devoid of vegetation and approximately 30 feet in diameter. Samples were collected in October 2014, and analysis of the samples collected from this area revealed total arsenic at levels up to 525,000 milligrams/kilogram (mg/kg). The Toxicity Characteristic Leaching Procedure (TCLP) was performed on the sample with the highest total arsenic level and the result came back as 618 milligrams/liter (mg/L) leachable arsenic. Additional investigation and sampling in October 2014 documented that the arsenic contamination had migrated downhill a distance of approximately 120 feet to the north and west of the source area.

On November 14, 2014, the KDEP Superfund Branch formally requested that the EPA conduct a Removal Site Evaluation (RSE) at the Site. On March 24, 2015, the Region 4 Superfund Technical Assessment and Response Team (START) contractor mobilized to the Site to collect samples. The purpose was to confirm the 2014 KDEP findings and to explore the potential for additional migration pathways at the Site. Also, a subset of samples were run for arsenic speciation in an attempt to identify the specific arsenic compound at the Site.

The sample collected from the source area was analyzed for total arsenic and the analysis revealed the concentration of arsenic to be 747,000 mg/kg. The arsenic speciation determined that the arsenic is an arsenite compound (As+3).

Based on this information, the On-Scene Coordinator (OSC) completed the RSE under 40 CFR Section 300.410, and concluded that the Site meets the National Contingency Plan (NCP) criteria for a time-critical removal action.

On October 20 and 21, 2015, START's Tetra Tech and OTIE contractors conducted the following sampling activities at the Site:

- X-ray fluorescence (XRF) soil and sediment screening
- Vacuum sampling and air sampling from within the interior of the single family residence

- Surface and subsurface soil sampling at various locations on-site
- Surface sediment sampling from a dry creek bed located directly down-gradient of the source area

All samples collected from the inside of the residence were analyzed for the presence of arsenic and were found to be non-detect.

However, arsenic was detected in sediments along the entire 1,800-foot segment of the dry creek bed that was surveyed in concentrations ranging from 130 mg/kg to 4,200 mg/kg. Approximately 700 feet of the dry creek leading to the confluence with Little No Creek remains uncharacterized due to access issues encountered during the October 2015 sampling investigation.

(See Attachment A for maps detailing the sample locations and results obtained during the RSE).

In February 2016, the OSC directed the OTIE START contractor to collect samples of surface water runoff in the stream beds which drain the Site to the north and south. The surface water sample in the northern drainage feature was revealed to contain 0.507 milligrams per liter (mg/l) of arsenic. This exceeds the Water Quality Criteria (WQC) adopted by the Commonwealth of Kentucky of 0.340 mg/l, based on acute toxicity to aquatic species. The surface water feature in the southern drainage feature was discovered to be non-detect for arsenic.

2. Physical Location and Site Characteristics

The Wiley Property Site consists of two parcels in Hartford, Ohio County, Kentucky. The first tract is designated as Tax/Parcel ID 73-17-1 in the records for Ohio County, KY. This tract comprises 10.2 acres and is located at 209 Shinkle Chapel Road. This property is currently held by Wells Fargo Bank, following a foreclosure and Master Commissioner's sale in 2014. There are two improvements on Tax/Parcel ID 73-17-1: a single family home (currently unoccupied) and an outbuilding.

The second tract making up the Site is designated as Tax/Parcel ID 73-17 in the records for Ohio County, KY. This parcel is privately owned, and a portion of this property was subdivided to sell Parcel 73-17-1 in 2007. There are reports of an old barn on this property which was subsequently destroyed, thus suggesting that the past use of the property was for agricultural purposes.

The Site is bordered to the north by Shinkle Chapel Road, and by wooded, rural and agricultural lands to the east, south and west. There are 10 homes located within a half-mile radius of the Site.

3. Release or Threatened Release Into the Environment of a Hazardous Substance, Pollutant or Contaminant

Part 302.4 of Title 40 of the Code of Federal Regulations lists arsenic as a hazardous substance under section 102(a) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Based on analytical results provided by KDEP, arsenic present at this Site may also be a hazardous waste pursuant to the Resource Conservation and Recovery Act (RCRA) by virtue of its toxicity characteristic (EPA HW No. D004 in 40 CFR § 261.24(b)).

4. NPL Status

The Site is not proposed for the National Priorities List (NPL). The Site was screened for inclusion on the NPL, but it will not score.

B. Other Actions to Date

1. Previous actions

On October 13, 2015, the OSC mobilized to the Site with Emergency and Rapid Response Services (ERRS) contractor CMC, Inc. to begin a time-critical removal action under his $50,000 programmatic authority. Actions taken at that time were focused on consolidation and stockpiling of the arsenic compound. The area was fenced, and signs warning of the arsenic hazard were posted at the Site. The initial Action Memo is provided as Attachment B for reference.

C. State and Local Authorities' Roles

1. State and local actions to date

KDEP's initial referral to the EPA included two former storage tanks which were found abandoned at a nearby location along Shinkle Chapel Road. These tanks were sampled by KDEP and found to contain the same arsenic compound discovered at the Site. In January 2015, KDEP informed the EPA that it will dispose of the arsenic waste found in the two storage tanks. The tanks were removed in March 2015. Subsequently, KDEP has tracked arsenic contamination in sediments in a drainage ditch downstream of the former storage tank location, and is currently developing a remediation plan for that Site.

2. Potential for continued state/local response

As cited previously, KDEP requested that the EPA Region 4 take a time-critical removal action at this Site. State and local agencies do not have sufficient funds to conduct additional site response activities in a timely manner.

III. THREATS TO PUBLIC HEALTH WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

Conditions at the Site may present a threat to public health or welfare, and meet the criteria for initiating a removal action under 40 CFR Section 300.415(b)(2) of the NCP. The following factors from Section 300.415(b)(2) of the NCP form the basis for the EPA's determination of the threat presented, and the appropriate actions to be taken:

300.415(b)(2)(i): Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

Although the home is not presently occupied, the extremely high total arsenic concentrations in the source area constitutes a potential human exposure pathway. As mentioned previously, there is documented evidence of arsenic migration into the home. Furthermore, there are limited controls on access to the Site, and the threat of direct contact with the arsenic compound and potential exposure to animals and the food chain is significant.

According to the EPA Air Toxics website (http://www.epa.gov/ttnatw01/hlthef/arsenic.html), "Acute (short-term) high-level inhalation exposure to arsenic dust or fumes has resulted in gastrointestinal effects (nausea, diarrhea, abdominal pain); central and peripheral nervous system disorders have occurred in workers acutely exposed to inorganic arsenic. Chronic (long-term) inhalation exposure to inorganic arsenic of humans is associated with irritation of the skin and mucous membranes and effects in the brain and nervous system. Chronic oral exposure to elevated levels of inorganic arsenic has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyperpigmentation, and liver or kidney damage in humans. Inorganic arsenic exposure of humans, by the inhalation route, has been shown to be strongly associated with lung cancer, while ingestion of inorganic arsenic by humans has been linked to a form of skin cancer and also to bladder, liver and lung cancer. The EPA has classified inorganic arsenic as a known human carcinogen."

In order to be protective of both human health and the environment, the OSC solicited input from the EPA Region 4 Office of Technical Services (OTS). The following cleanup criteria has been developed for this time-critical removal action:

Residential Property:

Areas found to have arsenic concentrations at the surface at 68 mg/kg or above will be excavated to a depth of 1.5 feet below land surface (BLS) and backfilled with clean soil.

Non-Residential Property:

Areas found to have arsenic concentrations at the surface at 420 mg/kg or above will be excavated to a depth of 1.5 feet BLS.

These cleanup goals for soil removal are based on limiting the excess cancer risk associated with potential exposure to arsenic to a probability of less than 1 in 10,000 people. (1×10^{-4}).

In addition, there is a segment of the dry creek bed along the northern boundary of the Site that is significantly contaminated with arsenic. In order to be protective of species inhabiting this area, an 800-foot segment will be excavated to an average residual arsenic concentration of 50 mg/kg in creek sediments. The parallel goal will be to remove arsenic-contaminated creek sediments such that the WQC of < 0.340 mg/l of arsenic in surface water is attained.

The two risk memos which detail the basis for selection of the cleanup criteria for this Site are provided as Attachment C to this Action Memorandum.

300.415(b)(2)(ii): Actual or potential contamination of drinking water supplies or sensitive ecosystems.

Although there are no known private well users in the vicinity of the Site, there is documented evidence of a drinking water well on the Wiley Property. It is unknown whether the arsenic contamination has migrated downward to an extent where the drinking water supply would be impacted, but the potential is there due to the high concentrations of arsenic at the surface.

300.415(b)(2)(iv): High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

The evidence of arsenic migration at the surface is documented by the discovery that arsenic wastes were discovered at distances of up to 1,800 feet away from the source area in creek sediments.

300.415(b)(2)(v): Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

The arsenic deposited at the surface is in a physical state that would allow migration to other areas via runoff from significant rain events and high winds.

300.415(b)(2)(vii): The availability of other appropriate federal or state response mechanisms to respond to the release.

At this time, there are no other federal or state government mechanisms that are able to respond to this incident in a timely manner and with the resources needed to assume the cleanup.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the Removal Action described in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The proposed actions are designed to mitigate the current and on-going releases of hazardous substances from the Site, as follows:

a. Remove stockpiled waste materials and dispose of at an approved hazardous waste management facility.
b. Excavate soils on the residential property to an approximate depth of 1.5 feet BLS where arsenic concentrations at the surface are at 68 mg/kg or above and dispose of at a permitted off-site facility.
c. Excavate soils on the non-residential property to an approximate depth of 1.5 feet BLS where arsenic concentrations at the surface are at 420 mg/kg or above and dispose of at a permitted off-site facility.
d. Excavate sediments along an 800-foot segment of the dry creek bed draining the Site along its northern boundary. Excavation will be carried out along this segment until a residual arsenic concentration of 50 mg/kg and compliance with the WQC of 0.340 mg/l for acute toxicity is achieved.
e. Backfill excavated areas on the residential property with clean soil to re-establish vegetative cover and re-grade the areas to promote positive drainage.
f. Re-establish vegetative cover on the non-residential property and re-grade the area to promote positive drainage.

(Note: Please see Attachment D to this Action Memorandum for a map showing the proposed locations of soil and sediment removal at the Site.)

2. Post-Removal Site Controls

This removal action will not require post-removal site controls.

3. Contribution to Remedial Performance

The proposed removal action is intended to mitigate immediate threats to human health and the environment posed by this Site. The removal action proposed by the EPA will not impede future remedial investigations or responses.

4. Description of Alternative Technologies

No alternative technologies are currently proposed for this removal action.

5. EE/CA

The proposed actions herein are considered time-critical, and hence, no EE/CA is required.

6. Applicable or Relevant and Appropriate Requirements (ARARs)

In accordance with the NCP at 40 CFR Section 300.415(j), on-site removal actions conducted under the CERCLA are required to attain applicable or relevant and appropriate requirements (ARAR) to the extent practicable considering the exigencies of the situation or provide grounds for invoking a CERCLA waiver under Section 121(d)(4). In determining whether compliance with ARARs is practicable; the lead agency may consider appropriate factors, including (1) the urgency of the situation; and (2) scope of the removal action to be conducted. Additionally, under 40 CFR Section 300.405(g)(3), other advisories, criteria, or guidance may also be considered (so-called To-Be-Considered or TBC) when conducting the removal action. The site-specific ARARs for this time-critical removal action are listed in Attachment E.

Under CERCLA Section 121(e)(1), federal, state or local permits are not required for the portion of any removal or remedial action conducted entirely on-site as defined in 40 CFR Section 300.5. See also 40 CFR Section 300.400(e)(1) & (2). On-site means the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action. On-site response actions must comply, to the extent practicable, with substantive but not administrative requirements of ARARs. Off-site activities such as transportation and disposal of wastes are required to comply with all applicable requirements, including the administrative portions.

As provided in CERCLA Section 121(d)(3) and the Off-site Rule at 40 CFR Section 300.440 *et seq.*, the off-site transfer of any hazardous substance, pollutant or contaminant generated during the response action will be sent to a treatment, storage or disposal facility that is in compliance with applicable federal and state laws and has been approved by the EPA for acceptance of CERCLA waste.

A letter was sent to the Commonwealth of Kentucky on February 25, 2016, requesting identification of any State ARARs for the EPA's consideration prior to continuation of a response action at the Site.

7. **Project schedule**

The removal action will begin as soon as possible after authorization is received to conduct the removal action. It is anticipated that the field work will take approximately 30 days to complete from initiation of soil removal on the residential properties.

B. **Estimated Costs**

Extramural Cost Description	Current Ceiling	Increased Costs	Proposed Ceiling
Regional Removal Allowance Costs:			
Total Cleanup Contractor Costs: (ERRS costs plus 15% contingency)	$ 50,000	$1,400,000	$1,450,000
Other Extramural Costs Not Funded from the Regional Allowance:			
Total START, including multiplier costs	$ 0	$ 100,000	$ 100,000
Subtotal, Extramural Costs	$ 50,000	$1,500,000	$1,550,000
Extramural Costs Contingency (20% of Subtotal, Extramural Costs; round to nearest thousand)		+ $ 300,000	
TOTAL, REMOVAL ACTION PROJECT CEILING	$ 50,000	$1,800,000	$1,850,000

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

A delay in action or no action at this Site would increase the actual or potential threats to the public health and/or the environment.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

A confidential Enforcement Addendum is included with this Action Memorandum as Attachment F.

The total EPA costs for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated at:

Total Removal Project Ceiling	$1,850,000.00
EPA's Direct Intramural Costs	$70,000.00
Subtotal	$1,920,000.00
Regional Indirect Cost (55.33%)*	$1,062,336.00
ESTIMATED TOTAL EPA COSTS	**$2,982,336.00**

IX. RECOMMENDATION

This decision document represents the selected Removal Action for the Wiley Property Site in Hartford, Ohio County, Kentucky, developed in accordance with CERCLA, as amended, and consistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP Section 300.415(b)(2) criteria for a removal, and I recommend your approval of the proposed Removal Action. The total project ceiling if approved will be $1,850,000. This includes the costs for all the actions contemplated in this Action Memorandum. Of this, an estimated $1,450,000 comes from the Regional Removal Allowance.

APPROVED: _____ DATE: 6/22/16
Franklin E. Hill, Director
for Superfund Division

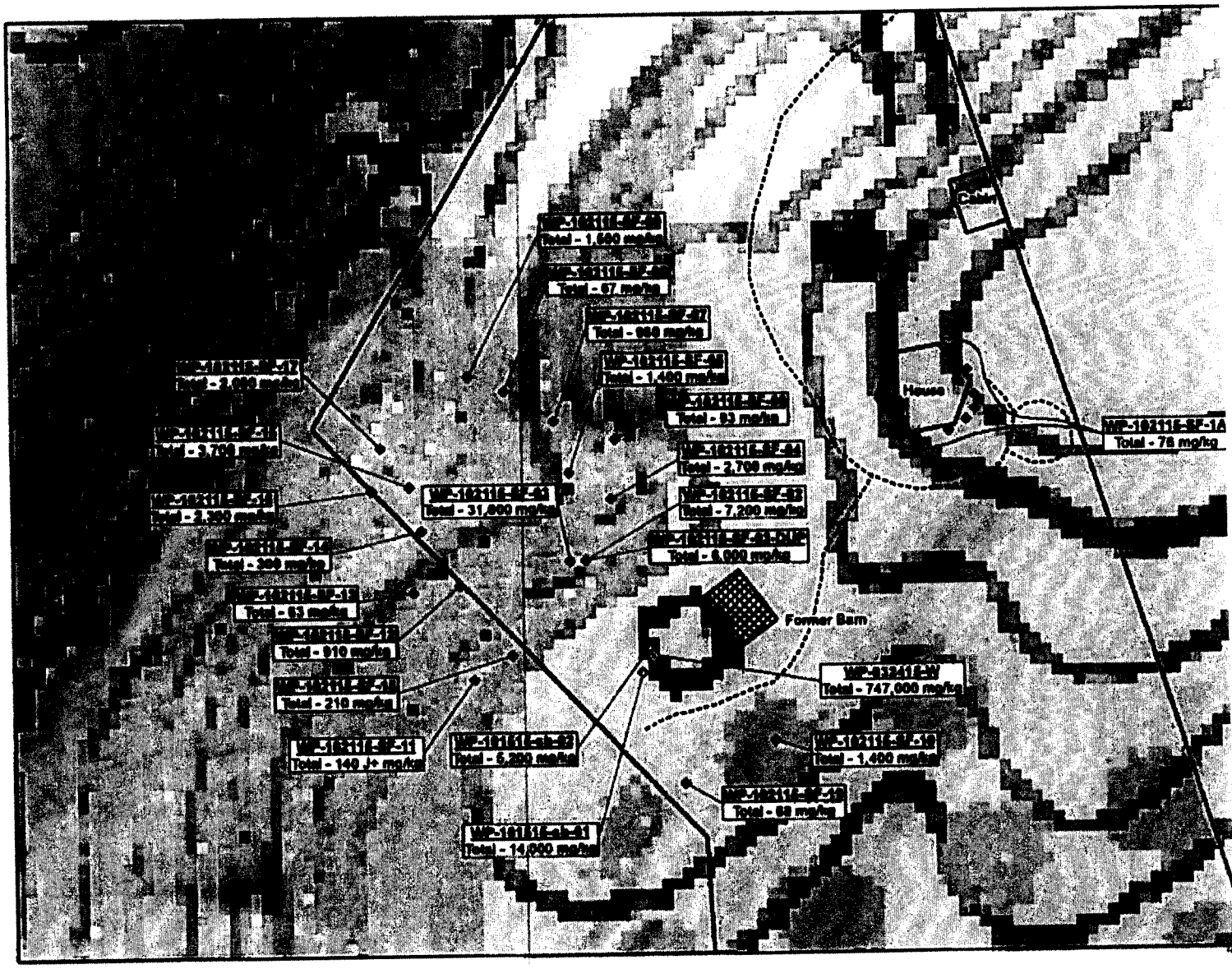
DISAPPROVED: _____ DATE: _____
Franklin E. Hill, Director
Superfund Division

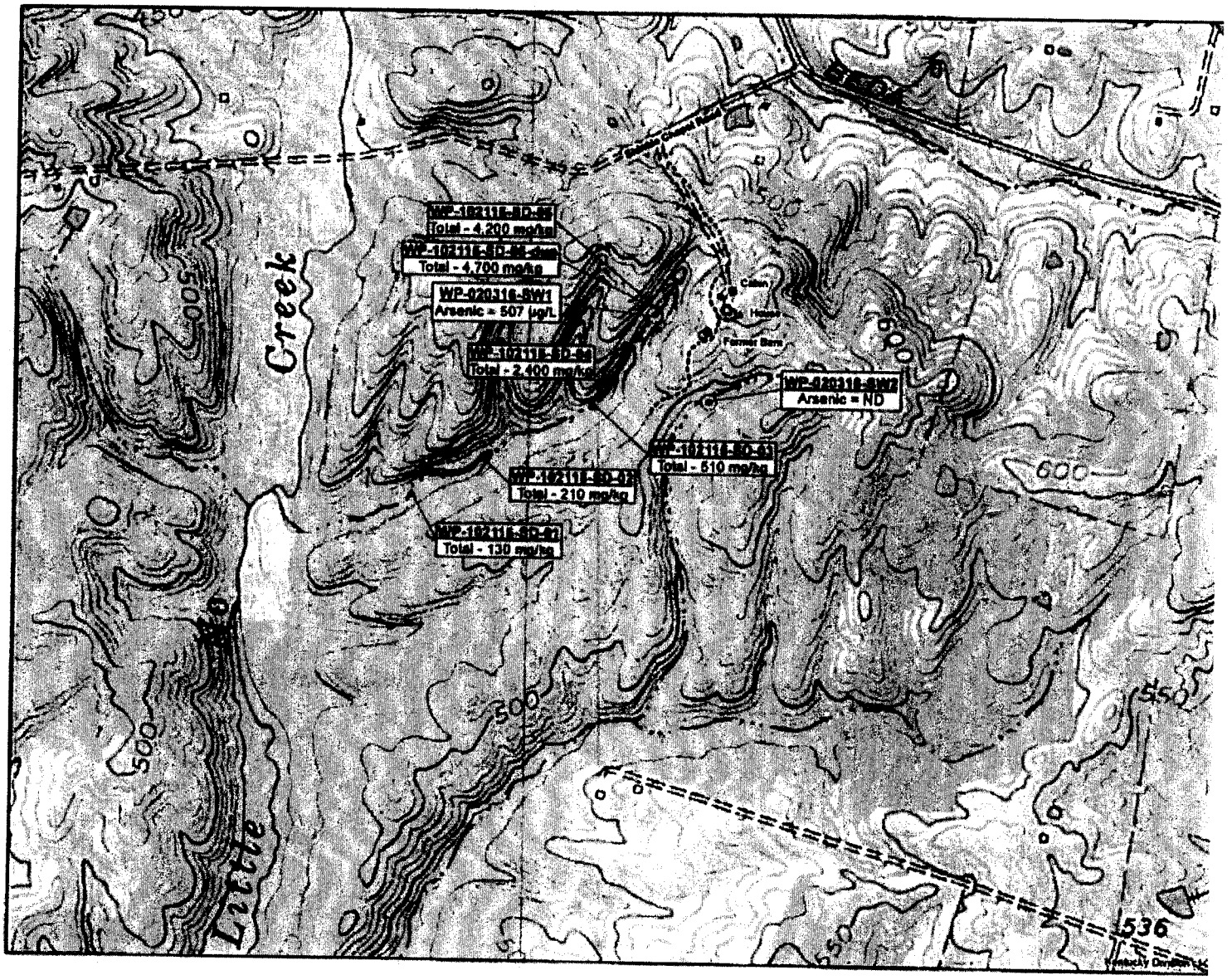
Attachments

*Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of the removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of total cost estimates nor deviation of actual costs from this estimate will affect the United States' right to cost recovery.

ATTACHMENT A

Site Maps


Total - 1,600 mg/kg
Total - 67 mg/kg
Total - 980 mg/kg
Total - 1,400 mg/kg
Total - 93 mg/kg
Total - 2,700 mg/kg
Total - 31,000 mg/kg
Total - 7,200 mg/kg
Total - 6,000 mg/kg
Total - 300 mg/kg
Total - 63 mg/kg
Total - 910 mg/kg
Total - 210 mg/kg
Total - 140 J+ mg/kg
Total - 6,200 mg/kg
Total - 14,000 mg/kg
Total - 747,000 mg/kg
Total - 1,400 mg/kg
Total - 68 mg/kg
Total - 78 mg/kg
Former Barn
House


Total - 4,200 mg/kg
Total - 4,700 mg/kg
WP-020318-SW1
Arsenic = 507 µg/L
Total - 2,400 mg/kg
Arsenic = ND
Total - 510 mg/kg
Total - 210 mg/kg
Total - 130 mg/kg
Cabin
House
Former Barn
Creek
Little
500
600
550
536

ATTACHMENT B

$50k Action Memo

September 1, 2015

4WD-ERRPB

ACTION MEMORANDUM

SUBJECT: Action Memorandum for a Removal Action at the Wiley Property Site pursuant to the On-Scene Coordinator's delegated authority under CERCLA Section 104.

FROM: Art Smith, On-Scene Coordinator (OSC)
Emergency Response and Removal Branch

THRU: James Webster, Chief
Emergency Response, Removal and Prevention Branch

TO: Site File

I. Purpose

The purpose of this Action Memorandum is to document the decision to initiate the time-critical removal action described herein for the Wiley Property Site (the Site) located in Hartford, Ohio County, Kentucky. This removal action is pursuant to the OSC's $50,000 programmatic authority under CERCLA Regional Delegation 14-2 for a time-critical removal action where site conditions do not constitute an emergency.

II. Site Information

A. Site Description

Site Name: Wiley Property
Superfund Site ID (SSID): B45H
NRC Case Number: None
CERCLIS Number: KYN000403430
Site Location: Shinkle Chapel Road, Hartford, KY 40210
Lat/Long: 37.5123000° North 86.9653010° West
Potentially Responsible Party (PRP): Unknown
NPL Status: Non-NPL

B. Site Background

1. Removal Site Evaluation

In August 2014, the last known occupant of the residence at 209 Shinkle Chapel Road contacted the Kentucky Department for Environmental Protection (KDEP) with a concern about an unknown white powdery substance at the Site. KDEP reported that the former occupant bred dogs at the Site and that the females were found to be sterile while others suffered from tumors. The former occupant was concerned about potential exposure to her family members while they lived at the property.

In September 2014, KDEP performed an initial visual investigation at the Site. They confirmed an area where the white substance was located in an area devoid of vegetation and approximately 30 feet in diameter. Samples were collected in October 2014, and analysis of the samples collected from this area revealed total arsenic at levels up to 525,000 milligrams/kilogram (mg/kg). The Toxicity Characteristic Leaching Procedure (TCLP) was performed on the sample with the highest total arsenic level and the result came back as 618 milligrams/liter (mg/L) leachable arsenic. Additional investigation and sampling in October 2014 documented that the arsenic contamination had migrated downhill a distance of approximately 120 feet to the north and west of the source area.

On November 14, 2104, the KDEP Superfund Branch formally requested that the U.S. EPA conduct a Removal Site Evaluation (RSE) at the Site. On March 24, 2015, the Region 4 Superfund Technical Assistance and Response Team (START) contractor mobilized to the Site to collect samples. The purpose was to confirm the 2014 KDEP findings and to explore the potential for additional migration pathways at the Site. Also, a subset of samples were run for arsenic speciation in an attempt to identify the specific arsenic compound at the Site.

The sample collected from the source area was analyzed for total arsenic and the analysis revealed the concentration of arsenic to be 747,000 mg/kg. The arsenic speciation determined that the arsenic is an arsenite compound (As+3).

Based on this information, the OSC completed the removal site evaluation under 40 CFR Section 300.410, and concluded that the site meets the National Contingency Plan (NCP) criteria for a time-critical removal action.

2. Physical location and Site characteristics

The Site is located on 10.2 acres of property at 209 Shinkle Chapel Road in Hartford, Ohio County, Kentucky. The geographic coordinates of the Site are

37.5123000° North and 86.9653010° West. The Site is bordered to the north by Shinkle Chapel Road, and by wooded, rural, and agricultural lands to the east, south, and west. There are 10 homes located within a half-mile radius of the Site.

The Site has a single family home which is currently unoccupied.

3. Release or threatened release into the environment of a hazardous substance, pollutant or contaminant

Arsenic is a hazardous substance as defined by section 101(14) of CERCLA

III. Threats to Public Health Welfare or the Environment

A. Nature of Actual or Threatened Release of Hazardous Substances, Pollutants or Contaminants.

Threats are present at this Site in the form of potential direct contact with identified hazardous substances due to lack of controls on access. Damage to the single family home documents the fact that trespassing is ongoing and represents the existence of a completed exposure pathway. In addition, the KDEP investigation documented that the arsenic compound has migrated down a hillside toward a surface water feature. There is a threat of a release of arsenic to the nearby stream.

B. Check applicable factors (from 40 CFR 300.415) which were considered in determining the appropriateness of a removal action:

_x_ Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants [300.415(b)(2)(i)].

_x_ Actual or potential contamination of drinking water supplies or sensitive ecosystems [300.415(b)(2)(ii)].

__ Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that pose a threat of release [300.415(b)(2)(iii)].

_x_ High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate [300.415(b)(2)(iv)].

_x_ Weather conditions that may cause hazardous substances or pollutants to migrate or to be released [300.415(b)(2)(v)].

__ Threat of fire or explosion [300.415(b)(2)(vi)].

_x_ The availability of other appropriate federal or state response mechanisms to respond to the release [300.415(b)(2)(vii)].

__ Other situations or factors that may pose threats to the public health or welfare of the United States or the environment [300.415(b)(2)(viii)].

IV. Selected Removal Action and Estimated Costs

A. Situation and Removal Activities to Date

1. Current Situation

The Site is currently unoccupied. The arsenic source is uncovered and exposed to the elements. In addition, arsenic waste has migrated down the hillside away from the source toward a nearby stream.

2. Removal activities to date: None

3. Enforcement

The preliminary title search is inconclusive as to who were the previous owners and operators of the Site during the period when hazardous substances were released to the environment. A full PRP search is currently underway. However, the threats are related to the uncontrolled release of arsenic and its potential to migrate away from the source. The scope of this removal action is limited to controlling the release and migration of arsenic to the environment.

B. Planned Removal Actions

1. Proposed action description

The removal action will involve limited excavation and removal in visibly contaminated areas followed by consolidation and stockpiling of the arsenic compound. The stockpile will be covered and a construction fence installed with signs warning trespassers to stay away. Crushed rock and gravel will also be delivered and placed on the site to construct a clean work area for a decontamination pad and a command post.

2. Contribution to remedial performance

The proposed actions will, to the extent practicable, contribute to the efficient performance of any long-term remedial action at the site.

3. ARARs

Removal actions conducted under CERCLA are required to attain ARARs to the extent practicable. The OSC will consult with KDEP to identify if any ARARs are in effect for this removal action.

4. Project Schedule

The removal action will begin within 72 hours of notification to the OSC that contractual arrangements have been approved and funded. It is expected that the removal activities covered under this Action Memo will be completed within 7-8 working days of mobilization to the Site.

C. **Estimated Costs***

Contractor costs (ERRS/START staff, travel, equipment)	**$43,571**
Other Extramural Costs (Strike Team, other Fed Agencies)	
Contingency costs (up to 20% of subtotal)	**$6,429**
Total Removal Project Ceiling	**$50,000**

*EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA. *

V. **Expected Change in the Situation Should Action Be Delayed or Not Taken**

A delay in action or no action at this Site would increase the actual or potential threats to the public health and/or the environment.

VI. **Outstanding Policy Issues:** None

VII. **Approvals**

This decision document represents the selected removal action for this Site, developed in accordance with CERCLA as amended, and not inconsistent with the National Contingency Plan. This decision is based on the administrative record for the Site.

Conditions at the site meet the NCP section 300.415(b) criteria for a removal action and through this document, I am approving the proposed removal actions. The total project ceiling is $50,000, and this amount will be funded from the Regional removal allowance.

Art Smith

Art Smith
On-Scene Coordinator

9/1/2015
Date

ATTACHMENT C

Risk Memos

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

April 12, 2016

4SD-SSB

MEMORANDUM

SUBJECT: Clean Up Goal Options, Wiley Property, Hartford, Kentucky

FROM: Tim Frederick, Life Scientist
Technical Services Section TAF
Superfund Division

TO: Art Smith, On-Scene Coordinator
Emergency Response & Removal Branch
Superfund Division

THRU: Glenn Adams, Chief
Technical Services Section
Superfund Division

Per your request, the Scientific Support Section has reviewed site data and other considerations to assist in the development and selection of clean-up goals for arsenic at the Wiley Property and adjacent parcels.

For the Wiley Property, residential risk-based soil clean up values were calculated that correspond to various excess lifetime cancer risk (ELCR) and a Hazard Index (HI) targets using default exposure factors.

Residential Arsenic Clean Up Levels (in mg/kg)	
ELCR	
1E-4	68
1E-5	6.8
1E-6	0.68
Hazard Index	
HI = 1	35
HI = 3	100

For the adjacent properties, site-specific clean-up goals were calculated based upon presumption of recreational land use. Site visitors were assumed to visit once a week for 50 weeks/year. Visitors were assumed to spend an hour each visit near the soil/sediments, except for the adolescent group that were assumed to spend two hours. See attached PDF with all calculations and exposure inputs. Cleanup levels were calculated to meet various ELCR and HI criteria and provided in the table below.

Recreational Arsenic Clean Up Levels (in mg/kg)	
ELCR	
1E-4	420
1E-5	42
1E-6	4.2
Hazard Index	
HI = 1	245
HI = 3	735

Please contact me at 404-562-8596 or frederick.tim@epa.gov if you have any comments or questions regarding this memorandum.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

April 05, 2016

4SFD-SRSIB

MEMORANDUM

SUBJECT: Brief Ecological Risk Assessment for the Arsenic Contamination in the "Dry Creek Channel" in the Drainage Pathway of the Wiley Property in Hartford, Kentucky

FROM: Brett Thomas, Ph.D., Life Scientist BVT
Scientific Services Section
Superfund Division, Superfund Resource and Scientific Integrity Branch

THRU: Glenn Adams, Chief, Scientific Services Section

TO: Art Smith, On-Scene Coordinator, Superfund Division

Per your request, I have estimated risks to wildlife from the residual arsenic in the dry creek channel/bed in the drainage pathway draining the Wiley Property in Hartford, Kentucky. The purpose was to determine if ecological risks could be posed by the residual arsenic in the surface soils of the dry creek bed, and to approximate an arsenic surface soil cleanup value that is reasonably protective of wildlife. It is understood that the soils upland of the dry creek bed will be remediated to a concentration likely protective of wildlife in the area, therefore these upland soils will not be included in the risk assessment.

It is assumed from reading the provided material that the "dry creek bed" runoff pathway that was sampled is not usually filled with water, but is usually dry. It sounded like it was dry when the samples were taken, and the pictures provided also indicate this was and often is the case. In this situation, I would view the dry creek bed exposures more as exposures to soil than sediment, as periodic inundation will not lend itself to an aquatic community forming. This is just an assumption as I have not seen the area.

The segment of the stream bed that was sampled, according to Figure 2, looks to be about 1800 feet long and from the pictures I saw maybe 10 feet wide. The channel bed appears to have a lot of leaf litter, and as such especially when it gets damp it would be a good place for wildlife foraging.

So it likely is decent and attractive wildlife habitat. At 1800 feet long and 10 feet wide, that gives approximately 0.4 acres or 0.17 hectares of area for the stream channel.

For conservative exposure and risk estimates, I will use as representative receptors a small mammal (shrew) and an insectivorous bird (American Robin). The exposure parameters for these receptors are given below:

American Robin: Food Ingestion Rate (FIR) = 1.52 kg wet food/kg BW-d; Incidental soil ingestion = 0.05 x dw FIR = 0.05 x (0.2 x FIR); Water ingestion rate is NA for this assessment; home range = 0.16 ha so Area Use Factor = 1.0; LOAEL TRV for As = 3.55 mg/kg BW-d

Shrew: Food Ingestion Rate (FIR) = 0.81 kg wet food/kg BW-d; Incidental soil ingestion = 0.037 x dw FIR = 0.037 x (0.2 x FIR); Water ingestion rate is NA for this assessment; home range = 0.39 ha so Area Use Factor = 0.44; LOAEL TRV for As = 1.26 mg/kg BW-d

Risk Calculations: Arsenic ingestion = amount eaten via food ingestion + amount in incidentally ingested soil = [FIR x food As conc] + [soil ing rate x 0.2 x FIR x soil As conc] = [FIR x soil As conc x BSAF] + [soil ing rate x 0.2 x FIR x soil As conc]

The soil to earthworm accumulation estimation equation to calculate an earthworm arsenic concentration was obtained from the Eco SSL Attachment 4-1 document. From the Eco-SSL Attachment 4-1, the Uptake Equation for arsenic from soil into earthworms is:

$\ln(Ce) = 0.706 * \ln(Cs) - 1.421$

Ce is the concentration of As in earthworms in mg/kg dry weight
Cs is the concentration of As in the soil in mg/kg dry weight

---

For the estimated soil arsenic concentrations in the dry creek channel, only the lab measured data from Figure 2 were used, and ProUCL 5.0 was used for the calculations. The arsenic concentrations in soil used for the 95% UCL and mean calculations were (upstream to downstream): 4700 mg/kg, 2400 mg/kg, 510 mg/kg, 210 mg/kg and 130 mg/kg. The 95% UCL arsenic concentration was calculated as 3469 mg/kg, and the mean arsenic soil concentration was calculated as 1590 mg/kg.

Using the ecological receptors, exposure parameters and information above, screening ecological risks for exposure to just the dry creek channel soils were calculated.

Dry Creek Channel only risk calculation results:

	Arsenic LOAEL-based Hazard Quotients		
	95% UCL As soil conc estimate = 3469 mg/kg	Mean As soil conc estimate = 1590 mg/kg	Approximate Soil As conc in mg/kg for HQ=1
Robin	17	9	150
Shrew	21	11	100

As stated above, these results are fairly conservative and are based upon a lot of estimation. Nonetheless, the results indicate that there could be significant risk to small home range wildlife that may use the dry creek channel for feeding. The column to the far right is the arsenic soil concentration that when used in the risk calculation for each receptor gives an HQ of 1, which would indicate no likelihood of risk. Wildlife with broader home ranges would be at less risk than the two receptors used, though the high hazard quotients indicate that risk might still be present for these wider ranging receptors at the current soil arsenic concentrations. Using these alternate receptors would depend on what degree of conservatism is desired for the final protectiveness for wildlife using the dry creek channel.

To estimate very approximate cleanup values that would be generally protective of wildlife in the area, I assumed as a starting point that the upper half of the dry creek channel was remediated, so that the 510, 2400 and 4700 mg/kg samples were each 50 mg As/kg as a residual. I calculated the resulting residual arsenic concentrations for the channel segment that was sampled and the associated risk values, and they are in the table below. The results indicate that this type of an action, as an example, should result in no appreciable risk remaining for avian and mammalian ecological receptors exposed to the dry creek channel.

Dry Creek Channel only risk calculation results, after theoretical remediation halfway down the segment that has been sampled:

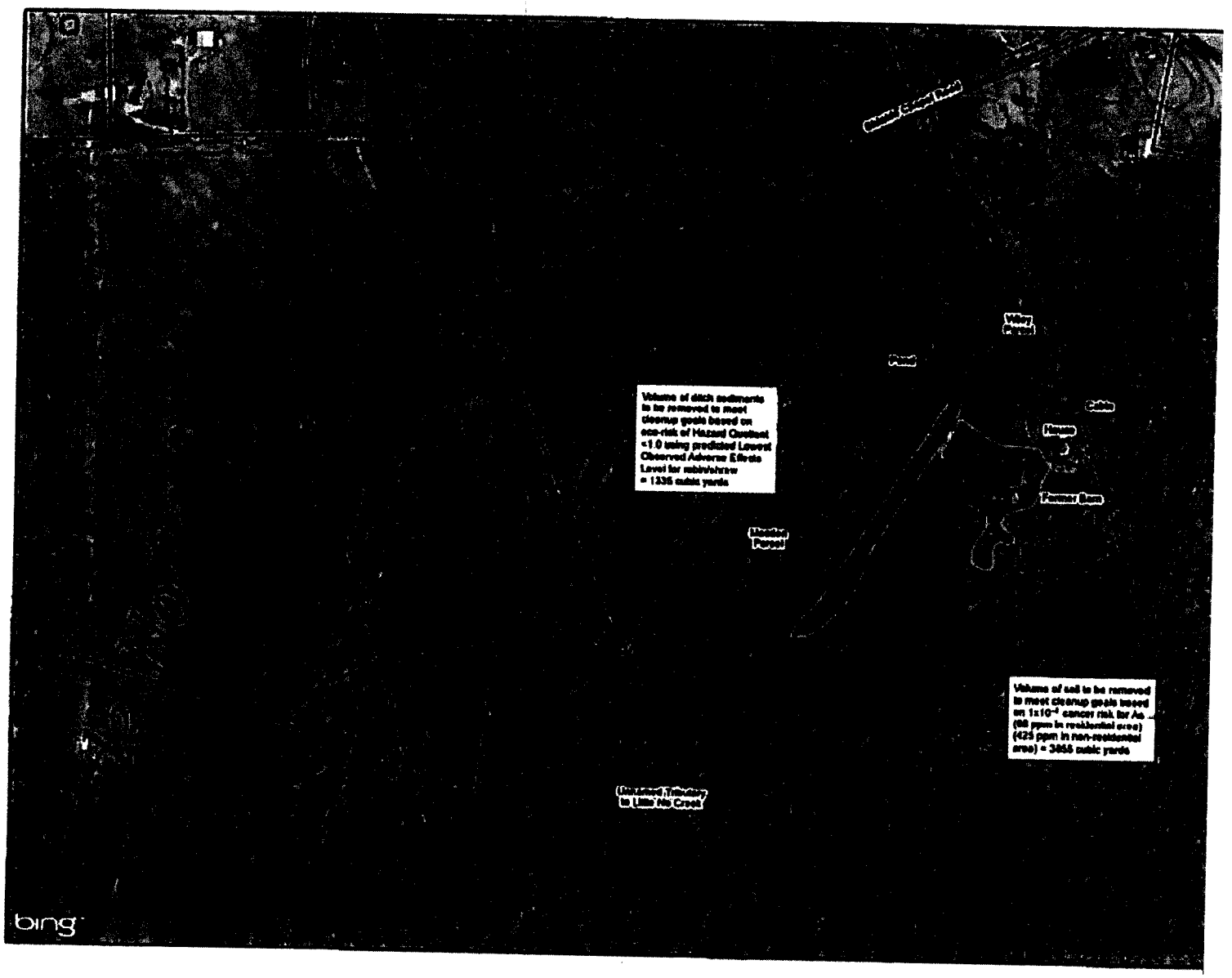
	Arsenic LOAEL-based Hazard Quotients	
	95% UCL As soil conc estimate = 166 mg/kg if upper half of channel remediated	Mean As soil conc estimate = 98 mg/kg if upper half of channel remediated
Robin	1.2	0.8
Shrew	1.5	1.0

Thank you for the opportunity to perform this analysis. Please let me know if you would like to discuss these findings or recommendations. If so, please contact me at (404) 562-8751 or at thomas.brett@epa.gov.

Brett Thomas

ATTACHMENT D

Proposed Locations of Soil and Sediment Removal


Volume of ditch sediments to be removed to meet cleanup goals based on eco-risk of Hazard Quotient <1.0 using predicted Lowest Observed Adverse Effects Level for robin/shrew = 1335 cubic yards
Volume of soil to be removed to meet cleanup goals based on 1x10⁻⁴ cancer risk for As (68 ppm in residential area) (425 ppm in non-residential area) = 3855 cubic yards
Unnamed Tributary to Little No Creek
Cabin
House
Farmer Barn
bing

ATTACHMENT E
Applicable or Relevant and Applicable Requirements (ARARs)

ACTION-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	
FEDERAL				
Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (RCRA Subtitle D)	40 CFR Part 257, Subpart A	Regulates facilities which handle and dispose of solid waste.	Applicable	Applic excava
RCRA Subtitle C	40 CFR Parts 260, 261, and 262 Subpart A	Regulates the determination of whether a solid waste is a hazardous waste.	Applicable	Applic soils ar
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Standards applicable to transporters of hazardous waste	Applicable	Applic charact
Standards Applicable to Management of Hazardous Waste (e.g., excavated soils)	40 CFR Part 264.554	Regulates the storage of remediation waste on-site prior to transportation and disposal	Relevant and Appropriate	Standa of a RC provisi staging approp
Land Disposal Restrictions	40 CFR Part 268	Identifies hazardous wastes that are restricted from land disposal	Applicable	Applic. charact
Standards Applicable to Transportation of Hazardous Materials	40 CFR Part 171.2 and 40 CFR Part 172	Regulates the classification, marking, and shipping of hazardous materials	Applicable	Applic charact
STATE				
Environmental Performance Standards	401 KAR 30:031	Establishes standards for the licensing, locating, constructing, and operating solid waste facilities.	Applicable	Applic excava
Control of Fugitive Dust	401 KAR 63:010 § 3(1) and (1)(a), (b), (d), (e) and (f) and 401 KAR 63:010 § 3 (2)	Regulates fugitive emissions from land-disturbing activities	Applicable	Applic contam

ACTION-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	
Surface Water Standards	401 KAR 5:031	Establishes standards for the prevention, abatement, and control of water pollution	Relevant and Appropriate	Applic facility howev 0.340 n aquatic relevan

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Standard Form 1034
Revised January 1980
Department of the Treasury
ITFRM 4-2000

PUBLIC VOUCHER FOR PURCHASES AND SERVICES OTHER THAN PERSONAL

VOUCHER NO. 9007-03

U.S. DEPARTMENT, BUREAU, OR ESTABLISHMENT AND LOCATION

U. S. Environmental Protection Agency
RTP Financial Management Center
Mail Code -- D143-02
Research Triangle Park, N.C. 27711

DATE VOUCHER PREPARED: 06/09/16

CONTRACT NUMBER AND DATE: EP-S4-15-04 08/24/15

REQUISITION NUMBER AND DATE

SCHEDULE NO.

PAID BY

PAYEE'S NAME AND ADDRESS:
ACH - EPA
ABA Number 042102555
CMC, Inc.
1151 Jessamine Station Rd.
Nicholasville, KY 40356

If questions on this invoice, call 888-854-3732 Janice Willoughby

DATE INVOICE RECEIVED

DISCOUNT TERMS

PAYEE'S ACCOUNT NUMBER: 2000903

SHIPPED FROM | TO | WEIGHT | GOVERNMENT B/L NUMBER

NUMBER AND DATE OF ORDER	DATE OF DELIVERY OR SERVICE	ARTICLES OR SERVICES (Enter description, item number of contract or Federal supply schedule, and other information deemed necessary)	QUANTITY	UNIT COST	PRICE PER	AMOUNT (1)
0007	5/13/2016 Thru 5/13/2016	S41504 - 0007 Wiley Property Site Hartford, Ohio County, KY				$759.57

I certify that all payments requested are for appropriate purposes and in accordance with the agreements set forth in the contract.

Signature: Cody Brown, CPA Title: C.F.O.

(Use continuation sheet(s) if necessary) (Payee must NOT use the space below) TOTAL $759.57

PAYMENT:
- ☐ PROVISIONAL
- ☐ COMPLETE
- ☐ PARTIAL
- ☐ FINAL
- ☐ PROGRESS
- ☐ ADVANCE

APPROVED FOR =$ EXCHANGE RATE =$1.00

2 BY

TITLE

DIFFERENCES

Amount verified; correct for

(Signature or initials)

Pursuant to authority vested in me, I certify that this voucher is correct and proper for payment.

(Date) (Authorized Certifying Officer) 2 (Title)

ACCOUNTING CLASSIFICATION

PAID BY

CHECK NUMBER	ON ACCOUNT OF U.S. TREASURY	CHECK NUMBER	ON (Name of Bank)
CASH	DATE	PAYEE 3	

PER

TITLE

1 When stated in foreign currency, insert name of currency.
2 If the ability to certify and authority to approve are combined in one person, one signature only is necessary; otherwise the approving officer will sign in the space provided, over his official title.
3 When a voucher is receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary", or "Treasurer", as the case may be.

PREVIOUS EDITION USABLE 1034-119-05 NSN 7540-00-900-2234

PRIVACY ACT STATEMENT
The information requested on this form is required under the provisions of 31 U.S.C. 82b and 82c for the purpose of disbursing Federal money. The information requested is to identify the particular creditor and the amounts to be paid. Failure to furnish this information will hinder discharge of the payment obligation.

11042107

CMC, Inc.

Facsimile SF1035 Form

U. S. Environmental Protection Agency
RTP Financial Management Center
Mail Code – D143-02
Research Triangle Park, NC 27703

Date	06/09/16
Invoice No	9007-03
CMC Project No	9007
Contract No	EP-S4-15-04
D. O. Number	0007
SSID	B45H

TERMS: PAYMENT DUE UPON RECEIPT

PROJECT: S41504 - 0007 Wiley Property Site
Hartford, Ohio County, KY

Service Dates for
Performance Period 5/13/2016 - 5/13/2016

CATEGORY	CURRENT	CUMULATIVE
Labor	(b) (4)	(b) (4)
Equipment	(b) (4)	(b) (4)
Other Field Costs		
Analytical	(b) (4)	(b) (4)
Lodging/Per Diems		
Materials		
Other Field Costs		
Subcontract		
Total OFC's	(b) (4)	(b) (4)
TOTAL INVOICE	759.57	26,611.08

Contractor Certification

I hereby certify, to the best of my knowledge and belief, that:

1. In accordance with FAR 52.232-7 that payments to subcontractors and suppliers have been paid and/or will be paid by CMC, Inc., a small business, from the proceeds of the payment covered by this certification, in accordance with subcontract agreements and the requirements of Chapter 39 of Title 31, United States Code.

6-9-16
DATE

Cody Bean, CPA C.F.O.
NAME AND TITLE OF AUTHORIZING REPRESENTATIVE

EPA Representative Certification

I hereby certify, to the best of my knowledge and belief, that the services shown on the invoice have been performed and are accepted.

DATE

NAME AND TITLE OF AUTHORIZING REPRESENTATIVE

Scott, Helen

From: Johnson, Dora Ann
Sent: Friday, June 24, 2016 4:53 PM
To: Scott, Helen
Subject: CMC Invoice #9007-03

Final Invoice Approval Summary

Contract.....: EPS41504
Delivery Order.....: 00007
Invoice Number.....: 9007-03
Barcode.....: B6099151180
Date RTP-FC Recvd Inv: 06/10/2016
Vendor.....: C M C, INC.

Invoice Amount.....: (b) (4) [redacted]
Suspensions:
Net Invoice Amount.:
Potential Discount:
Pay the Vendor.....:

Period of Performance: 05/13/2016-05/13/2016
RTP-FC Payment Tech..: JACQUELINE L. WHITE
Approving Official...: DORA A. JOHNSON

Current Date.....: 06/24/2016
Tech's Phone.....: (b) (4) [redacted]

Lref	DCN	FY	Appro	Bud Org	PRC	Site Proj	Cost Org	BOC	Remaining Amt	Approved Amt.
1	DZ5103	15	T	4AD0E	303DC6	B45HRV00	C001	2505	(b) (4) [redacted]	(b) (4) [redacted]

Your work has been processed. Thank you.
Please PRINT NOW for your records.

Click here to return to Invoice Selection

Please close the browser to logout

Dora Ann Johnson
Team Lead / Project Officer
US EPA, Region IV
SD/RSIB/RMS
Phone: 404-562-8737
Cell: 404-754-6339
Email: Johnson.dora@epa.gov

INVOICE CERTIFICATION REPORT

Site Name: S41504 - 0007 Wiley Property Site

Site Number: B45H

Prime Contractor: CMC, Inc.

Contract Number: EP-S4-15-04

Delivery Order Number: 0007

Invoice Number: 9007-03

From: / /

To: / /

	Certified Cost	Recommended For Payment	Cost Contractor Invoice Cost	Difference
Personnel	(b) (4)	(b) (4)	(b) (4)	(b) (4)
Equipment				
Other Costs				
Total	$759.56	$759.57	$0.00	($759.57)

I certify, to the best of my knowledge and belief, that the services shown on the invoice have been performed and are accepted.

Date

Comments:

CMC, Inc.

06/09/2016 - EPA Date Range Summary

Site No: B45H
Invoice No: 9007-03
Option Period: 1

DO Number: 0007
Region: 04

Site: S41504 - 0007 Wiley Property Site
Location: Hartford, Ohio County, KY
Contract No: EP-S4-15-04

Date Range - From 05/13/2016 to 05/13/2016

Contr	Personnel Hours	Base Cost	G&A %	G&A Amount	Total
Personnel					
CMC4	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4) (b) (4)
Equipment					
CMC4	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4) (b) (4)
Other Field Costs					
CMC4	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4) (b) (4)
Grand Total	9.0	756.94		2.63	759.57

CMC, Inc.

06/09/2016 - EPA Daily Summary

Site No: B45H
Invoice No: 9007-03
Option Period: 1

Region: 04

Site: S41504 - 0007 Wiley Proper
Location: Hartford, Ohio County, KY
Contract No: EP-S4-15-04

Date Range - From 05/13/2016 to 05/13/2016

Date	Ctr	Personnel	Equipment	OFCs	Total
05/13/2016	CMC4 Total	(b) (4) [redacted]	(b) (4) [redacted]	(b) (4) [redacted]	(b) (4) [redacted]
	Grand Total	626.94	55.00	77.63	759.57

CONFIDENTIAL BUSINESS INFORMATION

EPA Daily Detail - Personnel 05/13/2016

SiteNumber: B45H
ProjectName: S41504 - 0007 Wiley Property S
Location: Hartford, Ohio County, KY

Invoice# 9007-03
Region: 04

ContractNumber: EP-S4-15-04
DONumber: 0007
OptionPeriod: 1

Cont	ID	Name	CLIN	RHrs	RRate	RPay	OHrs	ORate	OPay	Key	GAAmt	Total	Svc Date	Adj
CMC4	(b) (4)	Neal, Robbie	S11001	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4)	66	(b) (4)	(b) (4)	5/13/2016	
CMC4 Total														
Daily Total				0.00		0.00	9.00		626.94		0.00	626.94		

6/9/2016 11:23:34 AM

CMC, Inc.

EPA Daily Detail - Equipment 05/13/2016

SiteNumber: B45H

ProjectName: S41504 - 0007 Wiley Property Site

Location: Hartford, Ohio County, KY

Invoice # 9007-03

Region: 04

ContractNumber: EP-S4-15-04

DONumber: 0007

OptionPeriod: 1

Cont	ID	CLIN	Description	Hours	Rate	SubTotal	Key	GAAmt	Total	Svc Date	Adj
CMC4	K10216	01230050	Truck-Pickup-1/2 ton	(b) (4)	(b) (4)	(b) (4)	83	(b) (4)	(b) (4)	5/13/2016	
CMC4 Total											
Daily Total						55.00		0.00	55.00		

OK

CONFIDENTIAL BUSINESS INFORMATION

SiteNumber: B45H
ProjectName: S41504 - 0007 Wiley Property Site
Location: Hartford, Ohio County, KY

Invoice # 9007-03
Region: 04

ContractNumber: EP-S4-15-04
DONumber: 0007
OptionPeriod: 1

Cont	Vendor	Description	Key	Quantity	UnitCost	SubTotal	GAAmt	Total	GA%	Svc Date	Adj
CMC4	VISA (b) (4)	Fuel-K10216	55	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4)	5/13/2016	
CMC4 Total											
Daily Total						75.00	2.63	77.63			

CONFIDENTIAL BUSINESS INFORMATION

EPA STANDARD FORM 1900-55
Personnel Report

US ENVIRONMENTAL PROTECTION AGENCY
HAZARDOUS SUBSTANCE RESPONSE FUND CONTRACTOR RECEIVING REPORT

Date: 05/13/2016

Site: S41504 - 0007 Wiley Property Site Site #:B45H
Contractor: CMC, Inc., Ref# 9007

Delivery Order #: 0007
Contract #: EP-S4-15-04

EMPLOYEE	EMPLOYEE ID	WORK CLASSIFICATION	RCMS #	DAILY HOURS REG	DAILY HOURS OT	RATES REG	RATES OT	LABOR COST	G&A COST	PERSONNEL COST	Cmt	REF #
CMC, Inc.: Neal, Robbie	(b) (4)	Foreman	S1-10-01	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4)	N	66
TOTAL PERSONNEL COST FOR TODAY:									(b) (4)	(b) (4)	(b) (4)	
TOTAL PERSONNEL COST TO DATE:											$10,671.16	

EPA STANDARD FORM 1900-55
Equipment Report

US ENVIRONMENTAL PROTECTION AGENCY
HAZARDOUS SUBSTANCE RESPONSE FUND CONTRACTOR RECEIVING REPORT

Date: 05/13/2016

Site: S41504 - 0007 Wiley Property Site Site #:B45H
Contractor: CMC, Inc., Ref# 9007

Delivery Order #: 0007
Contract #: EP-S4-15-04

EQUIPMENT ITEM	EQUIP ID	RCMS#	SERVICE DATE	HRS	DAILY RATE	RATE TYPE	RATE %	G&A COSTS	TODAY'S COSTS	TOTAL TO DATE	Cmt	REF #
CMC, Inc.: Pickup-1/2 ton	K10216	01-230-050	05/13/16	(b) (4)	(b) (4)	Reg	(b) (4)	(b) (4)	(b) (4)	(b) (4)	N	83
TOTAL EQUIPMENT COST FOR TODAY:								(b) (4)	(b) (4)			
TOTAL EQUIPMENT COST TO DATE:										$5,876.00		

OK

EPA STANDARD FORM 1900-55
Other Field Costs

US ENVIRONMENTAL PROTECTION AGENCY
HAZARDOUS SUBSTANCE RESPONSE FUND CONTRACTOR RECEIVING REPORT

Date: 05/13/2016

Site: S41504 - 0007 Wiley Property Site Site #:B45H
Contractor: CMC, Inc., Ref# 9007

Delivery Order #: 0007
Contract #: EP-S4-15-04

ITEM DESCRIPTION	SERVICE DATE	COST STATUS	COST TYPE	VENDOR	INVOICE #	QTY	UNITS	COST	G&A COST	TOTAL COST	Cmt	REF #
CMC, Inc.:												
Fuel-K10216	05/13/16	Final	Fuel	VISA (b) (4)	(b) (4)	(b) (4)	Gals	(b) (4)	(b) (4)	(b) (4)	Y	55

OK

OTHER FIELD COSTS FOR TODAY (FINAL):			
PENDING TOTAL (ALL):	(b) (4)	(b) (4)	(b) (4)
TOTALS FOR TODAY (including Pending):			
TOTAL OTHER FIELD COSTS TO DATE (including Pending):			$10,063.87

EPA STANDARD FORM 1900-55 Comments and Daily Totals	US ENVIRONMENTAL PROTECTION AGENCY HAZARDOUS SUBSTANCE RESPONSE FUND CONTRACTOR RECEIVING REPORT	Page: 4 Date: 05/13/2016

Site: S41504 - 0007 Wiley Property Site Site #:B45H Contractor: CMC, Inc., Ref# 9007		Delivery Order #: 0007 Contract #: EP-S4-15-04

REF #	COMMENTS
CMT	R. Neal, CMC met with EPA OSC Art Smith to conduct site walk and discuss costs, equipment and timeline for future site activities.
55-O	Service Date: 05/13/16, Vendor: VISA (b) Fuel-K10216: Attached receipt for 31.28 gallons of fuel for K10216 pickup @ (b) (4) gallon on 5/13/16.

* IN THE 'CMT' COLUMN DENOTES A DISPUTED ITEM

PERCENTAGE OF CEILING UTILIZED: 53.22%. DO End Date: 08/23/16

TOTAL DAILY COSTS (excluding Pending):	(b) (4)	TOTAL COSTS TO DATE (including Pending)	$26,811.03
Art Smith	6/7/16	Brenda J. [illegible]	6/3/16
SIGNATURE OF OSC REPRESENTATIVE	DATE	SIGNATURE OF CONTRACTOR'S REPRESENTATIVE	DATE

S41504 - 0007 Wiley Property Site

RCMS Date	Personnel	Equipment	Final OFCs	Pending	Daily Total	Total	Ceiling	Balance	% Remaining
Prior Total	[redacted] (b) (4)	[redacted] (b) (4)	[redacted] (b) (4)	[redacted] (b) (4)	[redacted] (b) (4)	[redacted] (b) (4)			
05/13/2016 Detail Total							[redacted] (b) (4)	[redacted] (b) (4)	[redacted] (b) (4)
TTD:	$10,671.16	$5,876.00	$10,063.87	$0.00	$26,611.03	$26,611.03	$50,000.00	$23,388.97	46.78%

CMC, INC. DAILY WORK ORDER	Date: 5/13/16

	Site Name: Wiley Property
Site No: B45H	
CMC Project No.: 7007	Project Manager: R. Neal
	Contractor: CMC
Approved Hours to be Worked:	

Description of Work to be Performed:

Met with OSC Art Smith Conduct Site Walk

Discuss Cost Equipment & Timeline

Qty.	Job Title		Hours	
	FM	Robbie Neal	(b) (4) [redacted]	

Equipment and Materials

Item	Unit No.	Item	Qty
K- 102116 P/U	1		

COMMENTS:

OSC Signature	CMC Signature

K-10216
Wiley Property

Welcome to
Fastway 7

Fastway 7
720 S. Main St.
Leitchfield KY
42754

DATE 05/13/16 08:59
TRAN# 3022172
PUMP# 02
SERVICE LEVEL: [illegible]
PRODUCT: UNLD
GALLONS: [illegible]
PRICE/G: $ [redacted]
FUEL SALE $ [redacted]
Credit $75.00

VISA [redacted]
XXXXXXXXXXXX[redacted]
Auth #: 703165
Resp Code: 0
Stan: 0058115961
Invoice #: 38581
SITE ID: TP219800540
01

Thank You
Have a nice day

VISA [redacted]

Proj GL No. 9007-000-4303
Billable 75.00 N/B
Other GL No. Unit No. K10216
Invoice No. 38581 1900-55 Date 5/13/16
Voucher No.

Blank Page
C

WILEY PROPERTY
209 SHINKLE CHAPEL Rd.
HARTFORD

10-22-14
R. McGuffe

[redacted]

HOUSE

DRIVE

NORTH

Slope

WATER Hydrant

BARN LOCATION

ARSENIC WASTE SITE

S10

S11

S12

120'

1* S2*

S3* S4*

S5*

S6*

S7*

S9*

S8*

GATE

Dozer Pile

SLOPE

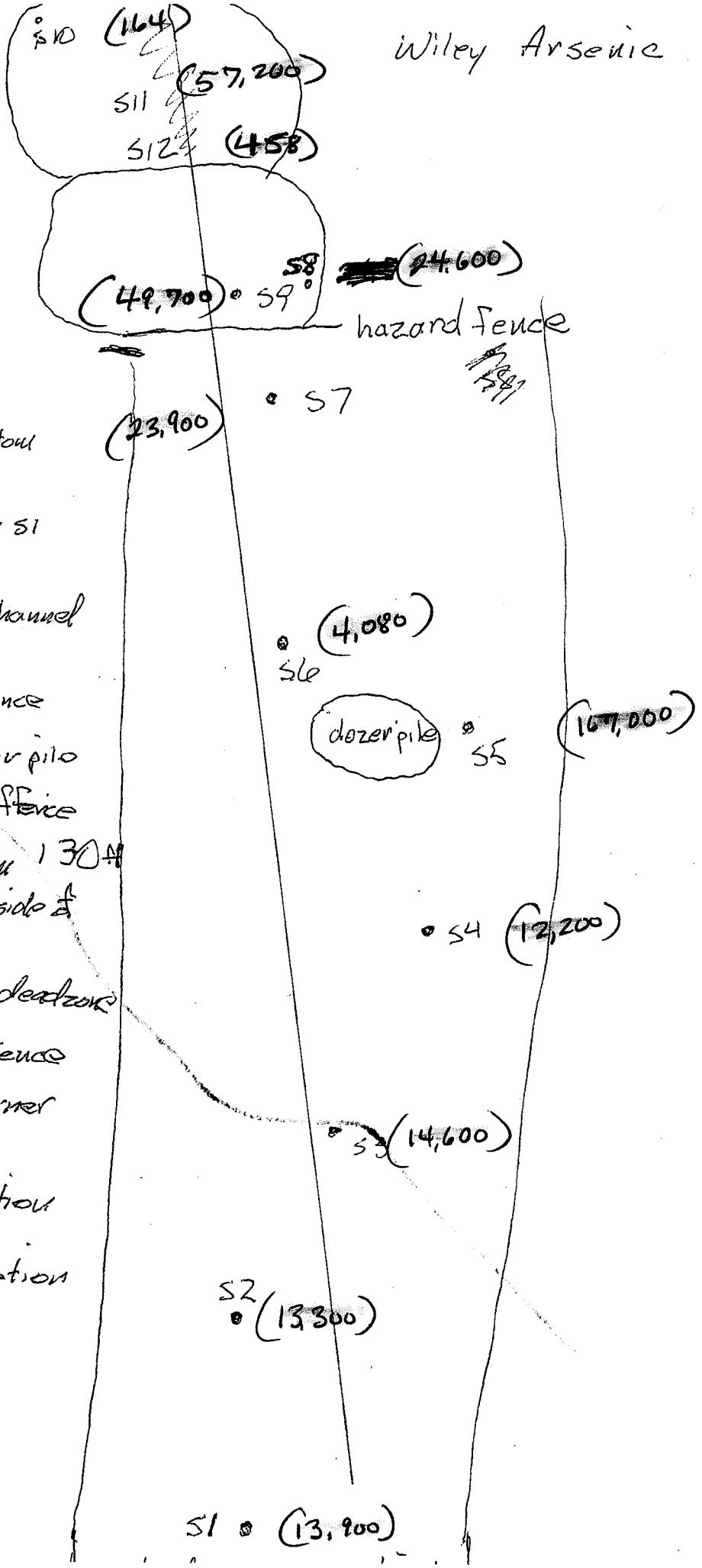
(b) (6)

PROPERTY

11049656

R. Denton

Wiley Arsenic



S1 - 5ft up from bottom of valley

S2 - 20 ft upslope from S1 8ft E of fence

S3 - main drainage channel 1ft W of fence

S4 - 23.5 ft W of fence

S5 - W side of dozer pile

S6 - 3-4 ft W side of fence

S7 - 27 ft down from hazard fence W side of fence 130 ft

S8 W side next to deadzone

S9 W side next to fence

S10 vegetate E corner of building lot

S11 building location

S12 building location

Blank Page

11049651

[redacted]

ENERGY AND ENVIRONMENT CABINET

Steven L. Beshear
Governor

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-2150
FAX (502) 564-4245
www.dep.ky.gov

Leonard K. Peters
Secretary

R. Bruce Scott
Commissioner

MEMORANDUM

TO: Jim McGuire, Removal Manager
Emergency Response and Removal Branch, EPA Region 4

Art Smith, On-Scene Coordinator
EPA Region 4

FROM: Larry D. Hughes, Registered Geologist Branch Manager
Superfund Branch, Kentucky Division of Waste Management (KDWM)

DATE: November 14, 2014

SUBJECT: Request for Time Critical Removal Action
AI# 124089 Wiley Property
Incident # 2381255
209 Shinkle Chapel Rd
Hartford, Ohio County, Kentucky
Latitude: 37.51
Longitude: -86.964722

The KDWM requests that EPA Region 4 take a time-critical removal action at the above reference property in Ohio County, Kentucky. Extraordinarily high levels of arsenic contaminants were identified in the surface soils during two November 2014 reconnaissance and sampling events (10/2/14 and 10/22/14) conducted by the division's Field Operations Branch (FOB). The field reconnaissance and sampling events were based on an original complaint by (b) (6) assigned on 8/26/14 and with initial investigation activities commencing on 9/25/14. The previous property owner was identified as (b) (6)). The initial analytical findings concluded that there are extraordinary concentrations of arsenic present in the surface soils and are also likely at depth and in the surrounding area. These findings require a time-critical action that the Commonwealth of Kentucky is not does not have the resources to conduct to conduct at this time.

Site Investigatory, Reconnaissance and Initial Analytical Findings and History

The Division received a complaint which was forwarded to the Regional Office for investigation. The Complainant indicated that from December of 2008 until November of 2013 she had lived on a 10 acre lot located at 209 Shinkle Chapel Rd near Hartford, Kentucky in Ohio County. The complainant stated that, "...at some point, prior to her living there, a portion of the property was used as a disposal site for some unknown materials. The materials were reportedly kept in a pole barn, which at some point burned to the ground." Little to no vegetation was growing around the disposal area and it was reported that an above ground storage tank was on the property with a white powdery substance around the tank. The Complainant indicated that they bred labradoodles while living on property (approximately 60) and that all the females were sterile and multiple dogs suffered from tumors. The complainant was concerned for her daughter that lived with her on the property at the time who is now 16 years old. The complainant also indicated that Wells Fargo bank now owned the property.

An initial investigation was conducted on 9/25/14 identifying a visible white residue in a circular area approximately 30 feet in diameter. Easily identifiable dead vegetation was observed immediately down gradient in an ephemeral drainage feature up to approximately 75+ feet. This area of Ohio County is in an oil production zone and Google Earth images appeared to indicate roads in the wooded area in a radius pattern indicative of crude oil production. Subsequent historic aerial maps dating back to the 50s and 70s also indicate what appears to be an orchard feature immediately to the east of the site.

After the initial investigation the complainant was contacted by the division's FOB to obtain additional information. The complainant indicated that she saw 2 large tanks next the Shinkle Chapel Road near her old driveway. The complainant also said that they were told of an old barn that had been on the area now assumed to be the primary source zone, and that it had burned down with possible chemical containers inside. The complainant further indicated that years ago someone let a chemical company store materials in the now burned down barn. The decision was made by the division's FOB to collect samples for VOC's, Chlorides, total metals, and RCRA 8 metals and PAHs. This event took place on 10/2/14. These initial samples were collected from four locations within the identified primary source zone. The laboratory immediately contacted the division's FOB via email inquiring about sample locations due to their concern about the exceedingly high levels of arsenic.

The division's FOB branch manager immediately contacted the division's superfund branch manager regarding the information collected. A decision was made to conduct a second sample collection event of surface soils in the visibly distressed and further down gradient ephemeral stream zone. This event was conducted on 10/22/14. During this event a PVA record and deed search was conducted. The second sampling event analysis was expanded to include herbicides and pesticides. Samples were collected from the down gradient zone and one up gradient area approaching the former occupied residence. During this even

two aged, dilapidated, industrial design above ground tanks containing a white substance were identified at a location removed from the residence (Latitude 37° 30′ 55″, Longitude - 86° 58′ 09″). This substance was not sampled during this event.

The findings of the Division's FOB reconnaissance, sampling and subsequent analytical data are that extraordinary concentrations of arsenic are present in the surface soil ranging from 458 to 525,000 and averaging 129,502 ppm (mg/Kg) in the identified primary source zone; ranging from 4,080 to 167,000 and averaging 150,605 ppm (mg/Kg) in the identified immediate linear downgradient drainage feature. These extraordinary arsenic levels in the surface soils were sampled as far downgradient as 120+ feet. One background grab sample, based on visual topography moving toward the former residence, was collected and analyzed. The arsenic levels for this sample were found to be 51 ppm. TCLP analysis was conducted on four of the original 10/2/14 samples collected from the primary source zone - samples A = 361,000, B = 525,000, C = 195,000 & D = 58,000 ppm - and correlated at 246, 618, 385 & 51.4 respectively.

The full nature and extent of the extraordinary arsenic concentrations have not yet been identified concerning its full lateral/aerial and vertical soil extent, nor any potential groundwater impacts. The primary source zone is the immediate source head for an ephemeral stream channel that feeds an intermittent stream channel which finally feeds into a perennial blue line stream.

Site Location

The site is located in Ohio County at 209 Shinkle Chapel Road, Hartford, Kentucky (Latitude: 37.51 Longitude: -86.964722). The residence and primary source zone is located on a 10 acre parcel currently owned by Wells Fargo bank. The immediate and surrounding area is rural, wooded and agricultural.

CERCLA History

No CERCLA history has existed at this site prior to the division's FOB investigation.

Pathways

The soil exposure pathway is the most immediate identifiable pathway of concern. The full extent of this release has not been identified. The groundwater migration pathway was not identified as a concern due to insufficient targets and data. The surface water and sediment transport pathway has been initially identified by readily available maps but has not been analytically evaluated. The air migration pathway was not evaluated other than for on-site workers during sampling events who could be exposed due to particulates when the ground is disturbed. At present the site and residence is abandoned with no fencing or gates to prevent vehicular or pedestrian access. No further evaluation of pathways has been made to date.

Conclusions and Recommendations

Due extraordinarily high levels of arsenic identified in the surface soils, KDWM recommends that EPA conduct time-critical removal actions at the site and that off-site soil sampling and product sampling be conducted at the area where the two above ground tanks containing a white substance were identified. In addition further delineation is recommended to quantify and define the lateral/aerial, subsurface soil vertical extent. Groundwater sampling is recommended due to the extraordinary levels of arsenic found and the silty-sand composition of the soils in the area. While no groundwater users were identified in the area using the Kentucky Geological Survey's data base registry and no homes were readily identifiable using aerial maps, due to its limitations, groundwater use survey of a potential radius should be considered. Furthermore, an on-site domestic use well, indicated as no longer used, exists at the residence and may pose a viable pathway for future years.

KDWM has deemed this a priority site based upon the arsenic concentrations, volume, and exposure potentials; your consideration is appreciated.

e-Attachments:

Complainant: Summary
Analytical: Summary Table
Maps: Site Sketch, Summary Geology, Soil, Historic Aerial
PVA: Deeds, Ownership Information, Ownership Map
Power Point: PPT of site and findings to date

c: Tony Hatton, P.G. Director KDWM
Tim Hubbard, P.G. Asst. Director KDWM
Larry Hughes, P.G. Branch Manger Superfund Branch, KDWM
Cliff Hall, P.G. State Lead Section Supervisor, Superfund Branch, KDWM
Sheri Adkins, P.G. Federal Section Supervisor, Superfund Branch KDWM
Eric Brown, State Lead Section Project Manager, Superfund Branch KDWM

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Region 4 Environmental Protection Agency

Community Interview Questionnaire

Wiley Property Removal Site

Date: Wednesday, 8-10-16 3:00 pm - 4:00

Name: William (Bill) & Janet Gillpop

Address [redacted] (b)(6) Personal Privacy

Phone [redacted] (b)(6) Personal Privacy

Email [redacted] (b)(6) Personal Privacy

1. What do you know about site/residence?

a. Previous use of the property

b. Previous residents

Not much,

2. How have you been able to find out information about the property?

3. Explain to the resident what is happening at the site..... Show them the map.

Gonna take about 18 wks to finish the work. Resident is going to have to wait to remove tree due to state traffic. EPA may have to stop work for a while & restart. 24 hr

4. Would you like to receive more information about this site and what EPA is doing there? If yes, how would you like to receive the information?

a. Mailing list

b. Phone calls

c. Postcards

d. Emails

e. Face-to face

11087015

5. Is there anything in particular that you want or need to know?

6. Are you aware of any community concerns?

Folks are concerned about the roads and in hope of repair after work is done by the State's EPA. Art assured that it would be addressed

7. Are there other folks that you feel we need to talk to in the community about this site.

The Kibbons

8. Are you aware of any local groups addressing the site in any way?

Folks upset about the roads. State's EPA are aware

9. How are your local officials perceived within the community?

10. How do you normally get your information about important issues?

11. What is the most popular newspaper, TV Station, and Radio station?

Messenger - newspaper

12. If needed, where do you think would be a good place to hold a public meeting?

12. Do you have any final questions for us?

Art answered all their questions

13. Provide the resident a copy of the factsheet. (Y) / N

14. ~~Inform the resident of the repository. Y / N~~

Bill indicated that folks working @ the site are very nice and helpful. He does expect the city will repair the road when project is over. Has concerns about a ditch that runs through his property.

Creek rough & comes up fast / took out rd / this time left debris / sediment / state is involved & has contact this resident.

EPA digging out waste & stock piling it They walked up to 209 Shinkle and barn was still in place. Tyler admitted to burning barn down and scraping away reminents / washed into creek.

No way arsenic can effect their property.

state cleaning up along Shinkle road.

Gilber Pelty - ~~[illegible]~~ owns land next to Jones

[redacted] (b)(6) Personal Privacy

owns property of Shinkle Chapel

Region 4 Environmental Protection Agency

Community Interview Questionnaire

Wiley Property Removal Site

Date: Thursday, 8-11-16, 7:00 p.m.

Name: Steven & Terri Kibbons

Addres[redacted] (b)(6) Personal Privacy

Phone: [redacted] (b)(6) Personal Privacy

Email: [redacted] (b)(6) Personal Privacy

1. What do you know about site/residence?

a. Previous use of the property Heard this took place back in 50's decades ago. Atty was paid by Fed Gov't to dispose of it. After barn was removed, as enic was released.

b. Previous residents

2. How have you been able to find out information about the property?

They knew the Wiley's - very unusal. Helped them thru ice storm/she raised

3. Explain to the resident what is happening at the site..... Show them the map.

Found used as insectisides. Overtime sediments will be covered w/clean soil.

4. Would you like to receive more information about this site and what EPA is doing there? If yes, how would you like to receive the information?

a. Mailing list

b. Phone calls

c. Postcards

d. Emails

e. Face-to face

11087017

5. Is there anything in particular that you want or need to know?

Scope of time - 18 weeks

6. Are you aware of any community concerns?

7. Are there other folks that you feel we need to talk to in the community about this site.

Ms. Betty Jean Carson, has property off [redacted] (b)(6) Personal Privacy
Lives in [redacted] (b)(6) Personal Privacy

8. Are you aware of any local groups addressing the site in any way?

9. How are your local officials perceived within the community?

10. How do you normally get your information about important issues?

newspaper, TV, phone, word of mouth, emails

11. What is the most popular newspaper, TV Station, and Radio station?

12. If needed, where do you think would be a good place to hold a public meeting?

Community Center / Living Faith Baptist Church
Steve is point of contact

12. Do you have any final questions for us?

What's is dif. about this arsenic - us - fly ash
this arsenic trioxide - very toxic - almost 25% pure arsenic.

13. Provide the resident a copy of the factsheet. (Y) N

14. ~~Inform the resident of the repository. Y / N~~

Terri will call me back for time on Thursday after she speaks w/ husband.

- Concerns about creek/grands play in that area
majority
state cleanup does effect their property
dish full of water/state did use straw bales
that washed into creek
creek crosses his property
call east/west valley wet → not a free flowing but some
lived here since 1985

State found wiley's tanks
EPA state

Had local science teachers use to sample from
Little Know creek. was before wiley issues.
remediation - what does that mean - risk base

When complete - activities still not recommend w/ clean up
Need to know effort will be made to
address this issue.
possible arsenic in Little No Creek
Question about animal exposure/ all water
sampled shows no arsenic.
ask Eric about soil & surface water sampling
results.
Surprised of how much dirt is gone by state
removal.
Ag

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

ACTION MEMORANDUM

SUBJECT: Request for a Change of Scope and Ceiling Increase for a Removal Action at the Wiley Property Site, Hartford, Ohio County, Kentucky

FROM: Art Smith
On-Scene Coordinator

THRU: James W. Webster, Chief 06/14/2016
Emergency Response, Removal and Prevention Branch

TO: Franklin E. Hill, Director
Superfund Division

I. PURPOSE

The purpose of this Action Memorandum pursuant to Section 104 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) is to request authorization for a change in scope and an increase in the project ceiling for the time-critical removal action initiated previously at the Wiley Property Site (the Site), located in Hartford, Ohio County, Kentucky. The Site continues to pose a threat to public health and the environment that meets the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Section 300.415(b)(2) criteria for removal actions. A change in the scope of the project and a ceiling increase are necessary to complete the removal of contaminated soils at residential locations where arsenic concentrations at the surface exceed the U.S. Environmental Protection Agency's Removal Management Levels (RML) for residential areas.

The new total project ceiling, if approved, will be $1,850,000, of which an estimated $1,450,000 will be funded through the Regional Removal Allowance. This ceiling includes the costs for all the actions contemplated in this Action Memorandum.

II. SITE CONDITIONS AND BACKGROUND

Site ID (SSID):	B45H
CERCLIS ID:	KYN000403430
NPL Status:	Non-NPL
Removal Category:	Time-Critical Removal

11049591

Internet Address (URL) • http://www.epa.gov
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A. Site Description

1. Removal Site Evaluation

In August 2014, the last known occupant of the residence at 209 Shinkle Chapel Road contacted the Kentucky Department for Environmental Protection (KDEP) with a concern about an unknown white powdery substance at the Site. KDEP reported that the former occupant bred dogs at the Site and that the females were found to be sterile while others suffered from tumors. The former occupant was concerned about potential exposure to her family members while they lived at the property.

In September 2014, KDEP performed an initial visual investigation at the Site. They confirmed an area where the white substance was located in an area devoid of vegetation and approximately 30 feet in diameter. Samples were collected in October 2014, and analysis of the samples collected from this area revealed total arsenic at levels up to 525,000 milligrams/kilogram (mg/kg). The Toxicity Characteristic Leaching Procedure (TCLP) was performed on the sample with the highest total arsenic level and the result came back as 618 milligrams/liter (mg/L) leachable arsenic. Additional investigation and sampling in October 2014 documented that the arsenic contamination had migrated downhill a distance of approximately 120 feet to the north and west of the source area.

On November 14, 2014, the KDEP Superfund Branch formally requested that the EPA conduct a Removal Site Evaluation (RSE) at the Site. On March 24, 2015, the Region 4 Superfund Technical Assessment and Response Team (START) contractor mobilized to the Site to collect samples. The purpose was to confirm the 2014 KDEP findings and to explore the potential for additional migration pathways at the Site. Also, a subset of samples were run for arsenic speciation in an attempt to identify the specific arsenic compound at the Site.

The sample collected from the source area was analyzed for total arsenic and the analysis revealed the concentration of arsenic to be 747,000 mg/kg. The arsenic speciation determined that the arsenic is an arsenite compound (As+3).

Based on this information, the On-Scene Coordinator (OSC) completed the RSE under 40 CFR Section 300.410, and concluded that the Site meets the National Contingency Plan (NCP) criteria for a time-critical removal action.

On October 20 and 21, 2015, START's Tetra Tech and OTIE contractors conducted the following sampling activities at the Site:

- X-ray fluorescence (XRF) soil and sediment screening
- Vacuum sampling and air sampling from within the interior of the single family residence

- Surface and subsurface soil sampling at various locations on-site
- Surface sediment sampling from a dry creek bed located directly down-gradient of the source area

All samples collected from the inside of the residence were analyzed for the presence of arsenic and were found to be non-detect.

However, arsenic was detected in sediments along the entire 1,800-foot segment of the dry creek bed that was surveyed in concentrations ranging from 130 mg/kg to 4,200 mg/kg. Approximately 700 feet of the dry creek leading to the confluence with Little No Creek remains uncharacterized due to access issues encountered during the October 2015 sampling investigation.

(See Attachment A for maps detailing the sample locations and results obtained during the RSE).

In February 2016, the OSC directed the OTIE START contractor to collect samples of surface water runoff in the stream beds which drain the Site to the north and south. The surface water sample in the northern drainage feature was revealed to contain 0.507 milligrams per liter (mg/l) of arsenic. This exceeds the Water Quality Criteria (WQC) adopted by the Commonwealth of Kentucky of 0.340 mg/l, based on acute toxicity to aquatic species. The surface water feature in the southern drainage feature was discovered to be non-detect for arsenic.

2. Physical Location and Site Characteristics

The Wiley Property Site consists of two parcels in Hartford, Ohio County, Kentucky. The first tract is designated as Tax/Parcel ID 73-17-1 in the records for Ohio County, KY. This tract comprises 10.2 acres and is located at 209 Shinkle Chapel Road. This property is currently held by Wells Fargo Bank, following a foreclosure and Master Commissioner's sale in 2014. There are two improvements on Tax/Parcel ID 73-17-1: a single family home (currently unoccupied) and an outbuilding.

The second tract making up the Site is designated as Tax/Parcel ID 73-17 in the records for Ohio County, KY. This parcel is privately owned, and a portion of this property was subdivided to sell Parcel 73-17-1 in 2007. There are reports of an old barn on this property which was subsequently destroyed, thus suggesting that the past use of the property was for agricultural purposes.

The Site is bordered to the north by Shinkle Chapel Road, and by wooded, rural and agricultural lands to the east, south and west. There are 10 homes located within a half-mile radius of the Site.

3. Release or Threatened Release Into the Environment of a Hazardous Substance, Pollutant or Contaminant

Part 302.4 of Title 40 of the Code of Federal Regulations lists arsenic as a hazardous substance under section 102(a) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Based on analytical results provided by KDEP, arsenic present at this Site may also be a hazardous waste pursuant to the Resource Conservation and Recovery Act (RCRA) by virtue of its toxicity characteristic (EPA HW No. D004 in 40 CFR § 261.24(b)).

4. NPL Status

The Site is not proposed for the National Priorities List (NPL). The Site was screened for inclusion on the NPL, but it will not score.

B. Other Actions to Date

1. Previous actions

On October 13, 2015, the OSC mobilized to the Site with Emergency and Rapid Response Services (ERRS) contractor CMC, Inc. to begin a time-critical removal action under his $50,000 programmatic authority. Actions taken at that time were focused on consolidation and stockpiling of the arsenic compound. The area was fenced, and signs warning of the arsenic hazard were posted at the Site. The initial Action Memo is provided as Attachment B for reference.

C. State and Local Authorities' Roles

1. State and local actions to date

KDEP's initial referral to the EPA included two former storage tanks which were found abandoned at a nearby location along Shinkle Chapel Road. These tanks were sampled by KDEP and found to contain the same arsenic compound discovered at the Site. In January 2015, KDEP informed the EPA that it will dispose of the arsenic waste found in the two storage tanks. The tanks were removed in March 2015. Subsequently, KDEP has tracked arsenic contamination in sediments in a drainage ditch downstream of the former storage tank location, and is currently developing a remediation plan for that Site.

2. Potential for continued state/local response

As cited previously, KDEP requested that the EPA Region 4 take a time-critical removal action at this Site. State and local agencies do not have sufficient funds to conduct additional site response activities in a timely manner.

III. THREATS TO PUBLIC HEALTH WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

Conditions at the Site may present a threat to public health or welfare, and meet the criteria for initiating a removal action under 40 CFR Section 300.415(b)(2) of the NCP. The following factors from Section 300.415(b)(2) of the NCP form the basis for the EPA's determination of the threat presented, and the appropriate actions to be taken:

300.415(b)(2)(i): Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

Although the home is not presently occupied, the extremely high total arsenic concentrations in the source area constitutes a potential human exposure pathway. As mentioned previously, there is documented evidence of arsenic migration into the home. Furthermore, there are limited controls on access to the Site, and the threat of direct contact with the arsenic compound and potential exposure to animals and the food chain is significant.

According to the EPA Air Toxics website (http://www.epa.gov/ttnatw01/hlthef/arsenic.html), "Acute (short-term) high-level inhalation exposure to arsenic dust or fumes has resulted in gastrointestinal effects (nausea, diarrhea, abdominal pain); central and peripheral nervous system disorders have occurred in workers acutely exposed to inorganic arsenic. Chronic (long-term) inhalation exposure to inorganic arsenic of humans is associated with irritation of the skin and mucous membranes and effects in the brain and nervous system. Chronic oral exposure to elevated levels of inorganic arsenic has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyperpigmentation, and liver or kidney damage in humans. Inorganic arsenic exposure of humans, by the inhalation route, has been shown to be strongly associated with lung cancer, while ingestion of inorganic arsenic by humans has been linked to a form of skin cancer and also to bladder, liver and lung cancer. The EPA has classified inorganic arsenic as a known human carcinogen."

In order to be protective of both human health and the environment, the OSC solicited input from the EPA Region 4 Office of Technical Services (OTS). The following cleanup criteria has been developed for this time-critical removal action:

Residential Property:

Areas found to have arsenic concentrations at the surface at 68 mg/kg or above will be excavated to a depth of 1.5 feet below land surface (BLS) and backfilled with clean soil.

Non-Residential Property:

Areas found to have arsenic concentrations at the surface at 420 mg/kg or above will be excavated to a depth of 1.5 feet BLS.

These cleanup goals for soil removal are based on limiting the excess cancer risk associated with potential exposure to arsenic to a probability of less than 1 in 10,000 people. (1×10^{-4}).

In addition, there is a segment of the dry creek bed along the northern boundary of the Site that is significantly contaminated with arsenic. In order to be protective of species inhabiting this area, an 800-foot segment will be excavated to an average residual arsenic concentration of 50 mg/kg in creek sediments. The parallel goal will be to remove arsenic-contaminated creek sediments such that the WQC of < 0.340 mg/l of arsenic in surface water is attained.

The two risk memos which detail the basis for selection of the cleanup criteria for this Site are provided as Attachment C to this Action Memorandum.

300.415(b)(2)(ii): Actual or potential contamination of drinking water supplies or sensitive ecosystems.

Although there are no known private well users in the vicinity of the Site, there is documented evidence of a drinking water well on the Wiley Property. It is unknown whether the arsenic contamination has migrated downward to an extent where the drinking water supply would be impacted, but the potential is there due to the high concentrations of arsenic at the surface.

300.415(b)(2)(iv): High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

The evidence of arsenic migration at the surface is documented by the discovery that arsenic wastes were discovered at distances of up to 1,800 feet away from the source area in creek sediments.

300.415(b)(2)(v): Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

The arsenic deposited at the surface is in a physical state that would allow migration to other areas via runoff from significant rain events and high winds.

300.415(b)(2)(vii): The availability of other appropriate federal or state response mechanisms to respond to the release.

At this time, there are no other federal or state government mechanisms that are able to respond to this incident in a timely manner and with the resources needed to assume the cleanup.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the Removal Action described in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The proposed actions are designed to mitigate the current and on-going releases of hazardous substances from the Site, as follows:

a. Remove stockpiled waste materials and dispose of at an approved hazardous waste management facility.
b. Excavate soils on the residential property to an approximate depth of 1.5 feet BLS where arsenic concentrations at the surface are at 68 mg/kg or above and dispose of at a permitted off-site facility.
c. Excavate soils on the non-residential property to an approximate depth of 1.5 feet BLS where arsenic concentrations at the surface are at 420 mg/kg or above and dispose of at a permitted off-site facility.
d. Excavate sediments along an 800-foot segment of the dry creek bed draining the Site along its northern boundary. Excavation will be carried out along this segment until a residual arsenic concentration of 50 mg/kg and compliance with the WQC of 0.340 mg/l for acute toxicity is achieved.
e. Backfill excavated areas on the residential property with clean soil to re-establish vegetative cover and re-grade the areas to promote positive drainage.
f. Re-establish vegetative cover on the non-residential property and re-grade the area to promote positive drainage.

(Note: Please see Attachment D to this Action Memorandum for a map showing the proposed locations of soil and sediment removal at the Site.)

2. Post-Removal Site Controls

This removal action will not require post-removal site controls.

3. Contribution to Remedial Performance

The proposed removal action is intended to mitigate immediate threats to human health and the environment posed by this Site. The removal action proposed by the EPA will not impede future remedial investigations or responses.

4. Description of Alternative Technologies

No alternative technologies are currently proposed for this removal action.

5. EE/CA

The proposed actions herein are considered time-critical, and hence, no EE/CA is required.

6. Applicable or Relevant and Appropriate Requirements (ARARs)

In accordance with the NCP at 40 CFR Section 300.415(j), on-site removal actions conducted under the CERCLA are required to attain applicable or relevant and appropriate requirements (ARAR) to the extent practicable considering the exigencies of the situation or provide grounds for invoking a CERCLA waiver under Section 121(d)(4). In determining whether compliance with ARARs is practicable; the lead agency may consider appropriate factors, including (1) the urgency of the situation; and (2) scope of the removal action to be conducted. Additionally, under 40 CFR Section 300.405(g)(3), other advisories, criteria, or guidance may also be considered (so-called To-Be-Considered or TBC) when conducting the removal action. The site-specific ARARs for this time-critical removal action are listed in Attachment E.

Under CERCLA Section 121(e)(1), federal, state or local permits are not required for the portion of any removal or remedial action conducted entirely on-site as defined in 40 CFR Section 300.5. See also 40 CFR Section 300.400(e)(1) & (2). On-site means the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action. On-site response actions must comply, to the extent practicable, with substantive but not administrative requirements of ARARs. Off-site activities such as transportation and disposal of wastes are required to comply with all applicable requirements, including the administrative portions.

As provided in CERCLA Section 121(d)(3) and the Off-site Rule at 40 CFR Section 300.440 *et seq.*, the off-site transfer of any hazardous substance, pollutant or contaminant generated during the response action will be sent to a treatment, storage or disposal facility that is in compliance with applicable federal and state laws and has been approved by the EPA for acceptance of CERCLA waste.

A letter was sent to the Commonwealth of Kentucky on February 25, 2016, requesting identification of any State ARARs for the EPA's consideration prior to continuation of a response action at the Site.

7. **Project schedule**

The removal action will begin as soon as possible after authorization is received to conduct the removal action. It is anticipated that the field work will take approximately 30 days to complete from initiation of soil removal on the residential properties.

B. Estimated Costs

Extramural Cost Description	**Current Ceiling**	**Increased Costs**	**Proposed Ceiling**
Regional Removal Allowance Costs:			
Total Cleanup Contractor Costs: (ERRS costs plus 15% contingency)	**$ 50,000**	**$1,400,000**	**$1,450,000**
Other Extramural Costs Not Funded from the Regional Allowance:			
Total START, including multiplier costs	**$ 0**	**$ 100,000**	**$ 100,000**
Subtotal, Extramural Costs	**$ 50,000**	**$1,500,000**	**$1,550,000**
Extramural Costs Contingency (20% of Subtotal, Extramural Costs; round to nearest thousand)		**+$ 300,000**	
TOTAL, REMOVAL ACTION PROJECT CEILING	**$ 50,000**	**$1,800,000**	**$1,850,000**

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

A delay in action or no action at this Site would increase the actual or potential threats to the public health and/or the environment.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

A confidential Enforcement Addendum is included with this Action Memorandum as Attachment F.

The total EPA costs for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated at:

Total Removal Project Ceiling	$1,850,000.00
EPA's Direct Intramural Costs	$70,000.00
Subtotal	$1,920,000.00
Regional Indirect Cost (55.33%)*	$1,062,336.00
ESTIMATED TOTAL EPA COSTS	**$2,982,336.00**

IX. RECOMMENDATION

This decision document represents the selected Removal Action for the Wiley Property Site in Hartford, Ohio County, Kentucky, developed in accordance with CERCLA, as amended, and consistent with the NCP. This decision is based on the administrative record for the Site.

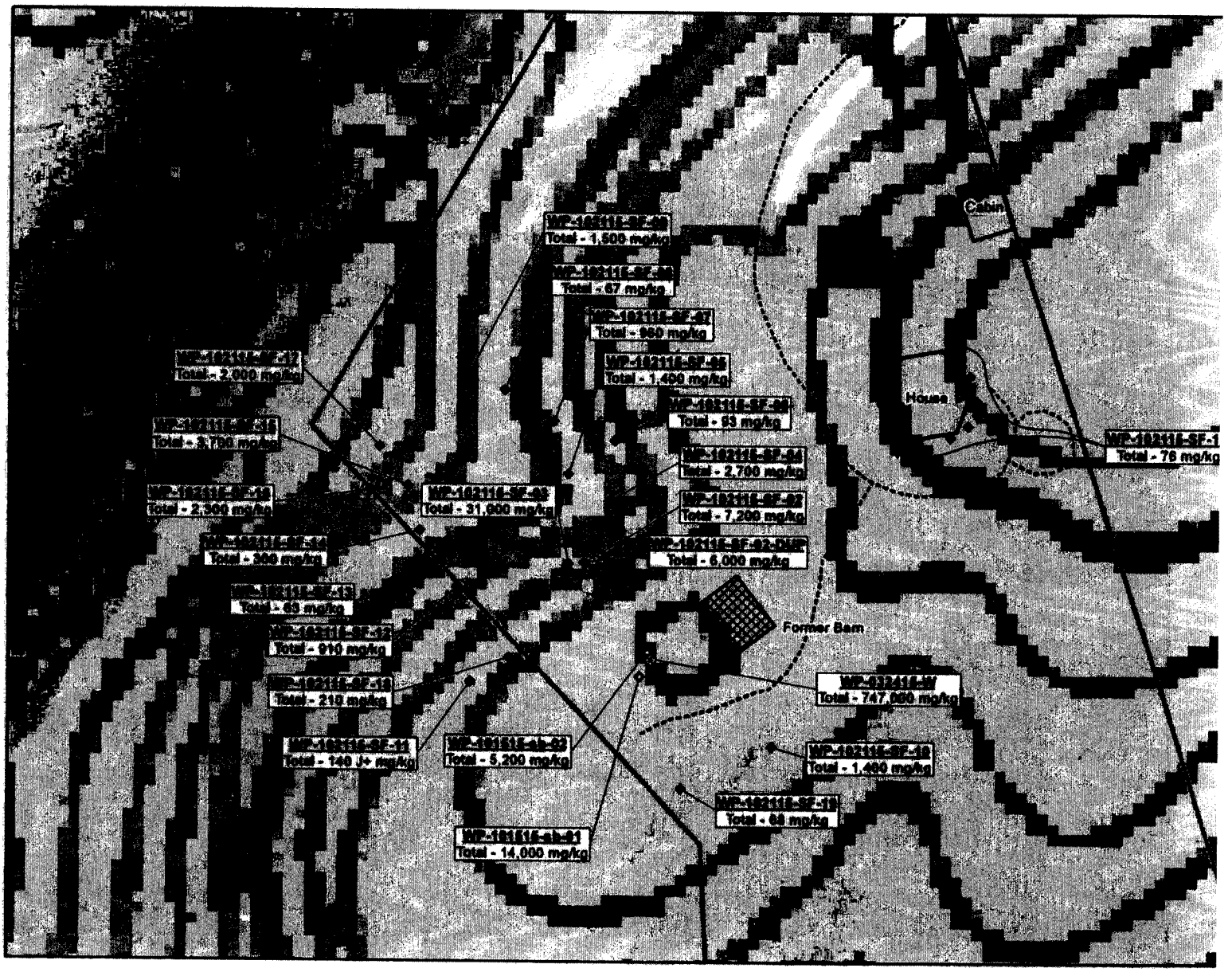
Conditions at the Site meet the NCP Section 300.415(b)(2) criteria for a removal, and I recommend your approval of the proposed Removal Action. The total project ceiling if approved will be $1,850,000. This includes the costs for all the actions contemplated in this Action Memorandum. Of this, an estimated $1,450,000 comes from the Regional Removal Allowance.

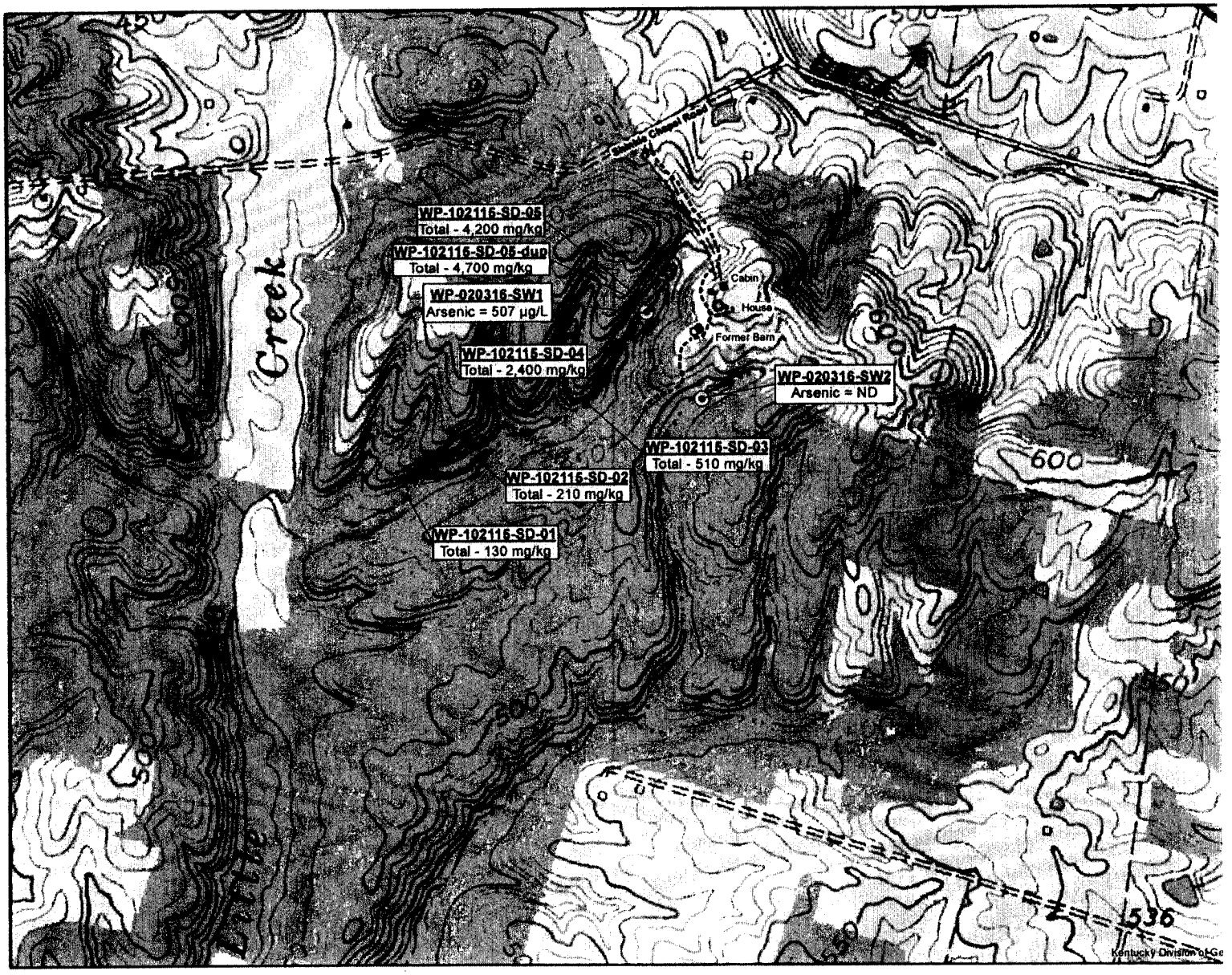
APPROVED: _____ DATE: 6/22/16
Franklin E. Hill, Director
for Superfund Division

DISAPPROVED: _____ DATE: _____
Franklin E. Hill, Director
Superfund Division

Attachments

*Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of the removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of total cost estimates nor deviation of actual costs from this estimate will affect the United States' right to cost recovery.


Total - 1,500 mg/kg
Total - 67 mg/kg
Total - 960 mg/kg
Total - 1,400 mg/kg
Total - 93 mg/kg
Total - 2,700 mg/kg
Total - 31,000 mg/kg
Total - 7,200 mg/kg
Total - 6,000 mg/kg
Total - 910 mg/kg
Total - 210 mg/kg
Total - 140 J+ mg/kg
Total - 5,200 mg/kg
Total - 1,400 mg/kg
Total - 14,000 mg/kg
Total - 76 mg/kg
Cabin
House
Former Barn


WP-102116-SD-05
Total - 4,200 mg/kg
WP-102116-SD-05-dup
Total - 4,700 mg/kg
WP-020316-SW1
Arsenic = 507 µg/L
WP-102116-SD-04
Total - 2,400 mg/kg
WP-020316-SW2
Arsenic = ND
WP-102116-SD-03
Total - 510 mg/kg
WP-102116-SD-02
Total - 210 mg/kg
WP-102116-SD-01
Total - 130 mg/kg
Cabin
House
Former Barn
Creek
Little
600
1536
Kentucky Division of Ge

September 1, 2015

4WD-ERRPB

ACTION MEMORANDUM

SUBJECT: Action Memorandum for a Removal Action at the Wiley Property Site pursuant to the On-Scene Coordinator's delegated authority under CERCLA Section 104.

FROM: Art Smith, On-Scene Coordinator (OSC)
Emergency Response and Removal Branch

THRU: James Webster, Chief
Emergency Response, Removal and Prevention Branch

TO: Site File

I. Purpose

The purpose of this Action Memorandum is to document the decision to initiate the time-critical removal action described herein for the Wiley Property Site (the Site) located in Hartford, Ohio County, Kentucky. This removal action is pursuant to the OSC's $50,000 programmatic authority under CERCLA Regional Delegation 14-2 for a time-critical removal action where site conditions do not constitute an emergency.

II. Site Information

A. Site Description

Site Name: Wiley Property
Superfund Site ID (SSID): B45H
NRC Case Number: None
CERCLIS Number: KYN000403430
Site Location: Shinkle Chapel Road, Hartford, KY 40210
Lat/Long: 37.5123000° North 86.9653010° West
Potentially Responsible Party (PRP): Unknown
NPL Status: Non-NPL

B. Site Background

1. Removal Site Evaluation

In August 2014, the last known occupant of the residence at 209 Shinkle Chapel Road contacted the Kentucky Department for Environmental Protection (KDEP) with a concern about an unknown white powdery substance at the Site. KDEP reported that the former occupant bred dogs at the Site and that the females were found to be sterile while others suffered from tumors. The former occupant was concerned about potential exposure to her family members while they lived at the property.

In September 2014, KDEP performed an initial visual investigation at the Site. They confirmed an area where the white substance was located in an area devoid of vegetation and approximately 30 feet in diameter. Samples were collected in October 2014, and analysis of the samples collected from this area revealed total arsenic at levels up to 525,000 milligrams/kilogram (mg/kg). The Toxicity Characteristic Leaching Procedure (TCLP) was performed on the sample with the highest total arsenic level and the result came back as 618 milligrams/liter (mg/L) leachable arsenic. Additional investigation and sampling in October 2014 documented that the arsenic contamination had migrated downhill a distance of approximately 120 feet to the north and west of the source area.

On November 14, 2104, the KDEP Superfund Branch formally requested that the U.S. EPA conduct a Removal Site Evaluation (RSE) at the Site. On March 24, 2015, the Region 4 Superfund Technical Assistance and Response Team (START) contractor mobilized to the Site to collect samples. The purpose was to confirm the 2014 KDEP findings and to explore the potential for additional migration pathways at the Site. Also, a subset of samples were run for arsenic speciation in an attempt to identify the specific arsenic compound at the Site.

The sample collected from the source area was analyzed for total arsenic and the analysis revealed the concentration of arsenic to be 747,000 mg/kg. The arsenic speciation determined that the arsenic is an arsenite compound (As+3).

Based on this information, the OSC completed the removal site evaluation under 40 CFR Section 300.410, and concluded that the site meets the National Contingency Plan (NCP) criteria for a time-critical removal action.

2. Physical location and Site characteristics

The Site is located on 10.2 acres of property at 209 Shinkle Chapel Road in Hartford, Ohio County, Kentucky. The geographic coordinates of the Site are

37.5123000° North and 86.9653010° West. The Site is bordered to the north by Shinkle Chapel Road, and by wooded, rural, and agricultural lands to the east, south, and west. There are 10 homes located within a half-mile radius of the Site.

The Site has a single family home which is currently unoccupied.

3. Release or threatened release into the environment of a hazardous substance, pollutant or contaminant

Arsenic is a hazardous substance as defined by section 101(14) of CERCLA

III. Threats to Public Health Welfare or the Environment

A. Nature of Actual or Threatened Release of Hazardous Substances, Pollutants or Contaminants.

Threats are present at this Site in the form of potential direct contact with identified hazardous substances due to lack of controls on access. Damage to the single family home documents the fact that trespassing is ongoing and represents the existence of a completed exposure pathway. In addition, the KDEP investigation documented that the arsenic compound has migrated down a hillside toward a surface water feature. There is a threat of a release of arsenic to the nearby stream.

B. Check applicable factors (from 40 CFR 300.415) which were considered in determining the appropriateness of a removal action:

_x_ Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants [300.415(b)(2)(i)].

_x_ Actual or potential contamination of drinking water supplies or sensitive ecosystems [300.415(b)(2)(ii)].

__ Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that pose a threat of release [300.415(b)(2)(iii)].

_x_ High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate [300.415(b)(2)(iv)].

_x_ Weather conditions that may cause hazardous substances or pollutants to migrate or to be released [300.415(b)(2)(v)].

__ Threat of fire or explosion [300.415(b)(2)(vi)].

_x_ The availability of other appropriate federal or state response mechanisms to respond to the release [300.415(b)(2)(vii)].

__ Other situations or factors that may pose threats to the public health or welfare of the United States or the environment [300.415(b)(2)(viii)].

IV. Selected Removal Action and Estimated Costs

A. Situation and Removal Activities to Date

1. Current Situation

The Site is currently unoccupied. The arsenic source is uncovered and exposed to the elements. In addition, arsenic waste has migrated down the hillside away from the source toward a nearby stream.

2. Removal activities to date: None

3. Enforcement

The preliminary title search is inconclusive as to who were the previous owners and operators of the Site during the period when hazardous substances were released to the environment. A full PRP search is currently underway. However, the threats are related to the uncontrolled release of arsenic and its potential to migrate away from the source. The scope of this removal action is limited to controlling the release and migration of arsenic to the environment.

B. Planned Removal Actions

1. Proposed action description

The removal action will involve limited excavation and removal in visibly contaminated areas followed by consolidation and stockpiling of the arsenic compound. The stockpile will be covered and a construction fence installed with signs warning trespassers to stay away. Crushed rock and gravel will also be delivered and placed on the site to construct a clean work area for a decontamination pad and a command post.

2. Contribution to remedial performance

The proposed actions will, to the extent practicable, contribute to the efficient performance of any long-term remedial action at the site.

3. ARARs

Removal actions conducted under CERCLA are required to attain ARARs to the extent practicable. The OSC will consult with KDEP to identify if any ARARs are in effect for this removal action.

4. Project Schedule

The removal action will begin within 72 hours of notification to the OSC that contractual arrangements have been approved and funded. It is expected that the removal activities covered under this Action Memo will be completed within 7-8 working days of mobilization to the Site.

C. Estimated Costs*

Contractor costs (ERRS/START staff, travel, equipment)	**$43,571**
Other Extramural Costs (Strike Team, other Fed Agencies)	
Contingency costs (up to 20% of subtotal)	**$6,429**
Total Removal Project Ceiling	**$50,000**

*EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA. "

V. Expected Change in the Situation Should Action Be Delayed or Not Taken

A delay in action or no action at this Site would increase the actual or potential threats to the public health and/or the environment.

VI. Outstanding Policy Issues: None

VII. Approvals

This decision document represents the selected removal action for this Site, developed in accordance with CERCLA as amended, and not inconsistent with the National Contingency Plan. This decision is based on the administrative record for the Site.

Conditions at the site meet the NCP section 300.415(b) criteria for a removal action and through this document, I am approving the proposed removal actions. The total project ceiling is $50,000, and this amount will be funded from the Regional removal allowance.

Art Smith
On-Scene Coordinator

9/1/2015
Date

ATTACHMENT C

Risk Memos

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

April 12, 2016

4SD-SSB

MEMORANDUM

SUBJECT: Clean Up Goal Options, Wiley Property, Hartford, Kentucky

FROM: Tim Frederick, Life Scientist
Technical Services Section TAF
Superfund Division

TO: Art Smith, On-Scene Coordinator
Emergency Response & Removal Branch
Superfund Division

THRU: Glenn Adams, Chief
Technical Services Section
Superfund Division

Per your request, the Scientific Support Section has reviewed site data and other considerations to assist in the development and selection of clean-up goals for arsenic at the Wiley Property and adjacent parcels.

For the Wiley Property, residential risk-based soil clean up values were calculated that correspond to various excess lifetime cancer risk (ELCR) and a Hazard Index (HI) targets using default exposure factors.

Residential Arsenic Clean Up Levels (in mg/kg)	
ELCR	
1E-4	68
1E-5	6.8
1E-6	0.68
Hazard Index	
HI = 1	35
HI = 3	100

For the adjacent properties, site-specific clean-up goals were calculated based upon presumption of recreational land use. Site visitors were assumed to visit once a week for 50 weeks/year. Visitors were assumed to spend an hour each visit near the soil/sediments, except for the adolescent group that were assumed to spend two hours. See attached PDF with all calculations and exposure inputs. Cleanup levels were calculated to meet various ELCR and HI criteria and provided in the table below.

Recreational Arsenic Clean Up Levels (in mg/kg)	
ELCR	
1E-4	420
1E-5	42
1E-6	4.2
Hazard Index	
HI = 1	245
HI = 3	735

Please contact me at 404-562-8596 or frederick.tim@epa.gov if you have any comments or questions regarding this memorandum.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

April 05, 2016

4SFD-SRSIB

MEMORANDUM

SUBJECT: Brief Ecological Risk Assessment for the Arsenic Contamination in the "Dry Creek Channel" in the Drainage Pathway of the Wiley Property in Hartford, Kentucky

FROM: Brett Thomas, Ph.D., Life Scientist BVT
Scientific Services Section
Superfund Division, Superfund Resource and Scientific Integrity Branch

THRU: Glenn Adams, Chief, Scientific Services Section

TO: Art Smith, On-Scene Coordinator, Superfund Division

Per your request, I have estimated risks to wildlife from the residual arsenic in the dry creek channel/bed in the drainage pathway draining the Wiley Property in Hartford, Kentucky. The purpose was to determine if ecological risks could be posed by the residual arsenic in the surface soils of the dry creek bed, and to approximate an arsenic surface soil cleanup value that is reasonably protective of wildlife. It is understood that the soils upland of the dry creek bed will be remediated to a concentration likely protective of wildlife in the area, therefore these upland soils will not be included in the risk assessment.

It is assumed from reading the provided material that the "dry creek bed" runoff pathway that was sampled is not usually filled with water, but is usually dry. It sounded like it was dry when the samples were taken, and the pictures provided also indicate this was and often is the case. In this situation, I would view the dry creek bed exposures more as exposures to soil than sediment, as periodic inundation will not lend itself to an aquatic community forming. This is just an assumption as I have not seen the area.

The segment of the stream bed that was sampled, according to Figure 2, looks to be about 1800 feet long and from the pictures I saw maybe 10 feet wide. The channel bed appears to have a lot of leaf litter, and as such especially when it gets damp it would be a good place for wildlife foraging.

So it likely is decent and attractive wildlife habitat. At 1800 feet long and 10 feet wide, that gives approximately 0.4 acres or 0.17 hectares of area for the stream channel.

For conservative exposure and risk estimates, I will use as representative receptors a small mammal (shrew) and an insectivorous bird (American Robin). The exposure parameters for these receptors are given below:

American Robin: Food Ingestion Rate (FIR) = 1.52 kg wet food/kg BW-d; Incidental soil ingestion = 0.05 x dw FIR = 0.05 x (0.2 x FIR); Water ingestion rate is NA for this assessment; home range = 0.16 ha so Area Use Factor = 1.0; LOAEL TRV for As = 3.55 mg/kg BW-d

Shrew: Food Ingestion Rate (FIR) = 0.81 kg wet food/kg BW-d; Incidental soil ingestion = 0.037 x dw FIR = 0.037 x (0.2 x FIR); Water ingestion rate is NA for this assessment; home range = 0.39 ha so Area Use Factor = 0.44; LOAEL TRV for As = 1.26 mg/kg BW-d

Risk Calculations: Arsenic ingestion = amount eaten via food ingestion + amount in incidentally ingested soil = [FIR x food As conc] + [soil ing rate x 0.2 x FIR x soil As conc] = [FIR x soil As conc x BSAF] + [soil ing rate x 0.2 x FIR x soil As conc]

The soil to earthworm accumulation estimation equation to calculate an earthworm arsenic concentration was obtained from the Eco SSL Attachment 4-1 document. From the Eco-SSL Attachment 4-1, the Uptake Equation for arsenic from soil into earthworms is:

$$\ln(Ce) = 0.706 * \ln(Cs) - 1.421$$

Ce is the concentration of As in earthworms in mg/kg dry weight
Cs is the concentration of As in the soil in mg/kg dry weight

For the estimated soil arsenic concentrations in the dry creek channel, only the lab measured data from Figure 2 were used, and ProUCL 5.0 was used for the calculations. The arsenic concentrations in soil used for the 95% UCL and mean calculations were (upstream to downstream): 4700 mg/kg, 2400 mg/kg, 510 mg/kg, 210 mg/kg and 130 mg/kg. The 95% UCL arsenic concentration was calculated as 3469 mg/kg, and the mean arsenic soil concentration was calculated as 1590 mg/kg.

Using the ecological receptors, exposure parameters and information above, screening ecological risks for exposure to just the dry creek channel soils were calculated.

Dry Creek Channel only risk calculation results:

	Arsenic LOAEL-based Hazard Quotients		
	95% UCL As soil conc estimate = 3469 mg/kg	Mean As soil conc estimate = 1590 mg/kg	Approximate Soil As conc in mg/kg for HQ=1
Robin	17	9	150
Shrew	21	11	100

As stated above, these results are fairly conservative and are based upon a lot of estimation. Nonetheless, the results indicate that there could be significant risk to small home range wildlife that may use the dry creek channel for feeding. The column to the far right is the arsenic soil concentration that when used in the risk calculation for each receptor gives an HQ of 1, which would indicate no likelihood of risk. Wildlife with broader home ranges would be at less risk than the two receptors used, though the high hazard quotients indicate that risk might still be present for these wider ranging receptors at the current soil arsenic concentrations. Using these alternate receptors would depend on what degree of conservatism is desired for the final protectiveness for wildlife using the dry creek channel.

To estimate very approximate cleanup values that would be generally protective of wildlife in the area, I assumed as a starting point that the upper half of the dry creek channel was remediated, so that the 510, 2400 and 4700 mg/kg samples were each 50 mg As/kg as a residual. I calculated the resulting residual arsenic concentrations for the channel segment that was sampled and the associated risk values, and they are in the table below. The results indicate that this type of an action, as an example, should result in no appreciable risk remaining for avian and mammalian ecological receptors exposed to the dry creek channel.

Dry Creek Channel only risk calculation results, after theoretical remediation halfway down the segment that has been sampled:

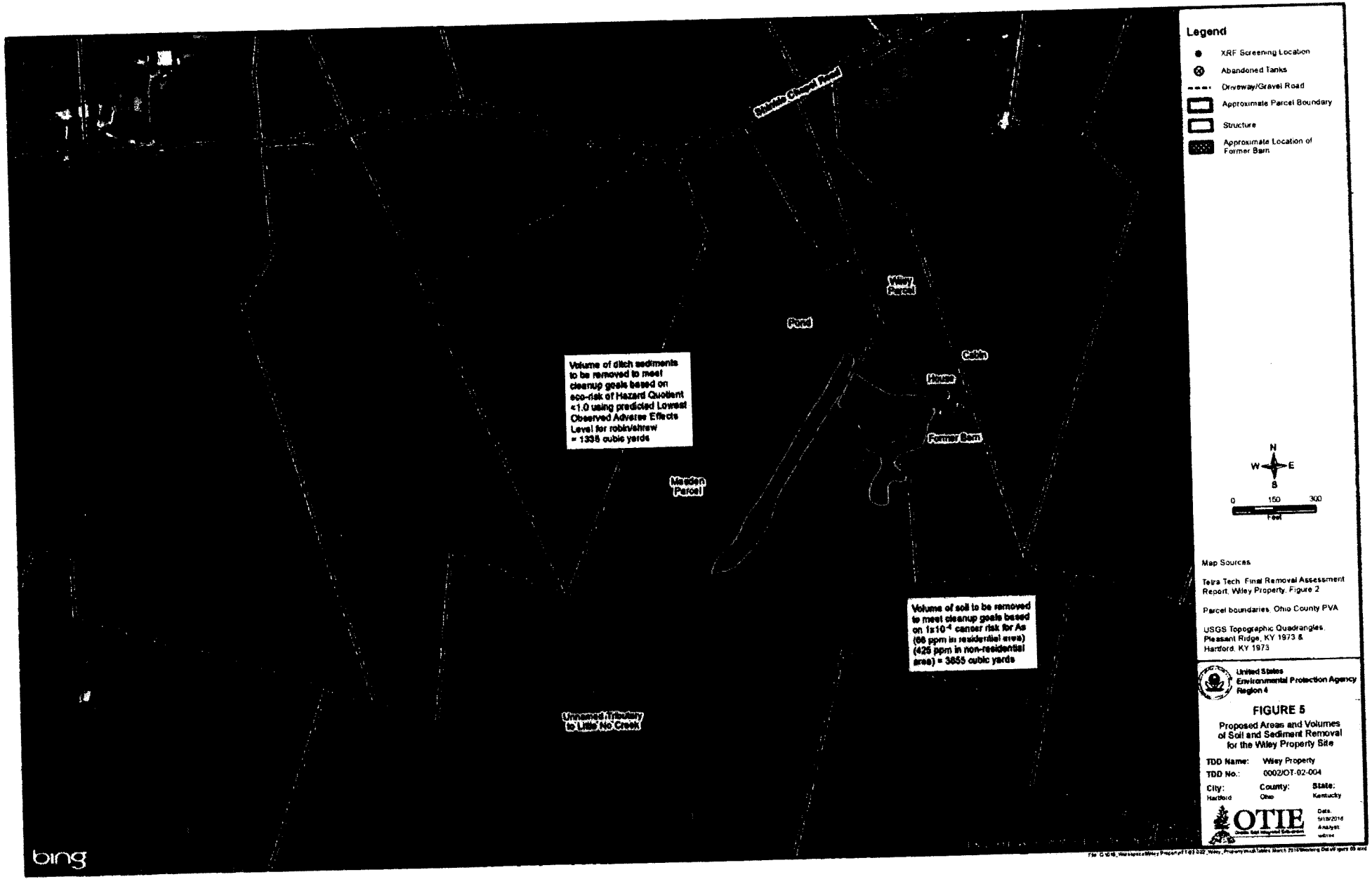
	Arsenic LOAEL-based Hazard Quotients	
	95% UCL As soil conc estimate = 166 mg/kg if upper half of channel remediated	Mean As soil conc estimate = 98 mg/kg if upper half of channel remediated
Robin	1.2	0.8
Shrew	1.5	1.0

Thank you for the opportunity to perform this analysis. Please let me know if you would like to discuss these findings or recommendations. If so, please contact me at (404) 562-8751 or at thomas.brett@epa.gov.

Brett Thomas

ATTACHMENT D

Proposed Locations of Soil and Sediment Removal



Map Sources

Tetra Tech. Final Removal Assessment Report, Wiley Property, Figure 2

Parcel boundaries, Ohio County PVA

USGS Topographic Quadrangles, Pleasant Ridge, KY 1973 & Hartford, KY 1973

United States Environmental Protection Agency Region 4

FIGURE 5

Proposed Areas and Volumes of Soil and Sediment Removal for the Wiley Property Site

TDD Name: Wiley Property

TDD No.: 0002/OT-02-004

City: Hartford **County:** Ohio **State:** Kentucky

OTIE

Date: 5/18/2016
Analyst: wilmie

ATTACHMENT E
Applicable or Relevant and Applicable Requirements (ARARs)

ACTION-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	
FEDERAL				
Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (RCRA Subtitle D)	40 CFR Part 257, Subpart A	Regulates facilities which handle and dispose of solid waste.	Applicable	Applic excava
RCRA Subtitle C	40 CFR Parts 260, 261, and 262 Subpart A	Regulates the determination of whether a solid waste is a hazardous waste.	Applicable	Applic soils ar
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Standards applicable to transporters of hazardous waste	Applicable	Applic charact
Standards Applicable to Management of Hazardous Waste (e.g., excavated soils)	40 CFR Part 264.554	Regulates the storage of remediation waste on-site prior to transportation and disposal	Relevant and Appropriate	Standa of a R(provisi staging approp
Land Disposal Restrictions	40 CFR Part 268	Identifies hazardous wastes that are restricted from land disposal	Applicable	Applic charact
Standards Applicable to Transportation of Hazardous Materials	40 CFR Part 171.2 and 40 CFR Part 172	Regulates the classification, marking, and shipping of hazardous materials	Applicable	Applic charact
STATE				
Environmental Performance Standards	401 KAR 30:031	Establishes standards for the licensing, locating, constructing, and operating solid waste facilities.	Applicable	Applic excava
Control of Fugitive Dust	401 KAR 63:010 § 3(1) and (1)(a), (b), (d), (e) and (f) and 401 KAR 63:010 § 3 (2)	Regulates fugitive emissions from land-disturbing activities	Applicable	Applic contan

ACTION-SPECIFIC ARARs

Standard, Requirement, Criteria, or Limitation	Citation	Description	Applicable or Relevant and Appropriate	
Surface Water Standards	401 KAR 5:031	Establishes standards for the prevention, abatement, and control of water pollution	Relevant and Appropriate	Applic facility howev 0.340 r aquatic relevan

11049743

TETRA TECH

January 7, 2016

Mr. Art Smith
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW, 11th Floor
Atlanta, Georgia 30303

Subject: **Final Removal Assessment Report**
Wiley Property
Hartford, Ohio County, Kentucky
Contract Number (No.) EP-S4-14-03
TDD No. TT-02-002

Dear Mr. Smith:

The Tetra Tech Superfund Technical Assessment and Response Team (START) is submitting this final removal assessment report summarizing arsenic screening and multi-media sampling activities conducted on March 24, 2015; October 15, 2015; and October 20 and 21, 2015 at the Wiley Property Site (the Site) in Hartford, Ohio County, Kentucky. This report includes five enclosures and one attachment. Enclosure 1 contains figures illustrating the site location, site layout, and screening and multi-media sampling locations. Enclosure 2 contains tables and a graph summarizing the screening and multi-media sampling results. Enclosure 3 contains the photographic log of the sampling activities. Enclosure 4 contains the field logbook notes. Enclosure 5 contains the data validation reports for the multi-media sampling results. Attachment 1 contains the laboratory data packages for the multi-media analytical sampling results. Attachment 2 contains additional background information on KDEP's involvement with the Site.

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC) requested Tetra Tech START support in performing a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Removal Site Evaluation (RSE) at the Site. The sampling activities pursuant to the RSE were conducted on March 24, 2015; October 15, 2015; and October 20 and 21, 2015. Both Tetra Tech and Oneida Total Integrated Enterprises (OTIE) START conducted x-ray fluorescence (XRF) screening and collected multi-media samples to delineate extent of the arsenic contamination throughout the Site in accordance with the site-specific quality assurance project plan (QAPP). Analytical results confirmed the presence of arsenic in surface soils and sediments at levels exceeding the EPA Region 4 Removal Management Level (RML) thresholds for protection of human health and the environment.

SITE BACKGROUND

The Site is located at 209 Shinkle Chapel Road in Hartford, Ohio County, Kentucky (see Figures 1 and 2 in Enclosure 1). The Kentucky Department for Environmental Protection (KDEP) received a complaint from a resident about the Site, which precipitated an investigation on September 25, 2014. The investigation found an area approximately 30 feet in diameter covered with white residue (source pile), and another area of obvious dead vegetation located downgradient of the source pile extending approximately 75 feet. Subsequent soil sampling found concentrations of total arsenic levels at an average of 129,502

1955 Evergreen Blvd., Suite 300, Duluth, GA 30096
Tel 678.775.3080 Fax 678.775.3138
www.tetratech.com

parts per million (ppm) collected from the white residue area and at an average of 150,605 ppm collected from the downgradient area of dead vegetation. Multiple samples also failed the Toxicity Characteristic Leaching Procedure (TCLP) for arsenic, which classifies this material as a hazardous waste. KDEP requested EPA assistance with further investigation of the site. KDEP referral documents are located in Attachment 2.

ARSENIC SOIL AND SEDIMENT SCREENING, SAMPLING, AND ANALYTICAL RESULTS

The following sampling activities were conducted in support of the March 2015 and the October 2015 RSE:

- XRF soil and sediment screening at various locations on the Site.
- XRF screening in the house foyer.
- Bulk material sample collection from the identified source pile.
- Surface and subsurface soil sampling at various location on the Site.
- Surface sediment sampling from a dry creek bed located directly downgradient of the Site source pile.

The following sections discuss screening and sampling procedures and results. The complete electronic data files for all XRF screening data are available in the project file and are not included in this report.

XRF Screening and Bulk Material Sampling

On March 24, 2015, EPA and Tetra Tech START conducted an initial evaluation involving XRF soil screening and bulk material sampling at the Site. Tetra Tech START conducted XRF screening of the surface soil located in the driveway extending from the Shinkle Chapel Road entrance to the house and small cabin and in an area where an orchard may have previously been located (see Figure 3 in Enclosure 1). The survey was conducted using a Thermo Scientific Niton XL3t XRF Analyzer (Niton). XRF screening was conducted approximately every 10 feet along the length of the driveway and at various locations throughout the previous orchard area. XRF screening results indicated arsenic levels were less than 50 ppm throughout both areas (see Table 1 in Enclosure 2). Tetra Tech START also screened one point of the tile floor approximately four feet inside the foyer entrance of the house. The screening result at this location indicated the arsenic level was 774 ppm.

After XRF screening was completed, Tetra Tech START collected a bulk material sample from the identified source pile located southwest of the house (see Figure 3 and 6 in Enclosure 1). The grab sample was collected from one to three inches below the surface of the center of the pile. The sample was processed and shipped to ALS Laboratory in Kelso, Washington, and Brooks Rand Labs in Seattle, Washington for Target Analyte List (TAL) metals and chloride and arsenic speciation analysis, respectively.

Sample WP-032415-W was analyzed using the following analytical methods:

- EPA Method 6010C, Inductively Coupled Plasma - Atomic Emission Spectrometry, was used for TAL metals: aluminum, arsenic, calcium, iron, magnesium, potassium, and sodium.
- EPA Method 6020A, Inductively Coupled Plasma - Mass Spectrometry, was used for TAL metals: antimony, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, thallium, vanadium, and zinc.

- EPA Method 7471B, Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique), was used for TAL metal: mercury.
- EPA Method 300.0, Inorganic Anions by Ion Chromatography, was used for chloride.
- Ion Chromatography Inductively Coupled Plasma Dynamic Reaction Cell Mass Spectrometry (IC-ICP-DRC-MS) was used for speciation.

Sample WP-032415-W analytical results for TAL metals and chloride indicated the total arsenic level was 747,000 milligrams per kilogram (mg/kg), which exceeds the EPA Region 4 RML for arsenic of 68 mg/kg for residential soil. Arsenic speciation of sample WP-032415-W indicated that arsenic (III) was the compound of concern. See Table 2 in Enclosure 2 for a summary of analytical results.

XRF screening values are reported as a concentration, parts per million, as a result of using a direct reading instrument such as the Niton. The analytical results for the samples are reported as weight units, mg/kg. These units compare the weight of the impurity to the total weight of the sample. A milligram is a millionth of a kilogram and is commonly referred to as a part per million in order to compare the units.

XRF Screening and Soil Sampling

On October 15, 2015, OTIE START conducted XRF screening of the subsurface soil to determine the extent and depth of the arsenic contamination near the source pile (see Figure 4 in Enclosure 1). OTIE START collected subsurface soil samples to compare to the XRF screening results. Two test pits were excavated by the Emergency and Rapid Response Services (ERRS) contractor, CMC, Inc. (CMC). OTIE START conducted XRF screening of the test pits with the Niton. Subsurface soil screening results ranged from less than the limit of detection (LOD) to 34,991.68 ppm (see Table 1 in Enclosure 2). A grab soil sample was collected from each test pit at approximately 12 inches below ground surface (bgs) for comparison to XRF screening results (see Figure 4 in Enclosure 1). The samples were analyzed by ALS Environmental, located in Cincinnati, Ohio, for total arsenic using EPA Method 6010C. Analytical results for total arsenic in samples WP-101515-SB-01 and WP-101515-SB-02 were 14,000 mg/kg and 5,200 mg/kg, respectively (see Table 3 in Enclosure 2). Analytical results for both samples exceeded the EPA Region 4 RML for residential soil. Comparison of XRF screening and analytical results are provided in Table 4 and Graph 1 in Enclosure 2).

On October 20 to 21, 2015, Tetra Tech and OTIE START conducted XRF screening of the surface soil to determine the extent of the arsenic contamination around the drip line of the house and downgradient from the source pile in intervals of every 10 feet using the Niton (see Figure 4 in Enclosure 1). Surface soil screening results ranged from less than the LOD to 255,366.42 ppm (see Table 1 in Enclosure 2). Tetra Tech and OTIE START collected soil samples from randomly selected screening locations downgradient of the source pile to compare to XRF screening results. One seven point composite sample was collected from the drip line of the house and eighteen grab soil samples were collected around and downgradient from the source pile at a depth of one to three inches bgs (see Figures 4 and 6 in Enclosure 1). A duplicate sample and a matrix spike and matrix spike duplicate sample were also collected for quality control purposes. The samples were analyzed by ALS Environmental, located in Cincinnati, Ohio, for total arsenic using EPA Method 6010C. Analytical results for total arsenic are as follows (see Table 3 in Enclosure 2):

- Sample WP-102115-SF-01, collected from the drip line of the house, reported a total arsenic level of 76 mg/kg.

- Samples WP-102115-SF-02 to WP-102115-SF-19, collected downgradient of the source pile, reported total arsenic levels ranging from 63 mg/kg to 31,000 mg/kg.
- Analytical results for 17 of the 19 samples were the same as or exceeded the EPA Region 4 RML for arsenic in residential soil.

Comparison of XRF screening and analytical results are located in Table 4 and Graph 1 in Enclosure 2:

XRF Screening and Sediment Sampling

On October 20 to 21, 2015, Tetra Tech and OTIE START conducted XRF screening of the surface sediment to determine the extent of the arsenic contamination in the dry creek bed and surface drainage features downgradient from the source pile in intervals of every 100 feet along an approximate 2,400 foot distance using the Niton (see Figure 5 in Enclosure 1). Surface sediment screening results ranged from less than the LOD to 3,430.73 ppm (see Table 5 in Enclosure 2). Five grab sediment samples were collected, at approximately equidistant locations, from the dry creek bed at a depth of one to three inches bgs (see Figures 5 and 6 in Enclosure 1). A duplicate sample and a matrix spike and matrix spike duplicate sample were also collected for quality control purposes. The samples were analyzed by ALS Environmental, located in Cincinnati, Ohio, for total arsenic using EPA Method 6010C.

- Analytical results reported total arsenic levels for samples WP-102115-SD-01 to WP-102115-SD-05 ranging from 130 mg/kg to 4,700 mg/kg (see Table 6 in Enclosure 2).

ARSENIC VACUUM SAMPLING AND ANALYTICAL RESULTS

On October 20, 2015, Tetra Tech START conducted vacuum sampling for arsenic dust inside of the Site house and the cabin (see Figures 7A through 7C in Enclosure 1). Vacuum dust sampling was conducted on the floors of the house and cabin approximately two to four inches from the wall. Sampling locations were based on a visual inspection of the surfaces inside the home and the cabin. Samples were collected from within a 10 centimeter (cm) by 10 cm area using 0.8 micrometer (µm) match weight mixed cellulose ester (MCE) filters. The filters were attached to a Gilian GilAir Tri-Mode Air Sampler (Gilian) low volume air sampling pump calibrated to 3.03 liters per minute (lpm). Each sample was collected in accordance with American Society for Testing and Materials (ASTM) D7144 – 05a(2011), Standard Practice for Collection of Surface Dust by Micro-vacuum Sampling for Subsequent Metal Determination.

A total of 10 vacuum dust samples were collected along with a field blank for quality control purposes. Eight samples were collected from the floor of the house and two samples were collected from the floor of the cabin at the Site. The samples were analyzed by ALS Environmental, located in Cincinnati, Ohio, for total arsenic using EPA Method 6010B, Inductively Coupled Plasma - Atomic Emission Spectrometry.

- Analytical results for total arsenic in the house and the cabin were below the reportable detection limit (see Table 7 in Enclosure 2).

ARSENIC AREA AIR SAMPLING AND ANALYTICAL RESULTS

On October 21, 2015, Tetra Tech START conducted area air sampling inside of the Site house and cabin. Prior to conducting air sampling, Tetra Tech personnel stirred up the dust in the house and cabin using a 20 inch box fan connected to a portable generator. Sampling locations were based on a visual inspection of the home and the cabin (see Figures 7A to 7C in Enclosure 1). The area air samples were collected in

the center of each sampling area at a height of four to five feet representing the breathing zone. A 20 inch box fan was placed in each sampling area to create air circulation and stir up dust during sampling. Samples were collected using 0.8 µm match weight MCE filters. The filters were attached to Gilian low volume air sampling pumps calibrated to an average flow rate of approximately 3.0 lpm. Each sample was collected in accordance with National Institute of Occupational Safety and Health (NIOSH) Method 7300.

A total of five area air samples were collected inside the house and one area air sample was collected in the cabin, along with a field blank for quality control purposes. The samples were analyzed by ALS Environmental, located in Cincinnati, Ohio, for total arsenic using NIOSH Method 7300.

- Analytical results for total arsenic at each location were below the reportable detection limit (see Table 8 in Enclosure 2).

PERSONAL AIR SAMPLING AND ANALYTICAL RESULTS

On March 24, 2015, Tetra Tech START conducted personal air sampling for arsenic dust while conducting XRF screening and waste sampling activities at the Site. The personal air samples were collected in the breathing zone which can be visualized as a hemisphere approximately 6 to 9 inches around an individual's face. Personal air sampling was conducted using 0.8 µm match weight MCE filters. The filters were attached to a Gilian low volume air sampling pump calibrated to an average flow rate of approximately 2.0 lpm. Each sample was collected in accordance with the NIOSH Method 7300, Elements by Inductively Coupled Plasma (ICP).

A total of two personal air samples (WP-032415-AA-01 and WP-032415-AA-02) were collected along with a field blank (WWP-032515-AA-FB) for quality control purposes. The samples were analyzed by ALS Environmental, located in Kelso, Washington, for total arsenic using NIOSH Method 7300.

- Analytical results for total arsenic at each location were below the reportable detection limit (see Table 8 in Enclosure 2).

On October, 2015, Tetra Tech START conducted personal air sampling for arsenic dust while conducting XRF screening and multi-media sampling activities at the Site. The personal air samples were collected in the breathing zone as previously described using 0.8 µm match weight MCE filters attached to Gilian low volume air sampling pumps calibrated to an average flow rate of approximately 3.0 lpm. Each sample was collected in accordance with NIOSH Method 7300.

A total of two personal air samples (WP-102115-PA-01 and WP-102115-PA-02) were collected. The samples were analyzed by ALS Environmental, located in Cincinnati, Ohio, for total arsenic using NIOSH Method 7300.

- Analytical results for total arsenic at each location were below the reportable detection limit (see Table 8 in Enclosure 2).

If you have any questions or need additional copies of this report, please contact Paul Prys at (678) 775-3106 or Sherry Weedman at (502) 569-9067.

Sincerely,

Paul E. Prys II
START IV Senior Scientist

Andrew F. Johnson
START IV Program Manager

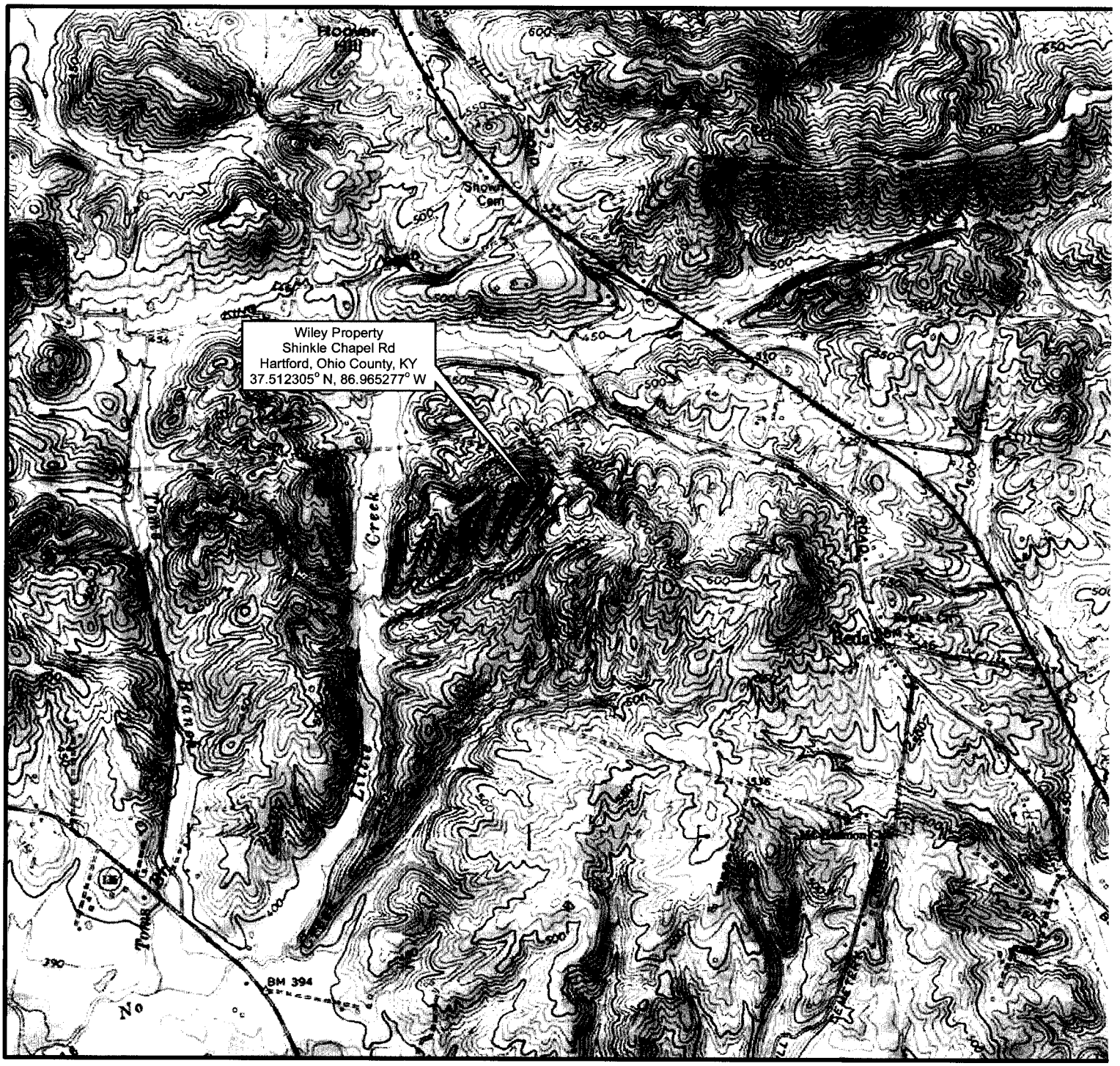
Enclosures (5)
Attachments (2)

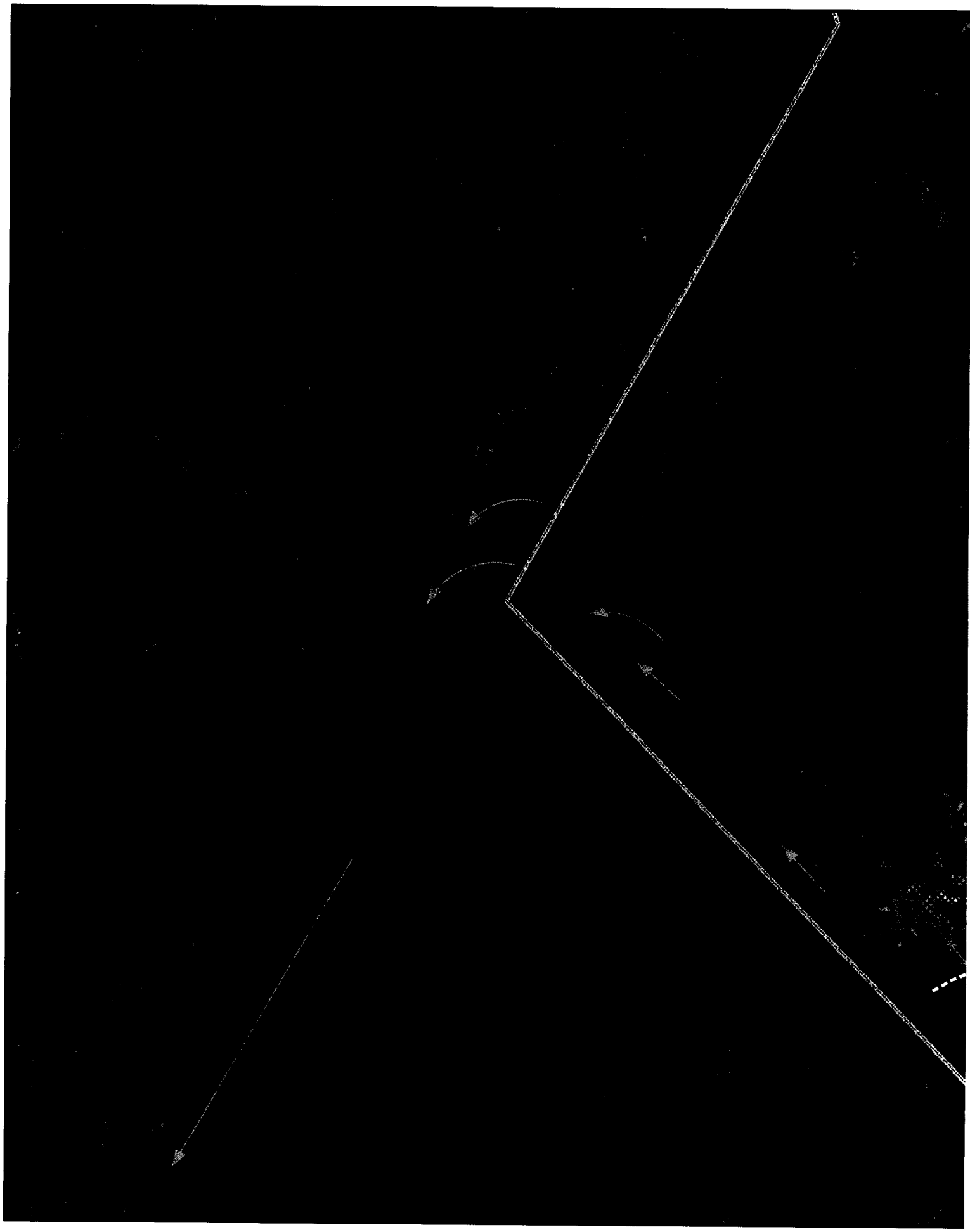
cc: Katrina Jones, EPA Project Officer
Angel Reed, START IV Document Control Coordinator

ENCLOSURE 1

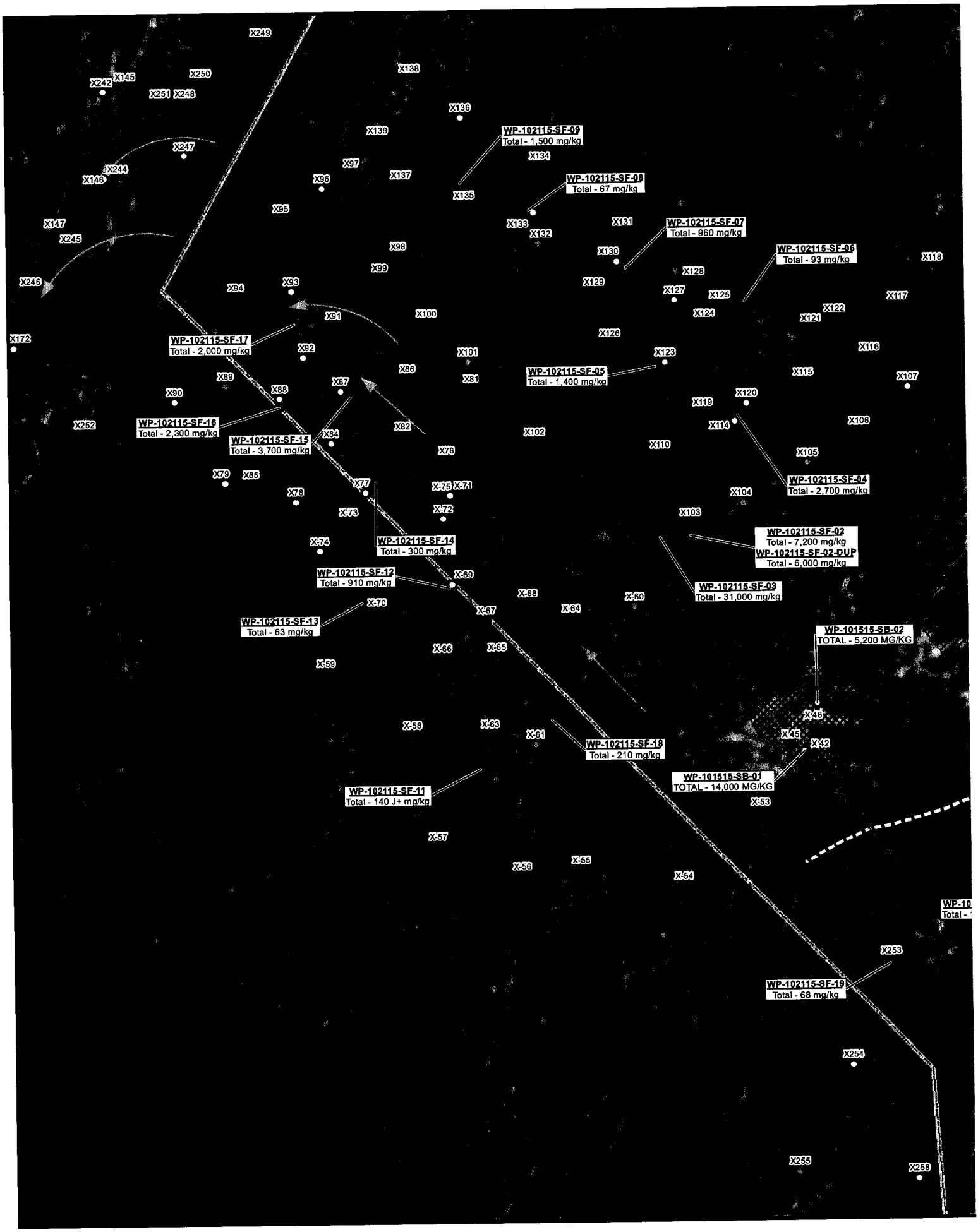
FIGURES

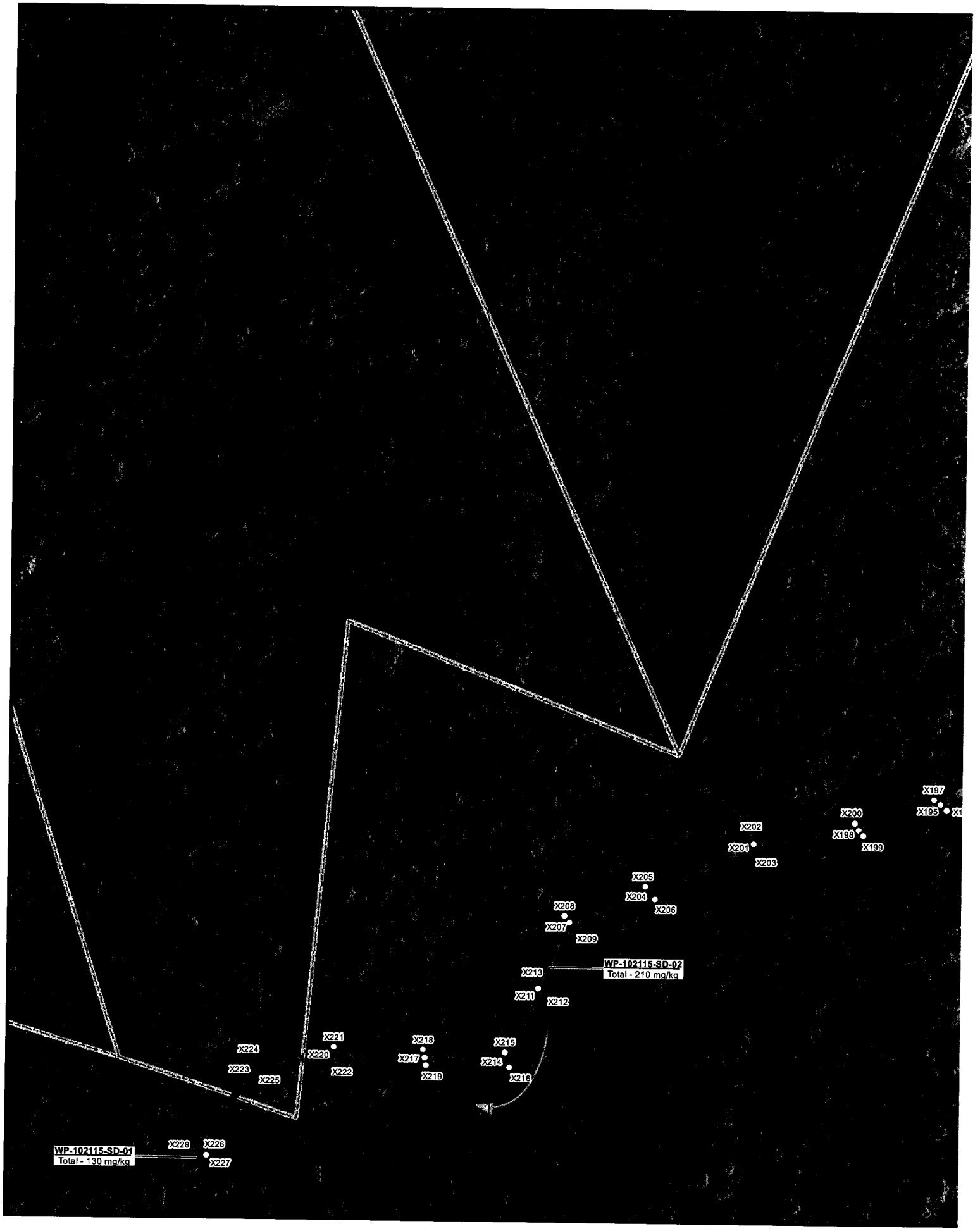
(9 Pages)

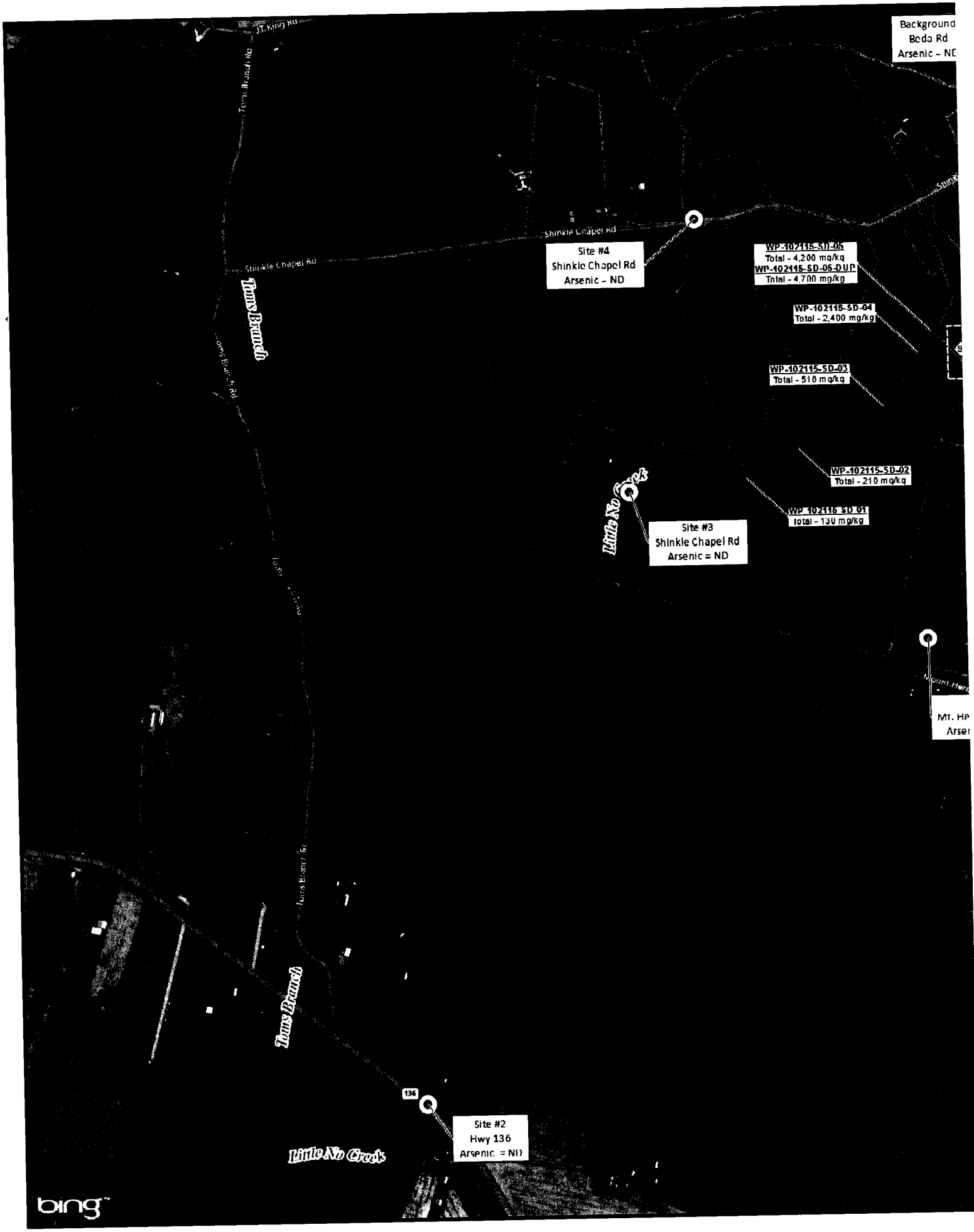

Wiley Property
Shinkle Chapel Rd
Hartford, Ohio County, KY
37.512305° N, 86.965277° W
Hoover Hill
Shown Cem
Creek
Little
Branch
BM 394
No



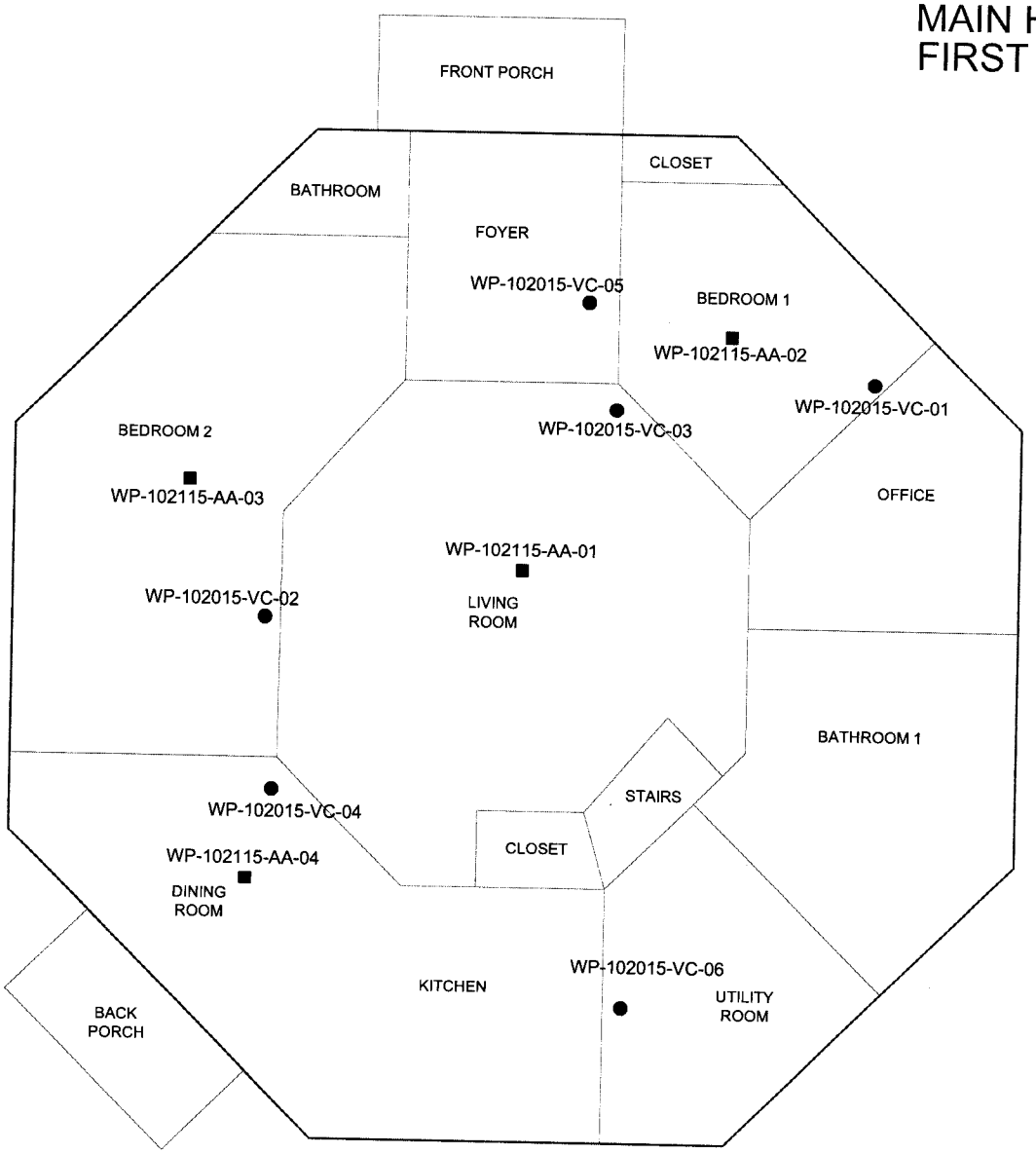
Shinkle Chapel Rd
Farm/Pasture
G
X11
X13
X16
X17
X18
X19
X20
X21
X22
X23
X24
X25
X26
X27
X28
X29
X30
X31
W
X48
X51
X54
Wooded Area
Wooded Area
Wooded Area
Wooded Area
Wooded Area


X249
X250
X242
X145
X251
X248
X138
X136
X139
WP-102115-SF-09
Total - 1,500 mg/kg
X134
X247
X97
X244
X146
X96
X137
WP-102115-SF-08
Total - 67 mg/kg
X135
X95
X147
X133
X131
X245
X132
WP-102115-SF-07
Total - 960 mg/kg
X98
X130
WP-102115-SF-06
Total - 93 mg/kg
X118
X99
X128
X249
X94
X93
X129
X127
X125
X117
X122
X91
X100
X124
X121
X172
WP-102115-SF-17
Total - 2,000 mg/kg
X126
X116
X92
X101
X123
X86
WP-102115-SF-05
Total - 1,400 mg/kg
X115
X107
X89
X87
X61
X90
X88
X120
X119
X252
WP-102115-SF-16
Total - 2,300 mg/kg
X82
X114
X106
X84
X102
WP-102115-SF-15
Total - 3,700 mg/kg
X110
X76
X105
X79
X85
X77
X75
X71
WP-102115-SF-04
Total - 2,700 mg/kg
X78
X104
X73
X72
X103
WP-102115-SF-02
Total - 7,200 mg/kg
WP-102115-SF-02-DUP
Total - 6,000 mg/kg
X74
WP-102115-SF-14
Total - 300 mg/kg
WP-102115-SF-12
Total - 910 mg/kg
X69
WP-102115-SF-03
Total - 31,000 mg/kg
X68
X60
X70
X67
X64
WP-102115-SF-13
Total - 63 mg/kg
WP-101515-SB-02
TOTAL - 5,200 MG/KG
X66
X65
X59
X46
X58
X63
X61
X45
WP-102115-SF-18
Total - 210 mg/kg
X42
WP-101515-SB-01
TOTAL - 14,000 MG/KG
WP-102115-SF-11
Total - 140 J+ mg/kg
X53
X57
X55
X56
X54
WP-10
Total -
X253
WP-102115-SF-19
Total - 68 mg/kg
X254
X255
X258


X197
X195
X200
X198
X199
X202
X201
X203
X205
X204
X206
X208
X207
X209
WP-102115-SD-02
Total - 210 mg/kg
X213
X211
X212
X221
X220
X222
X224
X223
X225
X218
X217
X219
X215
X214
X216
WP-102115-SD-01
Total - 130 mg/kg
X228
X226
X227


Background
Beda Rd
Arsenic – ND
Shinkle Chapel Rd
Site #4
Shinkle Chapel Rd
Arsenic – ND
WP-102115-SD-05
Total - 4,200 mg/kg
WP-102115-SD-05-DUP
Total - 4,700 mg/kg
WP-102115-SD-04
Total - 2,400 mg/kg
WP-102115-SD-03
Total - 510 mg/kg
WP-102115-SD-02
Total - 210 mg/kg
WP-102115-SD-01
Total - 130 mg/kg
Site #3
Shinkle Chapel Rd
Arsenic = ND
Tims Branch
Little No Creek
Site #2
Hwy 136
Arsenic = ND
136
bing

MAIN HOUSE
FIRST FLOOR



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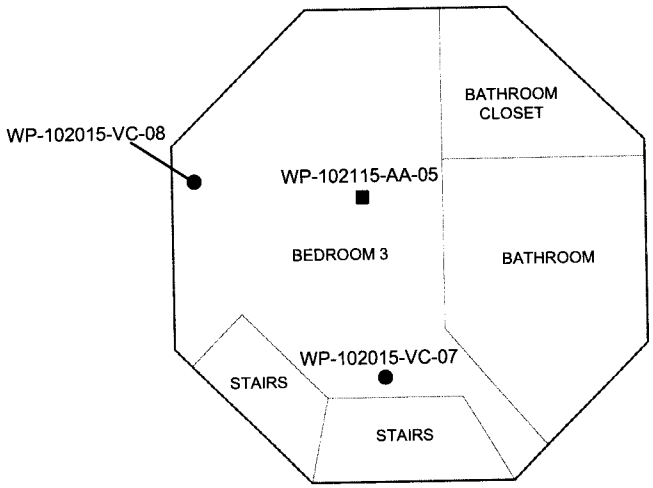
MAIN HOUSE
SECOND FLOOR



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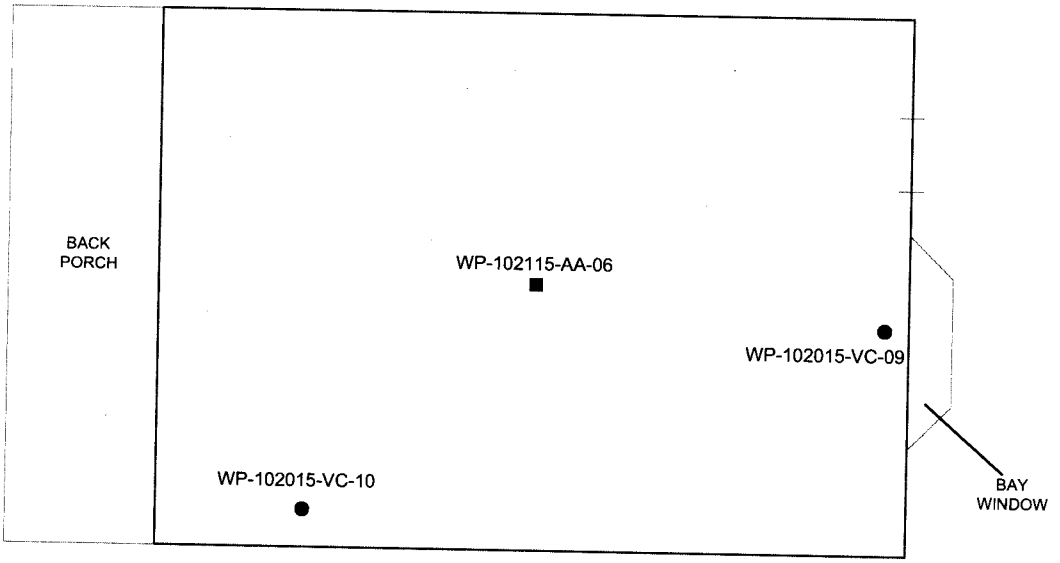
CABIN



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ENCLOSURE 2

MULTI-MEDIA SAMPLING RESULTS TABLES AND GRAPH

(15 Pages)

TABLE 1
WILEY PROPERTY
XRF SCREENING RESULTS FOR SURFACE AND SUBSURFACE SOIL SAMPLES

Reading No.	Date/Time	Type	Units	As	As Error
10	3/24/2015 10:15	System Check	cps		
11	3/24/2015 10:23	Soil	ppm	< LOD	17.7
12	3/24/2015 10:55	Soil	ppm	< LOD	12.86
13	3/24/2015 10:57	Soil	ppm	< LOD	10.08
14	3/24/2015 10:57	Soil	ppm	< LOD	5.08
15	3/24/2015 10:57	Soil	ppm	< LOD	2.94
16	3/24/2015 10:58	Soil	ppm	< LOD	12.94
17	3/24/2015 11:00	Soil	ppm	< LOD	6.88
18	3/24/2015 11:01	Soil	ppm	28.91	18.03
19	3/24/2015 11:02	Soil	ppm	< LOD	11.21
20	3/24/2015 11:04	Soil	ppm	< LOD	12.49
21	3/24/2015 11:05	Soil	ppm	< LOD	14.85
22	3/24/2015 11:06	Soil	ppm	< LOD	17.44
23	3/24/2015 11:08	Soil	ppm	< LOD	23.94
24	3/24/2015 11:10	Soil	ppm	16.56	8.79
25	3/24/2015 11:11	Soil	ppm	< LOD	16.03
26	3/24/2015 11:13	Soil	ppm	< LOD	13.29
27	3/24/2015 11:14	Soil	ppm	< LOD	15.78
28	3/24/2015 11:15	Soil	ppm	< LOD	19.84
29	3/24/2015 11:16	Soil	ppm	< LOD	17.67
30	3/24/2015 11:18	Soil	ppm	21.13	8.4
31	3/24/2015 11:20	Soil	ppm	< LOD	16.34
32	3/24/2015 11:21	Soil	ppm	< LOD	13.67
33	3/24/2015 11:22	Soil	ppm	< LOD	18.42
34	3/24/2015 11:24	Soil	ppm	44.67	12.84
35	3/24/2015 11:26	Soil	ppm	22.67	8.92
36	3/24/2015 11:28	Soil	ppm	< LOD	14.15
37	3/24/2015 11:29	Soil	ppm	< LOD	17.95
38	3/24/2015 11:32	Soil	ppm	< LOD	16.4
39	3/24/2015 11:33	Soil	ppm	< LOD	95.46
40	3/24/2015 11:34	Soil	ppm	< LOD	10.95
41	3/24/2015 11:37	Soil	ppm	23.25	6.68
42	3/24/2015 11:41	Soil	ppm	< LOD	15.87
43	3/24/2015 11:42	Soil	ppm	< LOD	17.98
44	3/24/2015 11:44	Soil	ppm	16.03	6.51
45	3/24/2015 11:46	Soil	ppm	8.9	5.56
46	3/24/2015 11:48	Soil	ppm	10.07	5.31
47	3/24/2015 11:50	Soil	ppm	773.79	291.23
48	3/24/2015 12:00	Soil	ppm	11.02	6.95
49	3/24/2015 12:03	Soil	ppm	< LOD	8.02
50	3/24/2015 12:03	Soil	ppm	< LOD	1.02
51	3/24/2015 12:04	Soil	ppm	< LOD	11.92
52	3/24/2015 12:08	Soil	ppm	0.92	0.41
53	3/24/2015 12:08	Soil	ppm	< LOD	2.87
54	3/24/2015 12:08	Soil	ppm	< LOD	14.65
55	3/24/2015 12:26	Soil	ppm	359.58	23.84
56	3/24/2015 12:28	Soil	ppm	1251.56	52.54

TABLE 1
WILEY PROPERTY
XRF SCREENING RESULTS FOR SURFACE AND SUBSURFACE SOIL SAMPLES

Reading No.	Date/Time	Type	Units	As	As Error
57	3/24/2015 12:30	Soil	ppm	704.47	47.76
58	3/24/2015 12:31	Soil	ppm	638.84	42.6
59	3/24/2015 12:34	Soil	ppm	38565.55	308.52
60	3/24/2015 12:36	Soil	ppm	4193.13	74.03
61	3/24/2015 12:38	Soil	ppm	< LOD	1169.59
62	3/24/2015 12:39	Soil	ppm	824.21	33.99
63	3/24/2015 12:41	Soil	ppm	505.64	24.13
64	3/24/2015 12:43	Soil	ppm	278.03	23.05
38	10/15/2015 13:51	Soil	ppm	<LOD	142.87
39	10/15/2015 13:57	Soil	ppm	365.82	33.95
40	10/15/2015 14:01	Soil	ppm	<LOD	5.53
41	10/15/2015 16:13	Soil	ppm	18429.23	10668.35
42	10/15/2015 16:15	Soil	ppm	34991.68	349.18
43	10/15/2015 16:15	Soil	ppm	<LOD	295.99
44	10/15/2015 16:20	Soil	ppm	<LOD	0.4
45	10/15/2015 16:22	Soil	ppm	10139.88	138.07
46	10/15/2015 16:27	Soil	ppm	5743.02	84.96
47	10/15/2015 16:53	Soil	ppm	<LOD	11.69
48	10/16/2015 11:11	Soil	ppm	201.78	30.58
49	10/20/2015 10:11	System Check	cps		
50	10/20/2015 10:36	Soil	ppm	<LOD	4.75
51	10/20/2015 10:38	Soil	ppm	363.49	34.28
52	10/20/2015 10:40	Soil	ppm	103.18	13.76
53	10/20/2015 11:12	Soil	ppm	255366.42	1360.6
54	10/20/2015 11:18	Soil	ppm	2317.84	50.23
55	10/20/2015 11:23	Soil	ppm	86.58	10.42
56	10/20/2015 11:25	Soil	ppm	46.98	7.68
57	10/20/2015 11:28	Soil	ppm	42.66	8.49
58	10/20/2015 11:31	Soil	ppm	53.02	9.44
59	10/20/2015 11:34	Soil	ppm	31.75	8.29
60	10/20/2015 11:38	Soil	ppm	770.75	22.11
61	10/20/2015 11:41	Soil	ppm	512.55	23.97
62	10/20/2015 11:41	Soil	ppm	<LOD	60.46
63	10/20/2015 11:43	Soil	ppm	81.27	9.24
64	10/20/2015 11:47	Soil	ppm	4256.67	58.3
65	10/20/2015 11:50	Soil	ppm	87.45	10.72
66	10/20/2015 11:52	Soil	ppm	43.92	7.84
67	10/20/2015 11:54	Soil	ppm	36.89	8.63
68	10/20/2015 11:57	Soil	ppm	3552.7	58.52
69	10/20/2015 11:59	Soil	ppm	187.74	14.47
70	10/20/2015 12:01	Soil	ppm	32.96	7.75
71	10/20/2015 12:04	Soil	ppm	498.65	17.5
72	10/20/2015 12:06	Soil	ppm	310.33	17.25
73	10/20/2015 12:08	Soil	ppm	65.99	8.22
74	10/20/2015 12:11	Soil	ppm	<LOD	8.46
75	10/20/2015 12:14	Soil	ppm	3318.18	53.9
76	10/20/2015 13:32	Soil	ppm	6402.85	77.32

TABLE 1
WILEY PROPERTY
XRF SCREENING RESULTS FOR SURFACE AND SUBSURFACE SOIL SAMPLES

Reading No.	Date/Time	Type	Units	As	As Error
77	10/20/2015 13:35	Soil	ppm	104.47	10.36
78	10/20/2015 13:37	Soil	ppm	101.29	12.29
79	10/20/2015 13:39	Soil	ppm	<LOD	7.67
80	10/20/2015 13:41	Soil	ppm	<LOD	2817.84
81	10/20/2015 13:42	Soil	ppm	6591.83	82.4
82	10/20/2015 13:44	Soil	ppm	6627.42	84.71
83	10/20/2015 13:45	Soil	ppm	<LOD	0.63
84	10/20/2015 13:46	Soil	ppm	326.73	20.8
85	10/20/2015 13:52	Soil	ppm	25.57	7.34
86	10/20/2015 13:55	Soil	ppm	2036.7	38.45
87	10/20/2015 13:57	Soil	ppm	155.53	10.41
88	10/20/2015 13:59	Soil	ppm	162.87	13.85
89	10/20/2015 14:01	Soil	ppm	569.55	20.82
90	10/20/2015 14:03	Soil	ppm	<LOD	9.93
91	10/20/2015 14:06	Soil	ppm	1450.06	42.23
92	10/20/2015 14:07	Soil	ppm	448.88	20.36
93	10/20/2015 14:09	Soil	ppm	411.55	18.6
94	10/20/2015 14:11	Soil	ppm	7153.36	85.49
95	10/20/2015 14:16	Soil	ppm	23.53	7.69
96	10/20/2015 14:18	Soil	ppm	216.74	14.94
97	10/20/2015 14:19	Soil	ppm	5528.04	70.25
98	10/20/2015 14:22	Soil	ppm	6135.33	77.07
99	10/20/2015 14:24	Soil	ppm	1303.22	29.64
100	10/20/2015 14:25	Soil	ppm	19431.46	157.8
101	10/20/2015 14:27	Soil	ppm	801.94	27.69
102	10/20/2015 14:29	Soil	ppm	2313.58	42.85
103	10/20/2015 14:33	Soil	ppm	1144.25	31.57
104	10/20/2015 14:35	Soil	ppm	611.07	22.86
105	10/20/2015 14:36	Soil	ppm	861.72	28.87
106	10/20/2015 14:38	Soil	ppm	81.31	10.18
107	10/20/2015 14:40	Soil	ppm	109.6	13.81
108	10/20/2015 14:41	Soil	ppm	117.01	12.61
109	10/20/2015 14:43	Soil	ppm	77.1	10.81
110	10/20/2015 14:47	Soil	ppm	11140.9	117.14
111	10/20/2015 16:34	System Check	cps		
112	10/20/2015 16:39	System Check	cps		
113	10/20/2015 16:44	Soil	ppm	815.02	53.72
114	10/20/2015 17:08	Soil	ppm	381.79	18.48
115	10/20/2015 17:10	Soil	ppm	77.48	10.57
116	10/20/2015 17:12	Soil	ppm	67.15	12.86
117	10/20/2015 17:14	Soil	ppm	91.48	11.78
118	10/20/2015 17:16	Soil	ppm	60.35	9.61
119	10/20/2015 17:18	Soil	ppm	1018	32.31
120	10/20/2015 17:20	Soil	ppm	245.24	19.03
121	10/20/2015 17:21	Soil	ppm	89.31	11.52
122	10/20/2015 17:23	Soil	ppm	35.69	8.53
123	10/20/2015 17:25	Soil	ppm	258.22	15.24

TABLE 1
WILEY PROPERTY
XRF SCREENING RESULTS FOR SURFACE AND SUBSURFACE SOIL SAMPLES

Reading No.	Date/Time	Type	Units	As	As Error
124	10/20/2015 17:27	Soil	ppm	83.62	9.63
125	10/20/2015 17:28	Soil	ppm	66.65	13.18
126	10/20/2015 17:31	Soil	ppm	9956.16	109.54
127	10/20/2015 17:32	Soil	ppm	188.56	13.46
128	10/20/2015 17:34	Soil	ppm	55.75	10.67
129	10/20/2015 17:36	Soil	ppm	1217.65	32.49
130	10/20/2015 17:37	Soil	ppm	328.26	17.85
131	10/20/2015 17:38	Soil	ppm	14.41	6.07
132	10/20/2015 17:40	Soil	ppm	845.13	28.34
133	10/20/2015 17:42	Soil	ppm	444.03	25.13
134	10/20/2015 17:43	Soil	ppm	18.9	6.85
135	10/20/2015 17:45	Soil	ppm	1536.5	42.74
136	10/20/2015 17:46	Soil	ppm	<LOD	11.19
137	10/20/2015 17:48	Soil	ppm	1973.8	37.57
138	10/20/2015 17:50	Soil	ppm	15.35	7.35
139	10/20/2015 17:51	Soil	ppm	3367.55	57.92
144	10/20/2015 18:05	Soil	ppm	<LOD	15.94
161	10/20/2015 18:37	Soil	ppm	<LOD	3.87
164	10/21/2015 9:17	System Check	cps		
165	10/21/2015 9:19	Soil	ppm	<LOD	4.91
166	10/21/2015 9:20	Soil	ppm	<LOD	5.68
167	10/21/2015 9:22	Soil	ppm	339.34	34.26
168	10/21/2015 9:24	Soil	ppm	89.4	13.97
169	10/21/2015 9:28	System Check	cps		
179	10/21/2015 10:37	Soil	ppm	96.19	9.45
180	10/21/2015 10:38	Soil	ppm	<LOD	8
190	10/21/2015 11:11	Soil	ppm	<LOD	9.19
191	10/21/2015 11:13	Soil	ppm	<LOD	9.45
210	10/21/2015 11:57	Soil	ppm	<LOD	0.55
229	10/21/2015 14:45	Soil	ppm	26.46	9.52
230	10/21/2015 14:47	Soil	ppm	<LOD	5.7
231	10/21/2015 14:49	Soil	ppm	13.41	8.16
232	10/21/2015 14:51	Soil	ppm	<LOD	10.11
233	10/21/2015 14:53	Soil	ppm	88.12	9.9
234	10/21/2015 14:55	Soil	ppm	15.42	6.45
235	10/21/2015 14:57	Soil	ppm	28.25	8.44
236	10/21/2015 14:58	Soil	ppm	18.13	7.82
237	10/21/2015 15:01	Soil	ppm	14.02	7.02
238	10/21/2015 15:10	Soil	ppm	<LOD	1.39
239	10/21/2015 15:11	Soil	ppm	<LOD	11.76
240	10/21/2015 15:12	Soil	ppm	22.25	8.06
241	10/21/2015 15:14	Soil	ppm	17.09	7.26
243	10/21/2015 16:10	Soil	ppm	<LOD	3.41
252	10/21/2015 16:36	Soil	ppm	24.14	6.78
253	10/21/2015 16:46	Soil	ppm	71.27	10.27
254	10/21/2015 16:48	Soil	ppm	432.19	19.09
255	10/21/2015 16:51	Soil	ppm	654.13	29.81

TABLE 1
WILEY PROPERTY
XRF SCREENING RESULTS FOR SURFACE AND SUBSURFACE SOIL SAMPLES

Reading No.	Date/Time	Type	Units	As	As Error
256	10/21/2015 16:55	Soil	ppm	1314.67	35.16
257	10/21/2015 17:04	Soil	ppm	60.38	11.21
258	10/21/2015 17:08	Soil	ppm	172.85	14.91
259	10/21/2015 17:14	Soil	ppm	1067.04	38.2
260	10/21/2015 17:17	Soil	ppm	456.52	23.02
261	10/21/2015 17:20	Soil	ppm	<LOD	8.57
262	10/21/2015 17:21	Soil	ppm	<LOD	20.01
263	10/21/2015 18:10	Soil	ppm	1155.13	33.81
264	10/21/2015 18:16	Soil	ppm	27447.38	216.84
265	10/21/2015 18:18	Soil	ppm	<LOD	5117.9
266	10/21/2015 18:19	Soil	ppm	412.43	17.43
267	10/21/2015 18:22	Soil	ppm	408.73	18.8
268	10/21/2015 18:26	Soil	ppm	67.11	10.56
269	10/21/2015 18:29	Soil	ppm	314.53	19.94
270	10/21/2015 18:32	Soil	ppm	69.43	9.47
271	10/21/2015 18:34	Soil	ppm	5992.11	78.52
272	10/21/2015 18:41	Soil	ppm	1288.38	40.77
273	10/21/2015 18:52	Soil	ppm	60.01	9
274	10/21/2015 18:56	Soil	ppm	346.1	17.96
275	10/21/2015 19:00	Soil	ppm	36.13	7.86
276	10/21/2015 19:02	Soil	ppm	114.22	11.43
277	10/21/2015 19:06	Soil	ppm	492.93	18.13
278	10/21/2015 19:08	Soil	ppm	382.37	15.47
279	10/21/2015 19:10	Soil	ppm	<LOD	6.14
280	10/21/2015 19:10	Soil	ppm	273	14.22
281	10/21/2015 19:20	Soil	ppm	106.63	12.44
282	10/21/2015 19:23	Soil	ppm	47.24	8.37

Notes:

As	Arsenic
<LOD	Less than the level of detection
No.	Number
ppm	Parts per million
XRF	X-ray fluorescence

Because of misfires or connectivity issues, not all of the XRF screenings listed in t above table are depicted on Figure 3.

TABLE 2
WILEY PROPERTY
ANALYTICAL RESULTS FOR WASTE SAMPLE

Analyte	EPA RML	WP-032415-W
Metals (mg/kg)		
Aluminum	230,000	792 J+
Antimony	94	816
Arsenic	68	747,000
Arsenic(III)	NE	3,840
Arsenic(V)	NE	200 U
Barium	46,000	3.32
Beryllium	470	0.285 U
Cadmium	210	0.285 U
Calcium	NE	3.1 J+
Chloride	NE	5 U
Chromium	350,000	2.85 U
Cobalt	70	0.135 J
Copper	9,400	0.96 J
Iron	160,000	1,550 J
Lead	400	1.3
Magnesium	NE	7.6
Manganese	5,500	4.55
Mercury	28	1.33
Nickel	4,600	2.85 U
Potasium	NE	35.7 J+
Selenium	1,200	1.46 J
Silver	1,200	0.285 U
Sodium	NE	28.5 U
Thallium	2.3	0.285 U
Vanadium	1,200	1.68 J
Zinc	70,000	8.8 J
MMAs	NE	160 U
DMAs	NE	210 U

Notes:

DMAs	Dimethylarsinic acids
EPA	U.S. Environmental Protection Agency
J	The identification of the analyte is acceptable; the reported value is an estimate.
J+	The identification of the analyte is acceptable; the reported value is an estimate, with a high bias.
mg/kg	Milligrams per kilogram
MMAs	Monomethyl arsenic acids
NE	Not established
RML	Removal Management Level
W	Waste
WP	Wiley Property
	Shaded values equal or exceed the July 2015 EPA RML for arsenic in residential soil.

TABLE 3
WILEY PROPERTY
ANALYTICAL RESULTS FOR SURFACE AND SUBSURFACE SOIL SAMPLES

Sample ID	Arsenic EPA RML: 68 mg/kg
WP-102115-SF-01	76
WP-102115-SF-02	7,200
WP-102115-SF-02-DUP	6,000
WP-102115-SF-03	31,000
WP-102115-SF-04	2,700
WP-102115-SF-05	1,400
WP-102115-SF-06	93
WP-102115-SF-07	960
WP-102115-SF-08	67
WP-102115-SF-09	1,500
WP-102115-SF-10	1,400
WP-102115-SF-11	140 J+
WP-102115-SF-12	910
WP-102115-SF-13	63
WP-102115-SF-14	300
WP-102115-SF-15	4,700
WP-102115-SF-16	2,300
WP-102115-SF-17	2,000
WP-102115-SF-18	210
WP-102115-SF-19	68
WP-101515-SB-01	14,000
WP-101515-SB-02	5,200

Notes:

DUP	Duplicate
EPA	U.S. Environmental Protection Agency
ID	Identification
J+	The identification of the analyte is acceptable; the reported value is an estimate, with a high bias.
mg/kg	Milligrams per kilogram
RML	Removal Management Level
SB	Subsurface soil
SF	Surface soil
WP	Wiley Property
	Shaded values equal or exceed arsenic's July 2015 EPA RML for residential soil.

TABLE 4
WILEY PROPERTY
COMPARISON OF XRF AND ANALYTICAL RESULTS FOR SURFACE AND SUBSURFACE SOIL SAMPLES

Soil Sample ID	Arsenic EPA RML: 68 Soil Results mg/kg	Arsenic EPA RML: 68 XRF Results ppm	XRF Sample ID
WP-102115-SF-02	7,200	1,144.25	X103
WP-102115-SF-02-DUP	6,000	1,144.25	X103
WP-102115-SF-03	31,000	1,144.25	X103
WP-102115-SF-04	2,700	381.79	X114
WP-102115-SF-05	1,400	258.22	X123
WP-102115-SF-06	93	66.65	X125
WP-102115-SF-07	960	328.26	X130
WP-102115-SF-08	67	444.03	X133
WP-102115-SF-09	1,500	1536.5	X135
WP-102115-SF-10	1,400	1,067.04	X259
WP-102115-SF-11	140 J+	81.27	X63
WP-102115-SF-12	910	187.74	X69
WP-102115-SF-13	63	32.96	X70
WP-102115-SF-14	300	104.47	X77
WP-102115-SF-15	4,700	155.53	X87
WP-102115-SF-16	2,300	162.87	X88
WP-102115-SF-17	2,000	448.88	X92
WP-102115-SF-18	210	512.55	X61
WP-102115-SF-19	68	71.27	X253
WP-101515-SB-01	14,000	34,991.68	X42
WP-101515-SB-02	5,200	5,743.02	X46

Notes:

- Surface soil sample WP-102115-SF-01 was a composite sample; therefore, there is no corresponding XRF result for comparison.
- XRF screening values are reported in parts per million as a result of using a direct reading instrument. The analytical results for the samples are reported mg/kg from sampling. A milligram is a millionth of a kilogram and is commonly referred to as a part per million in order to compare the units.

DUP	Duplicate
EPA	U.S. Environmental Protection Agency
ID	Identification
J+	The identification of the analyte is acceptable; the reported value is an estimate, with a high bias.
mg/kg	Milligrams per kilogram
RML	Removal Management Level
ppm	Parts per million
SB	Subsurface soil
SF	Surface soil
WP	Wiley Property
XRF	X-ray fluorescence

TABLE 5
WILEY PROPERTY
XRF SCREENING RESULTS FOR SEDIMENT SAMPLES

Reading No	Time	Type	Units	As	As Error
140	10/20/2015 18:00	Sediment	ppm	<LOD	7.29
141	10/20/2015 18:02	Sediment	ppm	10.63	5.51
142	10/20/2015 18:04	Sediment	ppm	12.3	5.92
143	10/20/2015 18:05	Sediment	ppm	<LOD	12.32
145	10/20/2015 18:07	Sediment	ppm	13.06	6.66
146	10/20/2015 18:09	Sediment	ppm	1708.84	44.95
147	10/20/2015 18:11	Sediment	ppm	1453.16	36.99
148	10/20/2015 18:12	Sediment	ppm	80.07	9.6
149	10/20/2015 18:13	Sediment	ppm	133.41	12.26
150	10/20/2015 18:15	Sediment	ppm	47.61	9.14
151	10/20/2015 18:17	Sediment	ppm	122.43	12.42
152	10/20/2015 18:19	Sediment	ppm	843.05	27.18
153	10/20/2015 18:20	Sediment	ppm	1026.98	35.77
154	10/20/2015 18:22	Sediment	ppm	322.47	18.64
155	10/20/2015 18:25	Sediment	ppm	395.17	19.37
156	10/20/2015 18:26	Sediment	ppm	170.61	12.71
157	10/20/2015 18:28	Sediment	ppm	9.75	6.06
158	10/20/2015 18:29	Sediment	ppm	32.39	8.64
159	10/20/2015 18:31	Sediment	ppm	<LOD	9.92
160	10/20/2015 18:33	Sediment	ppm	<LOD	9.42
162	10/20/2015 18:39	Sediment	ppm	329.32	21.96
163	10/20/2015 18:40	Sediment	ppm	181.63	15.91
170	10/21/2015 10:15	Sediment	ppm	3430.73	60.17
171	10/21/2015 10:17	Sediment	ppm	<LOD	8.48
172	10/21/2015 10:19	Sediment	ppm	446.63	17.46
173	10/21/2015 10:23	Sediment	ppm	1461.16	39.11
174	10/21/2015 10:24	Sediment	ppm	<LOD	9.73
175	10/21/2015 10:26	Sediment	ppm	<LOD	7.62
176	10/21/2015 10:29	Sediment	ppm	1050.76	30.39
177	10/21/2015 10:30	Sediment	ppm	<LOD	9.97
178	10/21/2015 10:35	Sediment	ppm	601.92	23.33
181	10/21/2015 10:41	Sediment	ppm	338.57	19.22
182	10/21/2015 10:42	Sediment	ppm	230.24	13.41
183	10/21/2015 10:44	Sediment	ppm	10.91	5.81
184	10/21/2015 10:48	Sediment	ppm	353.98	23.7
185	10/21/2015 10:50	Sediment	ppm	<LOD	8.55
186	10/21/2015 10:53	Sediment	ppm	<LOD	10.14
187	10/21/2015 10:58	Sediment	ppm	346.36	23.52
188	10/21/2015 11:01	Sediment	ppm	<LOD	8.44
189	10/21/2015 11:09	Sediment	ppm	338.48	21.15
192	10/21/2015 11:16	Sediment	ppm	841.68	32.57
193	10/21/2015 11:18	Sediment	ppm	8.99	5.9
194	10/21/2015 11:19	Sediment	ppm	<LOD	7.88
195	10/21/2015 11:27	Sediment	ppm	109.88	12.51
196	10/21/2015 11:29	Sediment	ppm	<LOD	8.37
197	10/21/2015 11:30	Sediment	ppm	<LOD	7.71

TABLE 5
WILEY PROPERTY
XRF SCREENING RESULTS FOR SEDIMENT SAMPLES

Reading No	Time	Type	Units	As	As Error
198	10/21/2015 11:35	Sediment	ppm	170.28	20.81
199	10/21/2015 11:36	Sediment	ppm	<LOD	9.41
200	10/21/2015 11:38	Sediment	ppm	<LOD	8.31
201	10/21/2015 11:41	Sediment	ppm	106.58	15.05
202	10/21/2015 11:42	Sediment	ppm	56.05	8.75
203	10/21/2015 11:44	Sediment	ppm	8.66	5.69
204	10/21/2015 11:47	Sediment	ppm	38.39	8.4
205	10/21/2015 11:49	Sediment	ppm	140.47	11.44
206	10/21/2015 11:50	Sediment	ppm	<LOD	8.33
207	10/21/2015 11:53	Sediment	ppm	252.97	20.45
208	10/21/2015 11:54	Sediment	ppm	<LOD	9.21
209	10/21/2015 11:56	Sediment	ppm	15.45	8.39
211	10/21/2015 11:58	Sediment	ppm	253.43	19.56
212	10/21/2015 12:00	Sediment	ppm	25.7	5.84
213	10/21/2015 12:01	Sediment	ppm	46.35	8.06
214	10/21/2015 12:04	Sediment	ppm	66.29	10.9
215	10/21/2015 12:06	Sediment	ppm	<LOD	7.31
216	10/21/2015 12:08	Sediment	ppm	<LOD	7.18
217	10/21/2015 12:10	Sediment	ppm	118.98	13.66
218	10/21/2015 12:12	Sediment	ppm	138.93	12.15
219	10/21/2015 12:14	Sediment	ppm	<LOD	7.93
220	10/21/2015 12:16	Sediment	ppm	90.64	10.1
221	10/21/2015 12:18	Sediment	ppm	127.2	12.92
222	10/21/2015 12:19	Sediment	ppm	17.8	5.62
223	10/21/2015 12:22	Sediment	ppm	40.2	8.67
224	10/21/2015 12:23	Sediment	ppm	14.16	6.39
225	10/21/2015 12:25	Sediment	ppm	15.96	8.12
226	10/21/2015 12:31	Sediment	ppm	99.88	12.23
227	10/21/2015 12:33	Sediment	ppm	<LOD	8.83
228	10/21/2015 12:34	Sediment	ppm	8.94	5.83
242	10/21/2015 16:06	Sediment	ppm	<LOD	8.53
244	10/21/2015 16:10	Sediment	ppm	<LOD	6
245	10/21/2015 16:13	Sediment	ppm	79.68	10.81
246	10/21/2015 16:16	Sediment	ppm	13.34	6.06
247	10/21/2015 16:21	Sediment	ppm	165.42	14.11
248	10/21/2015 16:24	Sediment	ppm	21.35	10.88
249	10/21/2015 16:26	Sediment	ppm	66.49	9.26
250	10/21/2015 16:29	Sediment	ppm	1021.29	29.52
251	10/21/2015 16:32	Sediment	ppm	1273.75	56.52

TABLE 5
WILEY PROPERTY
XRF SCREENING RESULTS FOR SEDIMENT SAMPLES

Notes:

As	Arsenic
<LOD	Less than the level of detection
No.	Number
ppm	Parts per million
XRF	X-ray fluorescence

Because of misfires or connectivity issues, not all of the XRF screenings listed in the above table are depicted on Figure 4.

TABLE 6
WILEY PROPERTY
ANALYTICAL RESULTS FOR SEDIMENT SAMPLES

Sample ID	Arsenic EPA ESV: 9.8 mg/kg
WP-102115-SD-01	130
WP-102115-SD-02	210
WP-102115-SD-03	510
WP-102115-SD-04	2,400
WP-102115-SD-05	4,200
WP-102115-SD-05-DUP	4,700

Notes:

DUP	Duplicate
EPA	U.S. Environmental Protection Agency
ESV	Ecological Screening Value
ID	Identification
mg/kg	Milligrams per kilogram
SD	Sediment
WP	Wiley Property

Shaded values exceed the 2015 EPA ESV for arsenic in freshwater sediment.

TABLE 7
WILEY PROPERTY
ANALYTICAL RESULTS FOR VACUUM SAMPLES

Sample ID	Arsenic µg/cm^3
WP-102015-VC-01	0.05 U
WP-102015-VC-02	0.05 U
WP-102015-VC-03	0.05 U
WP-102015-VC-04	0.05 U
WP-102015-VC-05	0.05 U
WP-102015-VC-06	0.05 U
WP-102015-VC-07	0.05 U
WP-102015-VC-08	0.05 U
WP-102015-VC-09	0.05 U
WP-102015-VC-10	0.05 U
WP-102015-VC-FB01	NA

Notes:

DUP	Duplicate
ID	Identification
NA	Not applicable
µg/cm^3	Micrograms per cubic centimeter
U	Analyte not detected at or above the corresponding reporting limit.
VC	Vacuum
WP	Wiley Property

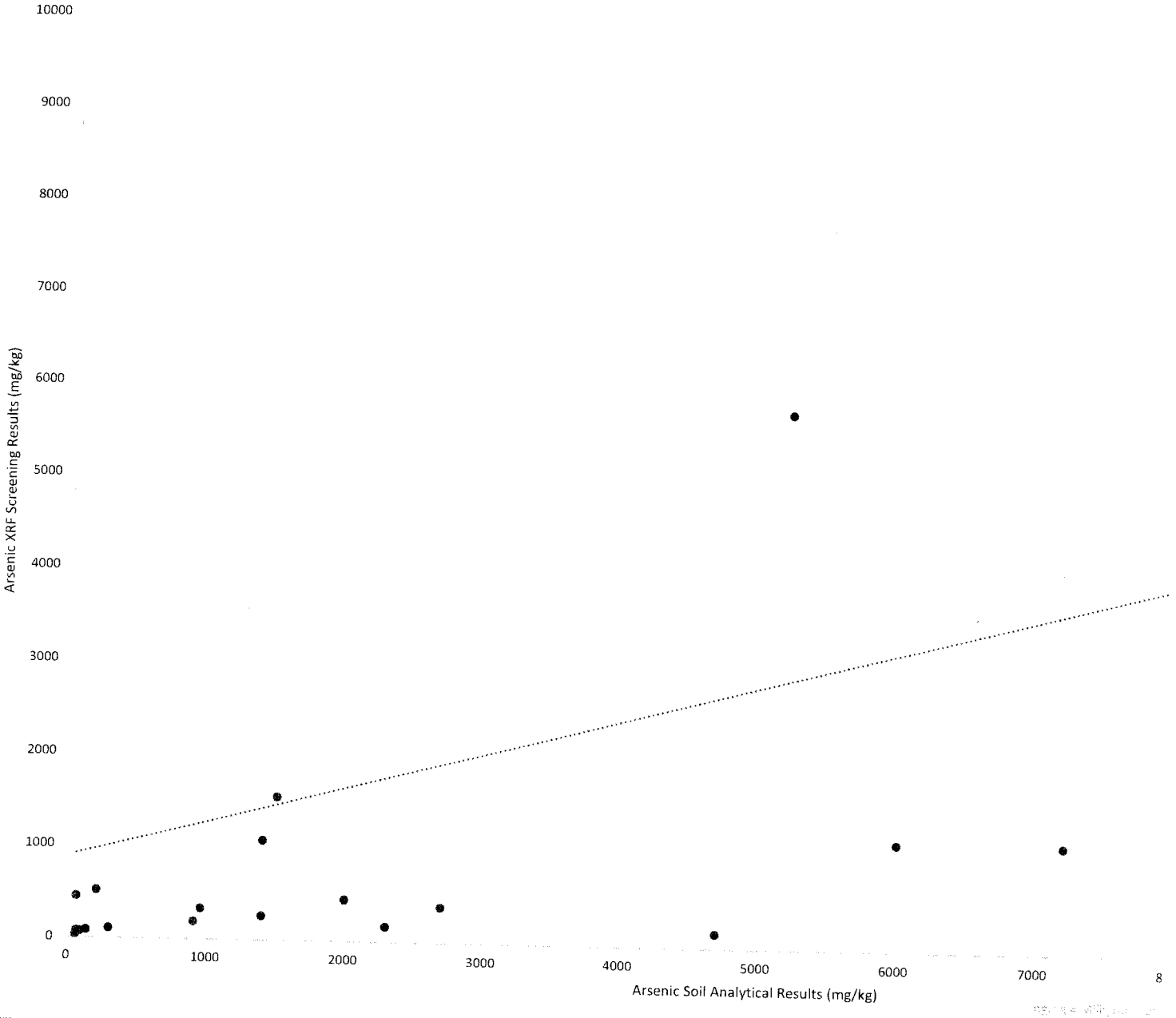
TABLE 8
WILEY PROPERTY
ANALYTICAL RESULTS FOR AIR SAMPLES

Sample ID	Arsenic EPA RSL: 0.65 OSHA PEL: 0.010 mg/m^3	
March 2015		
WP-032415-AA-01	0.0033	U
WP-032415-AA-02	0.0033	U
WP-032415-AA-FB	NA	
October 2015		
WP-102115-PA-01	0.00057	U
WP-102115-PA-02	0.00088	U
WP-102115-AA-01	0.00068	U
WP-102115-AA-02	0.00069	U
WP-102115-AA-03	0.00066	U
WP-102115-AA-04	0.00066	U
WP-102115-AA-05	0.00067	U
WP-102115-AA-06	0.00067	U
WP-102115-AA-FB01	NA	

Notes:

AA	Ambient air
DUP	Duplicate
EPA	U.S. Environmental Protection Agency
ID	Identification
mg/m^3	Milligrams per cubic meter
NA	Not applicable
OSHA	U.S. Occupational Safetly and Health Administration
PA	Personal air
PEL	Permissible Exposure Limit
RSL	November 2015 EPA Regional Screening Level for residential air
U	Analyte not detected at or above the corresponding reporting limit.
WP	Wiley Property

GRAPH 1
WILEY PROPERTY
CORRELATION BETWEEN SOIL ANALYTICAL RESULTS AND XRF SCREENING RESULT

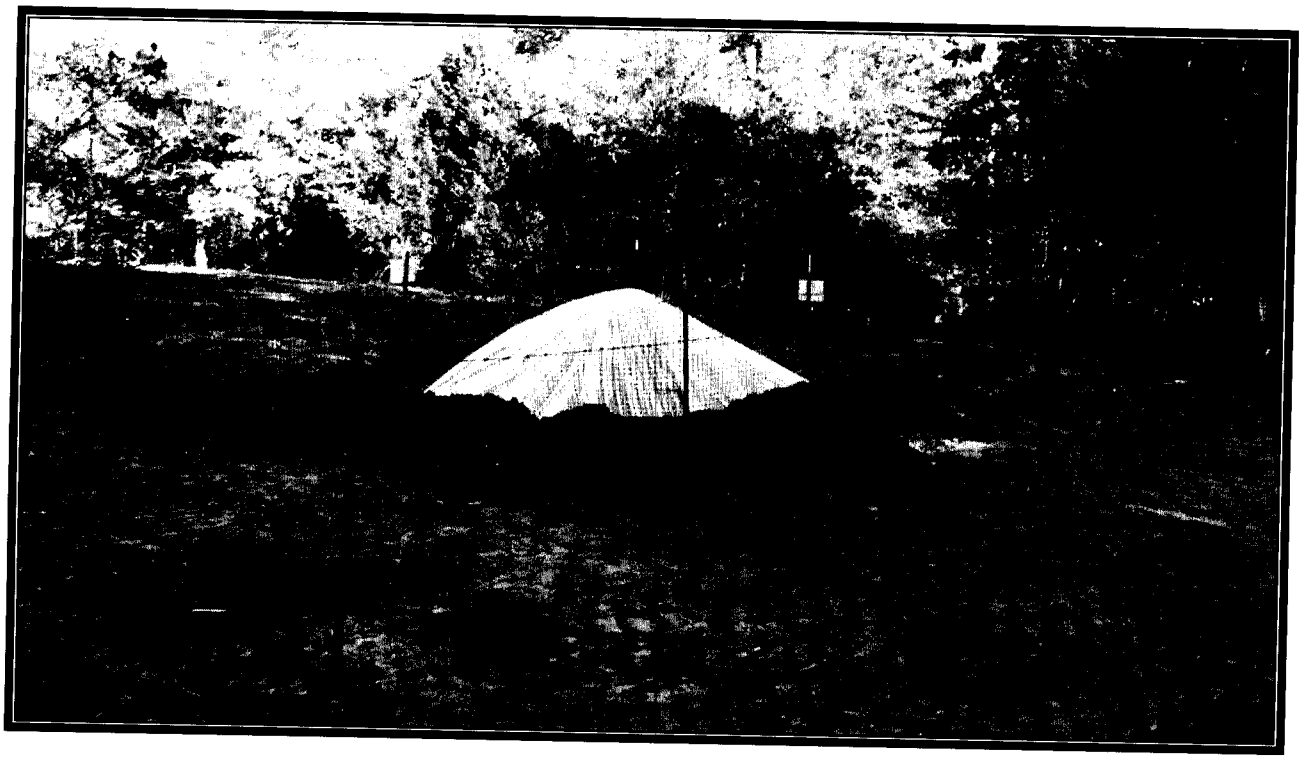


TETRA TECH

ENCLOSURE 3

PHOTOGRAPHIC LOG

(10 Pages)



OFFICIAL PHOTOGRAPH NO. 1
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	Northeast	**Date:**	October 20, 2015
Photographer:	Paul Prys	**Witness:**	Dale Von Busch

Subject: The Emergency and Rapid Response Services (ERRS) contractor, CMC, Inc. (CMC), installed an earthen berm around the source pile and covered it with plastic sheeting to prohibit additional migration of arsenic contamination.

OFFICIAL PHOTOGRAPH NO. 2
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	Southwest	**Date:**	October 20, 2015
Photographer:	Paul Prys	**Witness:**	Dale Von Busch

Subject: Non vegetative area extending approximately 75 feet downgradient of the source pile.

OFFICIAL PHOTOGRAPH NO. 3
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	Northwest	**Date:**	October 21, 2015
Photographer:	Dale Von Busch	**Witness:**	Leslie Shaver

Subject: Tetra Tech and Oneida Total Integrated Enterprises (OTIE) START conducted x-ray fluorescence (XRF) screening of the surface soil to determine the extent of the arsenic contamination downgradient from the source pile in intervals of every 10 feet using a Thermo Scientific Niton XL3t XRF Analyzer (Niton). Soil samples were collected at randomly selected locations to compare to XRF screening results.

OFFICIAL PHOTOGRAPH NO. 4
U.S. ENVIRONMENTAL PROTECTION AGENCY

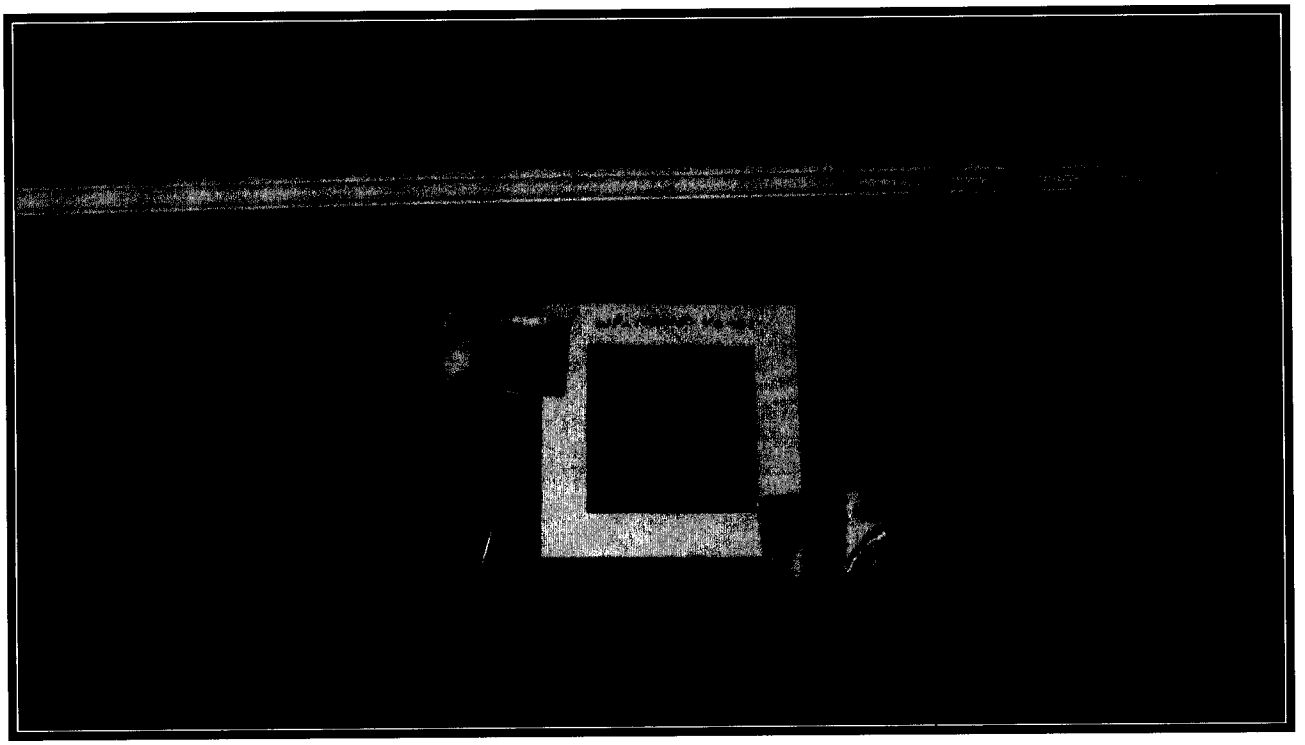
TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	Northwest	**Date:**	October 21, 2015
Photographer:	Dale Von Busch	**Witness:**	Geoie Krull

Subject: Tetra Tech and OTIE START conducted XRF screening of the surface sediment in the dry creek bed in intervals of every 100 feet to determine the extent of the arsenic contamination downgradient from the source pile using a Niton. Five sediment samples were collected at approximately equidistant locations from the dry creek bed.

OFFICIAL PHOTOGRAPH NO. 5
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	Not applicable	**Date:**	October 21, 2015
Photographer:	Tetra Tech, Inc.	**Witness:**	Tetra Tech, Inc.

Subject: Global positioning system (GPS) coordinates were collected at each XRF screening and soil and sediment sampling location.



OFFICIAL PHOTOGRAPH NO. 6
U.S. ENVIRONMENTAL PROTECTION AGENCY

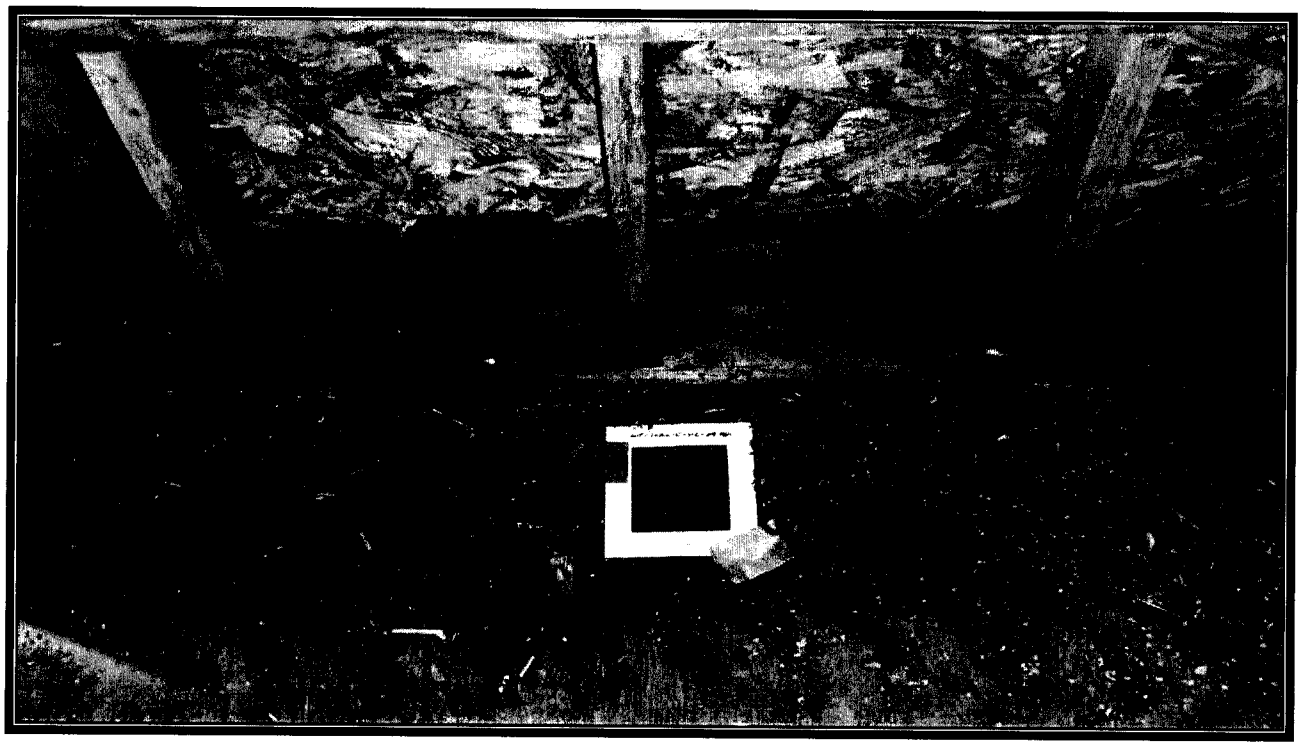
TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	Not applicable	**Date:**	October 20, 2015
Photographer:	Paul Prys	**Witness:**	Dale Von Busch

Subject: Tetra Tech START conducted vacuum sampling for arsenic dust on the floor of the house approximately two to four inches from the wall within a 10 centimeter (cm) by 10 cm area. Samples were collected using 0.8 micrometer (µm) match weight mixed cellulose ester (MCE) filters attached to a Gilian GilAir Tri-Mode Air Sampler (Gilian) low volume air sampling pump.

OFFICIAL PHOTOGRAPH NO. 7
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	West	**Date:**	October 20, 2015
Photographer:	Paul Prys	**Witness:**	Dale Von Busch

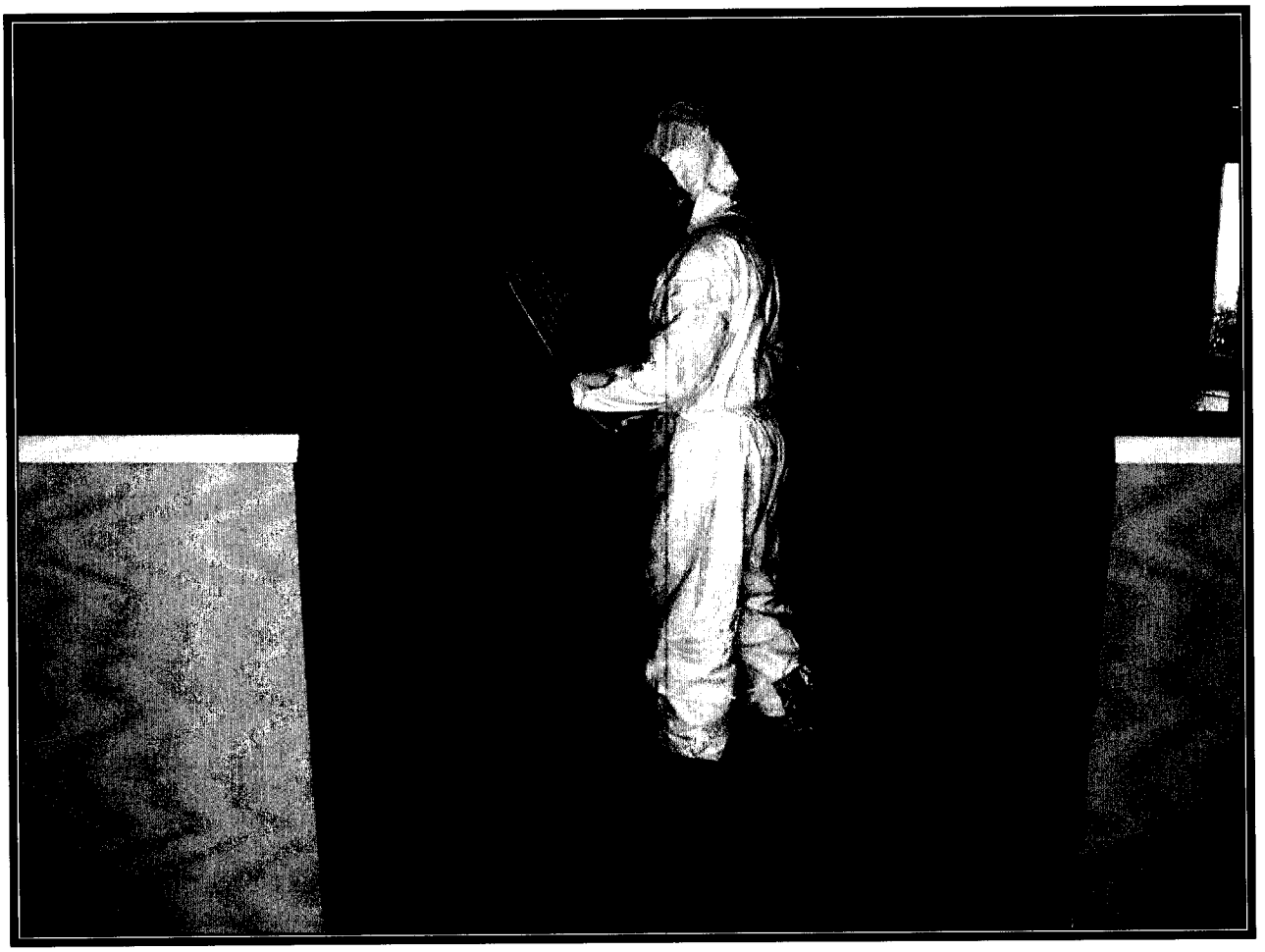
Subject: Tetra Tech START conducted vacuum sampling for arsenic dust on the floor of the house approximately two to four inches from the wall within a 10 cm by 10 cm area. Samples were collected using 0.8 µm match weight MCE filters attached to a Gilian low volume air sampling pump.



OFFICIAL PHOTOGRAPH NO. 8
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	Not applicable	**Date:**	October 20, 2015
Photographer:	Paul Prys	**Witness:**	Dale Von Busch

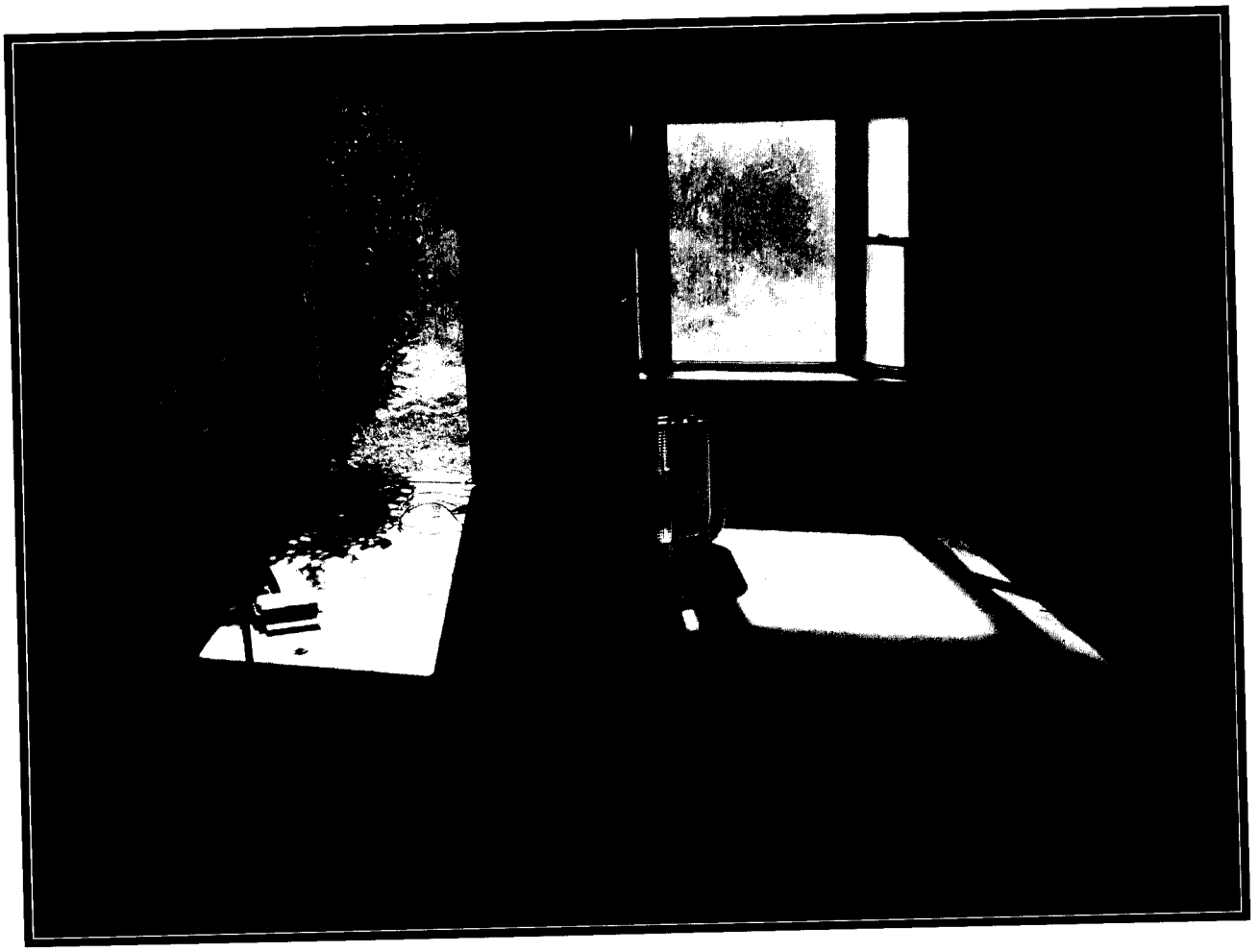
Subject: Tetra Tech START conducted vacuum sampling for arsenic dust on the floor of the cabin approximately two to four inches from the wall within a 10 cm by 10 cm area. Samples were collected using 0.8 μm match weight MCE filters attached to a Gilian low volume air sampling pump.



OFFICIAL PHOTOGRAPH NO. 9
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	West	**Date:**	October 21, 2015
Photographer:	Dale Von Busch	**Witness:**	Paul Prys

Subject: Prior to conducting area air sampling, Tetra Tech personnel stirred up the dust throughout the house and cabin using a 20 inch box fan connected to a portable generator.



OFFICIAL PHOTOGRAPH NO. 10
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TT-02-002	**Location:**	Hartford, Kentucky
Orientation:	East	**Date:**	October 21, 2015
Photographer:	Paul Prys	**Witness:**	Dale Von Busch

Subject: Area air samples were collected in the center of each sampling area in the house and cabin at a height of four to five feet representing the breathing zone. A 20 inch box fan was placed in each sampling area to create air circulation and stir up dust during sampling. Samples were collected using Gilian low volume air sampling pumps with 0.8 μm match weight MCE filters attached.

ENCLOSURE 4

FIELD LOGBOOKS

(15 Pages)

TT-02-002

Wiley Property

Rite in the Rain

ALL-WEATHER

UNIVERSAL

№ 371

Wiley Property

3/24/15-

2 3/24/15 Cloudy 60°

0900- Sherry Wiedman, Brandon Helm, Dale Vonbusch onsite
- Health and Safety briefing conducted and plan signed.
- Set up equipment and supplies for field event.

1052- Air Sampling begins for:
WP-032415-AA-01
WP-032415-AA-02

1055- XRF screening and GPS collection begins up drive way from Shinkle Chapel Rd.
- Note winds are very light. Sky is overcast. Approx 60°
- No readings on XRF for Arsenic above 50 ppm along drive up to house and small cabin.
- Front foyer of house has tile floor. Approx 4.5' inside from door reading of 774 with ±291 ppm for Arsenic on floor tile.

Scale: 1 square = _____

3/24/15

- Screening in a
contamination rev
high levels with
1300- Sampling beg
zone contami
1325- Air Samples st
- All samples
placed in containe
office for process

- Screening conducte
suspected historic
reveal high levels
Screenings were
- Charlie Shields,
Pat Hardesty, Regional
onsite at the hous
site activities to
- Equipment, supplies
personnel decon an
Boots in House, and
1400- Tetra Tech
officials offsite.

Scale: 1 square = _____

4 3/24/15 Cloudy 60°

Air Sampling:
- Sample WP-032415-AA-01 calibrated to 2.082 LPM
- Sample WP-032415-AA-02 calibrated to 2.064 LPM

1052 - Sampling begins
1325 - Sampling stops and post calibration is as follows:
WP-032415-AA-01 = 2.063 LPM
WP-032415-AA-02 = 2.024 LPM
WP-032415-AA-FB collected at 1325 as well.
WP-032415-AA-01 average = 2.073
WP-032415-AA-02 average = 2.044

Water ~~Dro~~ Sampling:
- Sample WP-032415-W & WP-032415-W-DUP ~~collected @ 1300~~ & WP-032415-W-FB collected @ 1300

Scale: 1 square = _____

Scale: 1 square = _____

TT-02-002

Wiley Property

Rite in the Rain

ALL-WEATHER

UNIVERSAL

№ 371FX

10/20/15 -

Soil

10/20/15

0830 START Arrives on-site. Meet with OTTE.
Weather is clear and 60°F with a slight
breeze from the west. Set up decon
station and hold team safety meeting
1000 Crew dons PPE and begins site survey
XRF misfire on #62
1130 - take break
1230 - resume work - XRF Screening
XRF misfire #83
XRF misfire #80

on trimble reading x82 is actually
recorded as x81
reading x81 is recorded as x80
- points were re-labeled correctly in trimble
1400 - Break for lunch
1600 - Resume work
XRF misfire #144

Scale: 1 square =

10/21/15

1430 - XRF SCREENIN
HILL, WHERE DRA
DRY CREEK BED
EXTENT OF HIGH A
1503 - X242 - ND
X243 - MISSFI
X244 - ND
X245 - 80
X246 - 13
X247 - 165
X248 - 21
X249 - 66
X250 - 1,021 IN E
X251 - 1,274 "
X252 - 24
NEXT READINGS ARE
SOUTH OF MADSEN RC
X253 - 71
X254 - 432
X255 - 654
~~X2~~ ND
X256 - 1,315
X257 - 60

Scale: 1 square =

X258 - 173
X259 - 1,067
X260 - 457

Soil sample collection		XRF screening H, L, or M	
SF-02	10/21/15 1709	1155	H
SF-02 dup	1712		
MISS SF-03	1715	27,000	H
SF-04	1718	412	M
SF-05	1722	409	M
SF-06	1725	67	L
SF-07	1727	314	M
SF-08	1730	69	L
SF-09	1733	5992	H
* SF-10	1739	1288	H
MISS SF-11	1757	60	L
SF-12	1754	346	M
SF-13	1758	36	L
SF-14	1801	114	L
SF-15	1804	493	M
SF-16	1806	382	M
SF-17	1809	273	M
SF-18	1818	107	L
SF-19	1822	47	L

Scale: 1 square = _____

Scale: 1 square = _____

TT-02-002

Wiley Property

Rite in the Rain

ALL-WEATHER

UNIVERSAL

№ 371FX

10/20/15-

Sediment

10/20/15

0830 START Arrives on-site and meets OTIE
Weather is clear and 60°F with a slight
breeze from the west. Setup decon
station and hold a team safety meeting
XRF Misfire #161

Scale: 1 square = _____

10/21/15 Wiley Proper

0735 START onsite
Weather: clear, 60°s and
Work plan: continue scree
and conduct air sampli
Sampling on XRF s

x177 & x176 XRF sc
located ~ 100ft down
X174, & x175, u
to record GPS coordi
XRF readings that
(misfire) #210
- Sample collection for
SD-01 =
SD-02 =
SD-03 =
SD-04 =
SD-05 =
SD-05 Du

Scale: 1 square = _____

stream description starting at furthest downstream XRF sampling location

1st 100 ft - ~15 ft wide, banks 2-4 ft high
2nd " " - ~10-15 ft wide, banks 3-8 ft high
3rd " : ~10-12 ft wide, " 2-4 ft
4th " same as above
5th " same as above
6th " = 4-6 ft wide, 2-3 ft banks, meandering
7th " = 6-10 ft wide, 1-2 ft banks meandering
8th " = 4-6 ft wide, multiple channels, 1-2 ft banks
9th " : " " single " 1-2 ft banks
10th " = 4-6 ft wide, single channel, 2-4 ft banks
11th " : same as above
12th " = 4-6 ft wide, single channel, 2-6 ft bank
~~13th = <1 ft to 3 ft~~
13th " = 4-6 ft wide, single channel, <1 ft to 4 ft banks
14th " - 4-6 ft wide, single, 2-4 ft banks
15th " - 3-8 ft wide, single, 3-6 ft banks
16th " - 3-4 ft wide, 2 channels, 3-6 ft
17th " - 2-6 ft wide, 2 " , 2-6 ft
18th " : 2-3 ft wide, anastomosing, <1 ft to 2 ft
19th " : 2-5 ft wide, single to anastomosing, <1 ft to 3 ft
20th " = 3-5 ft wide, single channel, 3-6 ft banks
21st " - 2-4 ft wide, 2 channels, 2-4 ft

Scale: 1 square = _____

stream description cont
22nd 100 ft;

Scale: 1 square = _____

TT-02-002

Wiley Property

Rite in the Rain
ALL-WEATHER
UNIVERSAL
№ 371FX

10/20/15 -

AIR

INCH

MADE IN TACOMA
— SINCE 1916 —
Rite in the Rain®
— DEFYING MOTHER NATURE —

Name Wiley Property

Address 209 Shinkle Chapel Rd
Hartford, KY

Phone

Project TT-02-002

RiteintheRain.com

CONTE

PAGE REFEREN

TE START PAUL F
TE START DALE C
TE START LESLIE
TE START DARRE
TE START GEOIE
OTIE START STACE

October 20, 2015

WEATHER: High of 74°F, Sunny, Winds from southwest up to 10 mph

0830 TE START ON SITE AND MET up with OTIE START. START PRYS conducted health and safety briefing. TE AND OTIE START set up to conduct screening for ARSENIC using an XRF to delineate site contamination.

1000 START PRYS PREPARED TO conduct vacuum sampling in the site house and cabin. START PRYS calibrated a GilAir 5 Trimode air sampler (Pump 51) to 3.03 lpm. Sampling was conducted using MATCH weighted MCE 3pc 0.8 µm filters obtained from ALS Environmental, Cincinnati, OHIO. Samples will be analyzed via NIOSH 7300 method.

1045 START PRYS ENTERED THE HOUSE AND CABIN TO SKETCH THE LAYOUTS. THE REAR DOOR WINDOW WAS BROKEN IN THE HOUSE ALONG WITH A SOUTHEAST BEDROOM WINDOW. THE front door of the cabin was partially demolished.

Scale: 1 square =

October 20, 2015

1208 Collected WP-10
southwest AREA
field sheet). STA
x 10cm template
vacuumed the A
with a tubing
to the GilAir 5
was connected
left to right in
and then up an
pattern. Once
complete, the f
caps replaced
was placed in a
vacuum sp(?) b
collected in th
1220 Collected WP-
the southwest a
(see field she
1228 Collected WP-
the southeast a
(see field sheet
1240 Collected WP-1
the east side of

Scale: 1 square =

October 20, 2015

1240 field sheet).

1247 Collected WP-102015-VC-05 from south area of foyer. (see field sheet)

1254 Collected WP-102015-VC-06 from north area of utility room (see field sheet).

1307 Collected WP-102015-VC-07 from west side of Bedroom 3 (2nd floor) (see field sheet).

1319 Collected WP-102015-VC-08 from north end of Bedroom 3 (2nd floor) (see field sheet).

1332. Collected WP-102015-VC-09 from the east side of the cabin under the Bay window. (see field figure).

1341 Collected WP-102015-VC-10 from the southwest area of the cabin. (see field figure.

Note: All vacuum samples were collected from the floor approximately 2 to 4 inches from the baseboard/wall.

1345 Took photographs of the house and cabin and decontaminated equipment. and assisted screening team.

Scale: 1 square = [signature] 20 Oct 2015 —

October 21, 2015

weather: High of 79°
From southwe

0745 Tt start on site
start. Discussed
in creek bed dou

0820 Starts Prys and
set up to condu
sampling in hom
box fans. Start p
Gilair 5 pumps
sampling during
sediment screeni
sampling.

0858 Began collecting
WP-102115-PA-01
for sediment scre
soil sampling. Con
area air pumps
sampling.

0920 Began setting up
house and cabin
to portable gene
personal air sam
on Tt Paul Prys fo

Scale: 1 square = [signature]

October 21, 2015

0920 Air sampling. See COC for flow rates.

0940 Entered cabin in Level C PPE.

Turned box fan on high, pointed the fan at the floor to stir up settled dust, and stirred up dust throughout the cabin for approximately 2 minutes. Placed the fan on the floor on high in front of the bay window, pointed it at the south wall at an angle to allow circulation around the room.

0958 Began collecting WP-102115-AA-06 in the center of the cabin. See COC for flow rate.

1000 Entered house. and place 5 box fans in the foyer, bedrooms 1, 2, 3 and the dining room. The sampling pumps were placed in the middle of each room. The box fans associated with each sampling area were turned on high and used to stir up the dust in each room in the same manner as the cabin. The fans were placed in each room and directed at an angle to a wall to promote circulation in the room.

Scale: 1 square =

October 21, 2015

1006 Began collecting
the 1st Floor livin
Began collecting
the 1st floor bedr
Note: At 0957, began
WP-102115-AA-
Bedroom 3 of th
WP-102115-AA-
Bedroom 1.

1007 Began collectin
1st Floor, Bedroo
Began collectin
the 1st Floor din
See COC for A

1100 OSC Art Smith
OSC Smith on site
Discussed soil/se

1400 OSC Smith off-sit
house and cabin
sampling pumps

1500 Porta-toilet p
off-site.

1543 Collected WP-10
stopped runner

Scale: 1 square =

October 21, 2015

1543 up and worn accidentally by Tt Krull during sediment sampling. Start Prys wore sample WP-102115-PA-01 while checking on sampling pumps in house/cabin. Tt Krull were given sample WP-102115-PA-01 to wear while collecting soil samples for the rest of the day.

1630 Tt Prys entered house and cabin to check on air sampling pumps.

1754 Collected WP-102115-AA-06 from the cabin.

1759 Collected WP-102115-AA-05 from the house.

1807 Collected samples WP-102115-AA-01 through WP-102115-AA-04 from the house. Tt Von Busch collected the portable generators and extension cords. Generators were deconned on site and extesion cords were bagged for decon at office.

1828 Collected WP-102115-PA-01 from Tt Krull. Start Prys deconned pumps,

Scale: 1 square = [illegible]

October 21, 2015

1829 tubing and sam
Tt staff deconn
Prys post-calib
pumps. See CDR
Packed up sam
1920 Tt and OTIE st
and will demob.

[illegible]

Scale: 1 square =

ENCLOSURE 5

DATA VALIDATION REPORT FOR MULTI-MEDIA SAMPLING

(87 Pages)

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	Wiley Property	**Project No.**	TT-02-002
Data Reviewer (signature and date)	Jessica A. Vickers December 4, 2015	**Laboratory/Report No.**	ALS Environ
Analyses	Target Analyte List (TAL) Metals – SW6010C/6020A/7471B and chloride – EPA 300.0		
Samples	WP-032415-W		

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the E Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 20 evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Data Re* validation guidance document, as well as the above referenced methods.

OVERALL EVALUATION:

Rejection of data was not required for this data package. Results were qualified due to exceedances for method blanks. the qualifications indicated in this checklist.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
N	Arsenic = 7.4 mg/kg, calcium = 1.1 mg/kg, potassium = 13.1 mg/kg, and thallium = 0.002 mg/kg – flag "J+ potassium

Field blanks:

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
N	High %R for aluminum – flag "J+" High %R for antimony, arsenic, and iron – no action (parent result greater than 4 times spike concentration)

Post digestion spikes:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Serial dilutions:

Within Criteria	Exceedance/Notes
Y	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
N	High RPD for aluminum and iron – flag "J" for iron (aluminum overridden due to MS/MSD)

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

Total versus dissolved metals results evaluation:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Toxicity equivalents (TEQs) and isomer specificity (dioxins/furans, cBaP, and PCB congeners only):

Within Criteria	Exceedance/Notes
NA	

Sample dilutions:

Within Criteria	Exceedance/Notes	
Y	2x: SW6010C metals except arsenic and chloride 5x: mercury	100x: SW6020A metals 500x: arsenic

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Estimated detection limit (EDL), estimated maximum possible concentration (EMPC), and target analyte identifi only):

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The a present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is cor to deficiencies in one or more quality control criteria.

ALS Group USA, Corp.
dba ALS Environmental

Metals
- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Tetra Tech EM, Incorporated
Project No.: NA
Project Name: Wiley Property
Matrix: SOIL

Service Request: K1503521
Date Collected: 03/24/15
Date Received: 04/06/15
Units: mg/Kg
Basis: DRY

Sample Name: WP-032415-W
Lab Code: K1503521-001

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Aluminum	6010C	2.9	0.4	2.0	04/09/15	04/14/15	792	J+	~~NR~~
Antimony	6020A	0.713	0.143	100.0	04/09/15	04/17/15	816		
Arsenic	6010C	713	143	500.0	04/09/15	04/14/15	747000		
Barium	6020A	0.71	0.29	100.0	04/09/15	04/17/15	3.32		
Beryllium	6020A	0.285	0.071	100.0	04/09/15	04/17/15	0.071	U	
Cadmium	6020A	0.285	0.100	100.0	04/09/15	04/17/15	0.100	U	
Calcium	6010C	2.9	0.6	2.0	04/09/15	04/14/15	3.1	J+	
Chromium	6020A	2.85	0.86	100.0	04/09/15	04/17/15	0.86	U	
Cobalt	6020A	0.285	0.086	100.0	04/09/15	04/17/15	0.135	J	
Copper	6020A	1.43	0.57	100.0	04/09/15	04/17/15	0.96	J	
Iron	6010C	2.9	1.4	2.0	04/09/15	04/14/15	1550	J	~~e~~
Lead	6020A	0.71	0.29	100.0	04/09/15	04/17/15	1.30		
Magnesium	6010C	1.43	0.14	2.0	04/09/15	04/14/15	7.60		
Manganese	6020A	0.71	0.29	100.0	04/09/15	04/17/15	4.55		
Mercury	7471B	0.115	0.012	5.0	04/09/15	04/09/15	1.33		
Nickel	6020A	2.85	0.43	100.0	04/09/15	04/17/15	0.43	U	
Potassium	6010C	28.5	6.4	2.0	04/09/15	04/14/15	35.7	J+	
Selenium	6020A	14.3	1.00	100.0	04/09/15	04/17/15	1.46	J	
Silver	6020A	0.285	0.057	100.0	04/09/15	04/17/15	0.057	U	
Sodium	6010C	28.5	2.9	2.0	04/09/15	04/14/15	2.9	U	
Thallium	6020A	0.285	0.029	100.0	04/09/15	04/17/15	0.029	U	
Vanadium	6020A	2.85	0.29	100.0	04/09/15	04/17/15	1.68	J	
Zinc	6020A	14.3	2.9	100.0	04/09/15	04/17/15	8.8	J	

% Solids: 79.7

Comments:

JW
12/04/15

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Tetra Tech EM, Incorporated	**Service Request:**	K1503521
Project:	Wiley Property	**Date Collected:**	03/24/15
Sample Matrix:	Soil	**Date Received:**	04/6/15
Analysis Method:	300.0	**Units:**	mg/Kg
Prep Method:	Method	**Basis:**	Dry

Chloride

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
WP-032415-W	K1503521-001	~~ND U~~	50 U	-	2	04/20/15 15:42	4/20/15	
~~Method Blank~~	~~K1503521-MB~~	~~ND U~~	~~2.0~~	~~-~~	~~1~~	~~04/20/15 12:08~~	~~4/20/15~~	

gaw
12/04/15

Printed 4/22/2015 11:28:21 AM

Superset Reference:15-0000327397 rev 00

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	Wiley Property	**Project No.**	TT-02-002
Data Reviewer (signature and date)	Jessica A. Vickers December 4, 2015	**Laboratory/Report No.**	Brooks Rand/ Report
Analyses	Speciated Arsenic – IC-ICP-DRC-MS		
Samples	WP-032415-W		

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the E Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 20(evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Data Re* validation guidance document, as well as the above referenced methods.

OVERALL EVALUATION:

Rejection of data was not required for this data package. No additional qualifications were required for the data set base data can be used as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	Laboratory inadvertently labeled sample as WP-03245-W – sample name was manually corrected in the att

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
N	Arsenic (III) = 60 mg/kg – no action (associated result greater than ten times blank value)

Field blanks:

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Serial dilutions:

Within Criteria	Exceedance/Notes
N	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
Y	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

Total versus dissolved metals results evaluation:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Toxicity equivalents (TEQs) and isomer specificity (dioxins/furans, cBaP, and PCB congeners only):

Within Criteria	Exceedance/Notes
NA	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Estimated detection limit (EDL), estimated maximum possible concentration (EMPC), and target analyte identifi only):

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The a present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is cor to deficiencies in one or more quality control criteria.

Arsenic Results for TestAmerica
Project Name: Wiley Property
Contact: Jessica Vickers

Report Date: April 28, 2015
Report Generated by: Russell Gerads
Brooks Rand Labs, LLC

Sample Results

Sample ID	As(III)	As(V)	MMAs	DMAs
WP-03245-W	3840	< 200 U	< 160 U	< 210 U

All results reflect the applied dilution and are reported in mg/kg
U = Concentration is below the eMDL

12/04/15

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	Wiley Property	**Project No.**	TT-02-002
Data Reviewer (signature and date)	Jessica A. Vickers December 4, 2015	**Laboratory/Report No.**	ALS Environ
Analyses	Arsenic – NIOSH 7300 mod.		
Samples	WP-032415-AA-01 and WP-032415-AA-02		
Field Blanks	WP-032415-AA-FB		

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the E Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 20(evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Data Re* validation guidance document, as well as the above referenced methods.

OVERALL EVALUATION:

Rejection of data was not required for this data package. No additional qualifications were required for the data set base data can be used as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

Total versus dissolved metals results evaluation:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Toxicity equivalents (TEQs) and isomer specificity (dioxins/furans, cBaP, and PCB congeners only):

Within Criteria	Exceedance/Notes
NA	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Estimated detection limit (EDL), estimated maximum possible concentration (EMPC), and target analyte identifi only):

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The a present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is cor to deficiencies in one or more quality control criteria.

ALS Environmental

Date: *03-Apr-15*

Client: Tetra Tech, Inc.
Project: Wiley Property

Work Order: 1503827

Analytical Results

Lab ID: 1503827-01A
Client Sample ID: WP-032415-AA-01

Collection Date: 3/24/2015 1:25:00 PM
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **304.73** Analyst: **VAW**

Date Analyzed: 3/31/2015 12:00

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1 0 U	0.0033 U

Lab ID: 1503827-02A
Client Sample ID: WP-032415-AA-02

Collection Date: 3/24/2015 1:25:00 PM
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **300.47** Analyst: **VAW**

Date Analyzed: 3/31/2015 12:03

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0 U	0.0033 U

Lab ID: 1503827-03A
Client Sample ID: WP-032415-AA-FB

Collection Date: 3/24/2015 1:25:00 PM
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **0** Analyst: **VAW**

Date Analyzed: 3/31/2015 12:06

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0 U	NA

12/04/15

Note:

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	Wiley Property	**Project No.**	TT-02-002
Data Reviewer (signature and date)	Jessica A. Vickers December 4, 2015	**Laboratory/Report No.**	ALS Environ
Analyses	Arsenic – NIOSH 7300 mod.		
Samples	WP-102115-AA-01, WP-102115-AA-02, WP-102115-AA-03, WP-102115-AA-04, WP-1021 WP-102115-AA-06, WP-102115-PA-01, and WP-102115-PA-02		
Field Blanks	WP-102115-AA-FB01		

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the E Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 20(evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Data Re* validation guidance document, as well as the above referenced methods.

OVERALL EVALUATION:

Rejection of data was not required for this data package. No additional qualifications were required for the data set base data can be used as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

Total versus dissolved metals results evaluation:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Toxicity equivalents (TEQs) and isomer specificity (dioxins/furans, cBaP, and PCB congeners only):

Within Criteria	Exceedance/Notes
NA	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Estimated detection limit (EDL), estimated maximum possible concentration (EMPC), and target analyte identifi only):

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The a present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is cor to deficiencies in one or more quality control criteria.

ALS Environmental

Date: *27-Oct-15*

Client: Tetra Tech, Inc.
Project: 103X902702002.001F

Work Order: 15101119

Analytical Results

Lab ID: 15101119-01A
Client Sample ID: WP-102115-PA-01

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **1769.9** Analyst: **VAW**
Date Analyzed: 10/26/2015 13:41

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	10 U	0.00057 U

Lab ID: 15101119-02A
Client Sample ID: WP-102115-PA-02

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **1130.9** Analyst: **VAW**
Date Analyzed: 10/26/2015 13:44

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	10 U	0.00088 U

Lab ID: 15101119-03A
Client Sample ID: WP-102115-AA-01

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **1474.3** Analyst: **VAW**
Date Analyzed: 10/26/2015 13:47

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0 U	0.00068 U

Lab ID: 15101119-04A
Client Sample ID: WP-102115-AA-02

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **1459.8** Analyst: **VAW**
Date Analyzed: 10/26/2015 13:51

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0 U	0.00069 U

Note:

12/04/15

ALS Environmental

Date: *27-Oct-15*

Client: Tetra Tech, Inc.
Project: 103X902702002.001F

Work Order: 15101119

Analytical Results

Lab ID: 15101119-05A
Client Sample ID: WP-102115-AA-03

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.	Method: N7300	Air Volume (L): 1512	Analyst: VAW
Date Analyzed: 10/26/2015 13:54			
	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	10 U	<0.00066 U

Lab ID: 15101119-06A
Client Sample ID: WP-102115-AA-04

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.	Method: N7300	Air Volume (L): 1516.8	Analyst: VAW
Date Analyzed: 10/26/2015 13:57			
	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	10 U	<0.00066 U

Lab ID: 15101119-07A
Client Sample ID: WP-102115-AA-05

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.	Method: N7300	Air Volume (L): 1492.8	Analyst: VAW
Date Analyzed: 10/26/2015 14:00			
	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	10 U	<0.00067 U

Lab ID: 15101119-08A
Client Sample ID: WP-102115-AA-06

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.	Method: N7300	Air Volume (L): 1502.4	Analyst: VAW
Date Analyzed: 10/26/2015 14:04			
	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0 U	<0.00067 U

Note:

12/04/15

ALS Environmental

Date: *27-Oct-15*

Client: Tetra Tech, Inc.
Project: 103X902702002.001F

Work Order: 15101119

Analytical Results

Lab ID: 15101119-09A
Client Sample ID: WP-102115-AA-FB01

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.		Method: **N7300**	Air Volume (L): **0**	Analyst: **VAW**
Date Analyzed: 10/26/2015 14:20		Reporting Limit		
	µg/sample	µg/sample	mg/m3	
Arsenic	ND	10 U	NA	

JAW
12/04/15

Note:

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	Wiley Property	**Project No.**	TT-02-002
Data Reviewer (signature and date)	Jessica A. Vickers December 4, 2015	**Laboratory/Report No.**	ALS Environ
Analyses	Arsenic – SW6010B and Dust - NIOSH 0500		
Samples	WP-102015-VC-01, WP-102015-VC-02, WP-102015-VC-03, WP-102015-VC-04, WP-10201 WP-102015-VC-06, WP-102015-VC-07, WP-102015-VC-08, WP-102015-VC-09, and WP-1(		
Field Blanks	WP-102015-VC-FB01		

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the E Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 20(evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Data Re* validation guidance document, as well as the above referenced methods.

OVERALL EVALUATION:

Rejection of data was not required for this data package. No additional qualifications were required for the data set base data can be used as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
Y	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

Total versus dissolved metals results evaluation:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Toxicity equivalents (TEQs) and isomer specificity (dioxins/furans, cBaP, and PCB congeners only):

Within Criteria	Exceedance/Notes
NA	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Estimated detection limit (EDL), estimated maximum possible concentration (EMPC), and target analyte identifi only):

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The a present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is cor to deficiencies in one or more quality control criteria.

Date: *29-Oct-15*

ALS Environmental

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-01
Collection Date: 10/20/2015 12:08 PM

Work Order: 15101120
Lab ID: 15101120-01
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	0 17	0.050	NA

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 13:41			
	µg/sample	Reporting Limit µg/sample	ug/cm2
Arsenic	ND	50 U	0.050 U

12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-02
Collection Date: 10/20/2015 12:20 PM

Work Order: 15101120
Lab ID: 15101120-02
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED		Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015				
	mg/sample	Reporting Limit mg/sample	mg/m3	
Dust	ND	0 050 U	NA	

METALS BY ICP		Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 13:44				
	µg/sample	Reporting Limit µg/sample	ug/cm2	
Arsenic	ND	5.0 U	<0.050 U	

12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-03
Collection Date: 10/20/2015 12:28 PM

Work Order: 15101120
Lab ID: 15101120-03
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015	Reporting Limit		
	mg/sample	mg/sample	mg/m3
Dust	0.70	0.050	NA

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 13:47	Reporting Limit		
	µg/sample	µg/sample	ug/cm2
Arsenic	ND	50 U	<0.050 U

12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-04
Collection Date: 10/20/2015 12:40 PM

Work Order: 15101120
Lab ID: 15101120-04
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	0 89	0.050	NA

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 13:57			
	µg/sample	Reporting Limit µg/sample	ug/cm2
Arsenic	ND	50 U	<0.050 U

gaw
12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-05
Collection Date: 10/20/2015 12:47 PM

Work Order: 15101120
Lab ID: 15101120-05
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015	Reporting Limit		
	mg/sample	mg/sample	mg/m3
Dust	**2.9**	**0.050**	**NA**

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 14:00	Reporting Limit		
	µg/sample	µg/sample	ug/cm2
Arsenic	ND	50 U	<0.050 U

JAW
12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-06
Collection Date: 10/20/2015 12:54 PM

Work Order: 15101120
Lab ID: 15101120-06
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	**19**	**0.050**	**NA**

METALS BY ICP	Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 14:03			
	µg/sample	Reporting Limit µg/sample	**ug/cm2**
Arsenic	ND	50 U	<0.050 U

JAW
12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-07
Collection Date: 10/20/2015 01:07 PM

Work Order: 15101120
Lab ID: 15101120-07
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015	Reporting Limit		
	mg/sample	mg/sample	mg/m3
Dust	0 48	0.050	NA

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 14:06	Reporting Limit		
	µg/sample	µg/sample	ug/cm2
Arsenic	ND	5 0 U	<0 050 U

JAW
12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-08
Collection Date: 10/20/2015 01:19 PM

Work Order: 15101120
Lab ID: 15101120-08
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015	Reporting Limit		
	mg/sample	mg/sample	mg/m3
Dust	3 1	**0.050**	**NA**

METALS BY ICP	Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 14:09	Reporting Limit		
	µg/sample	µg/sample	**ug/cm2**
Arsenic	ND	5.0 U	<0.050 U

Gaw
12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-09
Collection Date: 10/20/2015 01:32 PM

Work Order: 15101120
Lab ID: 15101120-09
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015	Reporting Limit		
	mg/sample	mg/sample	mg/m3
Dust	**16**	**0.050**	**NA**

METALS BY ICP	Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 14:13	Reporting Limit		
	µg/sample	**µg/sample**	**ug/cm2**
Arsenic	ND	50 U	<0.050 U

JAW
12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-10
Collection Date: 10/20/2015 01:41 PM

Work Order: 15101120
Lab ID: 15101120-10
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED		Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015		Reporting Limit		
	mg/sample	mg/sample	mg/m3	
Dust	**57**	**0.050**	**NA**	

METALS BY ICP		Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 14:16		Reporting Limit		
	µg/sample	µg/sample	**ug/cm2**	
Arsenic	ND	5.0 U	0.050 U	

12/04/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-FB01
Collection Date: 10/20/2015

Work Order: 15101120
Lab ID: 15101120-11
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED		Method: **N0500**	Area **0 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015	mg/sample	Reporting Limit mg/sample	mg/m3	
Dust	ND	0 050 U	NA	

METALS BY ICP		Method: **SW6010B**	Area **0 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 14:19	µg/sample	Reporting Limit µg/sample	ug/cm2	
Arsenic	ND	5.0 U	NA	

gaw
12/04/15

Note:

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	Wiley Property	**Project No.**	TT-02-002
Data Reviewer (signature and date)	Jessica A. Vickers December 7, 2015	**Laboratory/Report No.**	ALS Environ
Analyses	Arsenic – SW6010B		
Samples	WP-102115-SD-01, WP-102115-SD-02, WP-102115-SD-03, WP-102115-SD-04, and WP-10		
Field Duplicates	WP-102115-SD-05/WP-102115-SD-05-DUP		

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the E Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 20 evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Data Re* validation guidance document, as well as the above referenced methods.

OVERALL EVALUATION:

Rejection of data was not required for this data package. No additional qualifications were required for the data set base data can be used as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
Y	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

Total versus dissolved metals results evaluation:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Toxicity equivalents (TEQs) and isomer specificity (dioxins/furans, cBaP, and PCB congeners only):

Within Criteria	Exceedance/Notes
NA	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Estimated detection limit (EDL), estimated maximum possible concentration (EMPC), and target analyte identifi only):

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The a present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is cor to deficiencies in one or more quality control criteria.

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-01 (With MS/MSD)
Collection Date: 10/21/2015 03:08 PM

Work Order: 15101122
Lab ID: 15101122-01
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	12			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/29/2015**	Analyst: **VAW**
Arsenic	150		5.4	mg/Kg-dry	1	10/29/2015 11:25 AM

gaw
12/07/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-02
Collection Date: 10/21/2015 03:20 PM

Work Order: 15101122
Lab ID: 15101122-02
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	8.7			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	230		5.0	mg/Kg-dry	1	10/26/2015 04:45 PM

12/07/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-03
Collection Date: 10/21/2015 03:32 PM

Work Order: 15101122
Lab ID: 15101122-03
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**11**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**570**		**5.2**	**mg/Kg-dry**	1	10/26/2015 04:47 PM

12/07/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101122
Sample ID: WP-102115-SD-04
Lab ID: 15101122-04
Collection Date: 10/21/2015 03:40 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**22**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**3,000**		**5.5**	**mg/Kg-dry**	1	10/26/2015 05:03 PM

JAW
12/07/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-05
Collection Date: 10/21/2015 03:52 PM

Work Order: 15101122
Lab ID: 15101122-05
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**19**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**5,200**		**5.9**	**mg/Kg-dry**	1	10/26/2015 05:05 PM

12/07/15

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-05-DUP
Collection Date: 10/21/2015 03:55 PM

Work Order: 15101122
Lab ID: 15101122-06
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**16**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**5,600**		**5.0**	**mg/Kg-dry**	1	10/26/2015 05:08 PM

gaw
12/07/15

Note:

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	Wiley Property	**Project No.**	TT-02-002
Data Reviewer (signature and date)	Jessica A. Vickers December 7, 2015	**Laboratory/Report No.**	ALS Environ
Analyses	Arsenic – SW6010B		
Samples	WP-101515-SB-01 and WP-101515-SB-02		

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the E Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 20 evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Data Re* validation guidance document, as well as the above referenced methods.

OVERALL EVALUATION:

Rejection of data was not required for this data package. No additional qualifications were required for the data set base data can be used as reported by the laboratory.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
NA	

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

Total versus dissolved metals results evaluation:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Toxicity equivalents (TEQs) and isomer specificity (dioxins/furans, cBaP, and PCB congeners only):

Within Criteria	Exceedance/Notes
NA	

Sample dilutions:

Within Criteria	Exceedance/Notes
NA	

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Estimated detection limit (EDL), estimated maximum possible concentration (EMPC), and target analyte identifi only):

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The a present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is cor to deficiencies in one or more quality control criteria.

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-101515-SB-01
Collection Date: 10/15/2015 03:30 PM

Work Order: 15101123
Lab ID: 15101123-01
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	20			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	14,000		6.0	mg/Kg-dry	1	10/26/2015 05:11 PM

gaw
12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-101515-SB-02
Collection Date: 10/15/2015 03:40 PM

Work Order: 15101123
Lab ID: 15101123-02
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	19			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	5,200		6.1	mg/Kg-dry	1	10/26/2015 05:14 PM

gaw
12/07/15

Note:

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	Wiley Property	**Project No.**	TT-02-002
Data Reviewer (signature and date)	Jessica A. Vickers December 7, 2015	**Laboratory/Report No.**	ALS Environ
Analyses	Arsenic – SW6010B		
Samples	WP-102115-SF-01, WP-102115-SF-02, WP-102115-SF-03, WP-102115-SF-04, WP-102115-S WP-102115-SF-06, WP-102115-SF-07, WP-102115-SF-08, WP-102115-SF-09, WP-102115-S WP-102115-SF-11, WP-102115-SF-12, WP-102115-SF-13, WP-102115-SF-14, WP-102115-S WP-102115-SF-16, WP-102115-SF-17, WP-102115-SF-18, and WP-102115-SF-19		
Field Duplicates	WP-102115-SF-02/WP-102115-SF-02-DUP		

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the Er Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 20(evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Inorganic Superfund Data Rev* validation guidance document, as well as the above referenced methods.

OVERALL EVALUATION:

Rejection of data was not required for this data package. Results were qualified due to exceedances for matrix spike/ma data can be used with the qualifications indicated in this checklist.

Data completeness:

Within Criteria	Exceedance/Notes
Y	

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
Y	

Field blanks:

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
NA	

MS/MSD:

Within Criteria	Exceedance/Notes
N	WP-102115-SF-11: high MSD %R for arsenic – flag "J+"

Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Serial dilutions:

Within Criteria	Exceedance/Notes
NA	

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	

Field duplicates:

Within Criteria	Exceedance/Notes
Y	

Total versus dissolved metals results evaluation:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Toxicity equivalents (TEQs) and isomer specificity (dioxins/furans, cBaP, and PCB congeners only):

Within Criteria	Exceedance/Notes
NA	

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	10x: WP-102115-SF-03

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

Estimated detection limit (EDL), estimated maximum possible concentration (EMPC), and target analyte identifi only):

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	

TETRA TECH

DATA VALIDATION CHECKLIST – STAGE 2A

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the s low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The a present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is cor to deficiencies in one or more quality control criteria.

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-01
Collection Date: 10/21/2015 02:40 PM

Work Order: 15101124
Lab ID: 15101124-01
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	15			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	76		5.7	mg/Kg-dry	1	10/26/2015 03:52 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-02
Lab ID: 15101124-02
Collection Date: 10/21/2015 05:09 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	28			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	7,200		6.4	mg/Kg-dry	1	10/26/2015 03:55 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-02-DUP
Lab ID: 15101124-03
Collection Date: 10/21/2015 05:12 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	28			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	6,000		6.2	mg/Kg-dry	1	10/26/2015 03:58 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-03
Collection Date: 10/21/2015 05:15 PM

Work Order: 15101124
Lab ID: 15101124-04
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	28			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	31,000		64	mg/Kg-dry	10	10/26/2015 04:24 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-04
Collection Date: 10/21/2015 05:18 PM

Work Order: 15101124
Lab ID: 15101124-05
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	21			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	2,700		5.7	mg/Kg-dry	1	10/26/2015 04:04 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-05
Collection Date: 10/21/2015 05:22 PM

Work Order: 15101124
Lab ID: 15101124-06
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**11**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**1,400**		**5.3**	**mg/Kg-dry**	1	10/26/2015 04:07 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-06
Collection Date: 10/21/2015 05:25 PM

Work Order: 15101124
Lab ID: 15101124-07
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**7.8**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**93**		**5.3**	**mg/Kg-dry**	1	10/26/2015 04:09 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-07
Collection Date: 10/21/2015 05:27 PM

Work Order: 15101124
Lab ID: 15101124-08
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	19			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	960		6.2	mg/Kg-dry	1	10/26/2015 04:12 PM

QCW
12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-08
Collection Date: 10/21/2015 05:30 PM

Work Order: 15101124
Lab ID: 15101124-09
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	12			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	67		5.3	mg/Kg-dry	1	10/26/2015 04:21 PM

gaw
12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-09
Lab ID: 15101124-10
Collection Date: 10/21/2015 05:33 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**32**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**1,500**		**6.9**	**mg/Kg-dry**	1	10/26/2015 05:17 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-10
Lab ID: 15101124-11
Collection Date: 10/21/2015 05:39 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**7.6**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**1,400**		**4.7**	**mg/Kg-dry**	1	10/26/2015 05:20 PM

QAW
12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-11 (With MS/MSD)
Lab ID: 15101124-12
Collection Date: 10/21/2015 05:51 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	12			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/28/2015**	Analyst: **VAW**
Arsenic	140	J+	5.0	mg/Kg-dry	1	10/28/2015 11:29 AM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-12
Lab ID: 15101124-13
Collection Date: 10/21/2015 05:54 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**15**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**910**		**5.7**	**mg/Kg-dry**	1	10/26/2015 05:22 PM

gaw
12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-13
Collection Date: 10/21/2015 05:58 PM

Work Order: 15101124
Lab ID: 15101124-14
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**18**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**63**		**5.6**	**mg/Kg-dry**	1	10/26/2015 05:25 PM

gaw
12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-14
Collection Date: 10/21/2015 06:01 PM

Work Order: 15101124
Lab ID: 15101124-15
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	15			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	300		5.5	mg/Kg-dry	1	10/26/2015 05:28 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-15
Collection Date: 10/21/2015 06:04 PM

Work Order: 15101124
Lab ID: 15101124-16
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	21			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	4,700		6.3	mg/Kg-dry	1	10/26/2015 05:37 PM

12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-16
Collection Date: 10/21/2015 06:06 PM

Work Order: 15101124
Lab ID: 15101124-17
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	20			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	2,300		6.0	mg/Kg-dry	1	10/26/2015 05:40 PM

gaw
12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-17
Collection Date: 10/21/2015 06:09 PM

Work Order: 15101124
Lab ID: 15101124-18
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	18			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	2,000		6.1	mg/Kg-dry	1	10/26/2015 05:43 PM

gaw
12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-18
Collection Date: 10/21/2015 06:18 PM

Work Order: 15101124
Lab ID: 15101124-19
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	12			% of sample	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	210		5.0	mg/Kg-dry	1	10/26/2015 05:45 PM

gaw
12/07/15

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-19
Lab ID: 15101124-20
Collection Date: 10/21/2015 06:22 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**18**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**68**		**5.7**	**mg/Kg-dry**	1	10/26/2015 05:48 PM

12/07/15

Note:

ATTACHMENT 1

LABORATORY DATA PACKAGES

(360 Pages)

ALS Environmental

03-Apr-2015

Jessica Vickers
Tetra Tech, Inc.
1955 Evergreen Pkwy
Ste. 300 Bldg. 200
Duluth, GA 30096

Tel: (678) 755-3104
Fax:

Re: Wiley Property

Work Order: **1503827**

Dear Jessica,

ALS Environmental received 3 samples on 27-Mar-2015 10:54 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 7.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 03-Apr-15

Client: Tetra Tech, Inc.
Project: Wiley Property
Work Order: **1503827**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1503827-01	WP-032415-AA-01	Air		3/24/2015 13:25	3/27/2015 10:54	☐
1503827-02	WP-032415-AA-02	Air		3/24/2015 13:25	3/27/2015 10:54	☐
1503827-03	WP-032415-AA-FB	Air		3/24/2015 13:25	3/27/2015 10:54	☐

Client: Tetra Tech, Inc.
Project: Wiley Property
Work Order: 1503827

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: *03-Apr-15*

Client: Tetra Tech, Inc.
Project: Wiley Property

Work Order: 1503827

Analytical Results

Lab ID: 1503827-01A
Client Sample ID: WP-032415-AA-01

Collection Date: 3/24/2015 1:25:00 PM
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.		Method: **N7300**	Air Volume (L): **304.73**	Analyst: **VAW**
Date Analyzed: 3/31/2015 12:00				
	µg/sample	Reporting Limit µg/sample	mg/m3	
Arsenic	ND	1.0	<0.0033	

Lab ID: 1503827-02A
Client Sample ID: WP-032415-AA-02

Collection Date: 3/24/2015 1:25:00 PM
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.		Method: **N7300**	Air Volume (L): **300.47**	Analyst: **VAW**
Date Analyzed: 3/31/2015 12:03				
	µg/sample	Reporting Limit µg/sample	mg/m3	
Arsenic	ND	1.0	<0.0033	

Lab ID: 1503827-03A
Client Sample ID: WP-032415-AA-FB

Collection Date: 3/24/2015 1:25:00 PM
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.		Method: **N7300**	Air Volume (L): **0**	Analyst: **VAW**
Date Analyzed: 3/31/2015 12:06				
	µg/sample	Reporting Limit µg/sample	mg/m3	
Arsenic	ND	1.0	NA	

Note:

Date: 03-Apr-15

ALS Environmental

QC BATCH REPORT

Client: Tetra Tech, Inc.
Work Order: 1503827
Project: Wiley Property

Batch ID: **27529** Instrument ID: **ICP3** Method: **N7300**

MBLK Sample ID: **mblk-27529-27529** Units: **µg/sample** Analysis Date: **3/31/2015 11:51 AM**
Client ID: Run ID: **ICP3_150331B** SeqNo: **1026579** Prep Date: **3/30/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	1.0								

LCS Sample ID: **lcs-27529-27529** Units: **µg/sample** Analysis Date: **3/31/2015 11:55 AM**
Client ID: Run ID: **ICP3_150331B** SeqNo: **1026580** Prep Date: **3/30/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	20.01	1.0	20	0	100	80-120	0			

LCSD Sample ID: **lcsd-27529-27529** Units: **µg/sample** Analysis Date: **3/31/2015 11:57 AM**
Client ID: Run ID: **ICP3_150331B** SeqNo: **1026581** Prep Date: **3/30/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	19.72	1.0	20	0	98.6	80-120	20.01	1.43	20	

The following samples were analyzed in this batch: 1503827-01a 1503827-02a 1503827-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 03-Apr-15

Client: Tetra Tech, Inc.
Project: Wiley Property
WorkOrder: **1503827**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
µg/sample	

ALS Environmental

Sample Receipt Checklist

Client Name: **TETRATECH-DULUTH** Date/Time Received: **27-Mar-15 10:54**

Work Order: **1503827** Received by: **SNH**

Checklist completed by: Shiloh Greenwald (eSignature) 27-Mar-15 (Date) Reviewed by: Shawn Smythe (eSignature) 31-Mar-15 (Date)

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on 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?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):			
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

April 23, 2015

Analytical Report for Service Request No: K1503521

Ms. Jessica Vickers
Tetra Tech EM, Incorporated
1955 Evergreen Blvd, Bldg 200, Suite 300
Duluth, GA 30096

RE: Wiley Property

Dear Ms.Vickers,

Enclosed are the results of the sample(s) submitted to our laboratory April 06, 2015
For your reference, these analyses have been assigned our service request number **K1503521.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at gregory.salata@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Gregory Salata

Gregory Salata, Ph.D.
Client Services
Manager

ALS Environmental
ALS Group USA, Corp.
1317 South 13th Avenue
Kelso, WA 98626
T: +1 360 577 7222
F: +1 360 636 1068
www.alsglobal.com

Table of Contents

Acronyms

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General Chemistry Parameters

Total Metals

Raw Data

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
ISO 17025	http://www.pjlabs.com/	L14-50
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

ALS Environmental

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	Tetra Tech EM, Incorporated	**Service Request No.:**	K1503521
Project:	Wiley Property	**Date Received:**	04/06/15
Sample Matrix:	Soil		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

One soil sample was received for analysis at ALS Environmental on 04/06/15. The sample was received in good condition and consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of this sample were observed.

Total Metals

Matrix Spike Recovery Exceptions:
The matrix spike recovery of Aluminum for sample WP-032415-W was outside the ALS control criteria as a result of the heterogeneous character of the sample. The Relative Percent Difference (RPD) for the replicate analysis supported this. Since the unspiked samples contained high analyte concentrations relative to the amount spiked, the variability between replicates was sufficient to bias the percent recovery outside normal ALS control criteria. The associated QA/QC results (e.g. control sample, calibration standards, etc.) indicated the analysis was in control. No further corrective action was appropriate.

The control criteria for matrix spike recovery of Antimony, Arsenic, and Iron for sample WP-032415-W were not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

Relative Percent Difference Exceptions:
The Relative Percent Difference (RPD) for the replicate analysis of Aluminum and Iron in sample WP-032415-W was outside the normal ALS control limits. The variability in the results was attributed to the heterogeneous character of the sample. Standard mixing techniques were used, but were not sufficient for complete homogenization of this sample.

No other anomalies associated with the analysis of this sample were observed.

Approved by Gregory Salata

ALS Environmental

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

ALS Environmental

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541

Chain of Custody Form

Page ____ of ____

COC ID: 24659

Customer Information	Project Information	Parameter/
	Wiley Property	TAL Metals + Hg
		Chloride
Tetra Tech EM Inc.	Tetra Tech EM Inc.	Moisture
Jessica Vickers	Accounts Payable	
1 South Wacker Dr	1 South Wacker Dr	
Suite 3700	Suite 3700	
Chicago, IL 60606	Chicago, IL 60606	
(312) 201-7411	(312) 201-7411	
(312) 938-0118	(312) 938-0118	
jessica.vickers@tetratech.com		

WP-032415-W	3/24/15	1300	Waste	None	2	X	X	X	

Shipment Method: Fedex

Relinquished by:	Date: 3/26/15	Time: 1400	Received by:	Notes:
Relinquished by:	Date: 4/6/15	Time: 0900	Received by (Laboratory):	

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS

PC 6125

Cooler Receipt and Preservation Form

Client Tetra Tech Service Request K15 03521

Received: 4/6/15 Opened: 4/6/15 By: Unloaded: 4/6/15 By:

. Samples were received via? *Mail* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*

. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*

. Were custody seals on coolers? NA Y N If yes, how many and where? _____

If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp.	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
NM	—	—	—	—	—	24659	8070 7021 0043	
NM	—	—	—	—	—		" " 0010	

. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* paint cans, pads

. Were custody papers properly filled out (ink, signed, etc.)? NA Y N

. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N

. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N

. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N

. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N

0. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N

1. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N

2. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

ALS Environmental

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

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Analytical Report

Client:	Tetra Tech EM, Incorporated	**Service Request:**	K1503521
Project:	Wiley Property	**Date Collected:**	03/24/15
Sample Matrix:	Soil	**Date Received:**	04/6/15
Analysis Method:	160.3 Modified	**Units:**	Percent
Prep Method:	None	**Basis:**	As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
WP-032415-W	K1503521-001	**79.7**	-	-	1	04/08/15 13:20	

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QA/QC Report

Client:	Tetra Tech EM, Incorporated	**Service Request:**	K1503521
Project	Wiley Property	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Analysis Method:	160.3 Modified	**Units:**	Percent
Prep Method:	None	**Basis:**	As Received

Replicate Sample Summary
Solids, Total

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
Batch QC	K1503191-001DUP	-	-	43.1	42.8	43.0	<1	20	04/08/15
Batch QC	K1503328-001DUP	-	-	85.2	84.4	84.8	<1	20	04/08/15
Batch QC	K1503452-001DUP	-	-	97.0	96.9	97.0	<1	20	04/08/15

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Analytical Report

Client:	Tetra Tech EM, Incorporated	**Service Request:**	K1503521
Project:	Wiley Property	**Date Collected:**	03/24/15
Sample Matrix:	Soil	**Date Received:**	04/6/15
Analysis Method:	300.0	**Units:**	mg/Kg
Prep Method:	Method	**Basis:**	Dry

Chloride

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
WP-032415-W	K1503521-001	ND U	5.0	-	2	04/20/15 15:42	4/20/15	
Method Blank	K1503521-MB	ND U	2.0	-	1	04/20/15 12:08	4/20/15	

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QA/QC Report

Client:	Tetra Tech EM, Incorporated	**Service Request:**	K1503521
Project	Wiley Property	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
		Date Analyzed:	04/20/15

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	Batch QC	**Units:**	mg/Kg
Lab Code:	KQ1503869-03	**Basis:**	Dry

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ1503869-03DUP Result	Average	RPD	RPD Limit
Chloride	300.0	220	-	3790	3810	3800	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	Tetra Tech EM, Incorporated	**Service Request:**	K1503521
Project:	Wiley Property	**Date Collected:**	N/A
Sample Matrix:	Soil	**Date Received:**	N/A
		Date Analyzed:	04/20/15
		Date Extracted:	04/20/15

Duplicate Matrix Spike Summary
Chloride

Sample Name:	Batch QC	**Units:**	mg/Kg
Lab Code:	KQ1503869-03	**Basis:**	Dry
Analysis Method:	300.0		
Prep Method:	Method		

		Matrix Spike KQ1503869-03MS			Duplicate Matrix Spike KQ1503869-03DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Chloride	3790	8270	4220	106	8340	4220	108	75-125	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	Tetra Tech EM, Incorporated	**Service Request:**	K1503521
Project:	Wiley Property	**Date Analyzed:**	04/20/15
Sample Matrix:	Soil	**Date Extracted:**	04/20/15

Lab Control Sample Summary
Chloride

Analysis Method:	300.0	**Units:**	mg/Kg
Prep Method:	Method	**Basis:**	Dry
		Analysis Lot:	441229

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1503521-LCS	366	374	98	85-115

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QA/QC Report

Client: Tetra Tech EM, Incorporated
Project: Wiley Property

Service Request: K1503521

Continuing Calibration Verification (CCV) Summary

Chloride

Analysis Method: 300.0

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	441229	KQ1503876-01	04/20/15 11:08	5.00	5.08	102	90-110
CCV2	441229	KQ1503876-02	04/20/15 14:52	5.00	5.04	101	90-110
CCV3	441229	KQ1503876-03	04/20/15 16:11	5.00	5.07	101	90-110

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QA/QC Report

Client: Tetra Tech EM, Incorporated
Project: Wiley Property

Service Request:K1503521

Continuing Calibration Blank (CCB) Summary
Chloride

Analysis Method: 300.0

Units:mg/Kg

	Analysis Lot	Lab Code	Date Analyzed	MRL	MDL	Result	Q
CCB1	441229	KQ1503876-04	04/20/15 11:18	2.0		ND	U
CCB2	441229	KQ1503876-05	04/20/15 15:02	2.0		ND	U
CCB3	441229	KQ1503876-06	04/20/15 16:21	2.0		ND	U

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INORGANIC ANALYSIS DATA PACKAGE

Client: Tetra Tech EM, Incorporated
Project No.: NA
Project Name: Wiley Property
Matrix: SOIL

Service Request: K1503521
Date Collected: 03/24/15
Date Received: 04/06/15
Units: mg/Kg
Basis: DRY

Sample Name: WP-032415-W
Lab Code: K1503521-001

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Aluminum	6010C	2.9	0.4	2.0	04/09/15	04/14/15	792		N*
Antimony	6020A	0.713	0.143	100.0	04/09/15	04/17/15	816		
Arsenic	6010C	713	143	500.0	04/09/15	04/14/15	747000		
Barium	6020A	0.71	0.29	100.0	04/09/15	04/17/15	3.32		
Beryllium	6020A	0.285	0.071	100.0	04/09/15	04/17/15	0.071	U	
Cadmium	6020A	0.285	0.100	100.0	04/09/15	04/17/15	0.100	U	
Calcium	6010C	2.9	0.6	2.0	04/09/15	04/14/15	3.1		
Chromium	6020A	2.85	0.86	100.0	04/09/15	04/17/15	0.86	U	
Cobalt	6020A	0.285	0.086	100.0	04/09/15	04/17/15	0.135	J	
Copper	6020A	1.43	0.57	100.0	04/09/15	04/17/15	0.96	J	
Iron	6010C	2.9	1.4	2.0	04/09/15	04/14/15	1550		*
Lead	6020A	0.71	0.29	100.0	04/09/15	04/17/15	1.30		
Magnesium	6010C	1.43	0.14	2.0	04/09/15	04/14/15	7.60		
Manganese	6020A	0.71	0.29	100.0	04/09/15	04/17/15	4.55		
Mercury	7471B	0.115	0.012	5.0	04/09/15	04/09/15	1.33		
Nickel	6020A	2.85	0.43	100.0	04/09/15	04/17/15	0.43	U	
Potassium	6010C	28.5	6.4	2.0	04/09/15	04/14/15	35.7		
Selenium	6020A	14.3	1.00	100.0	04/09/15	04/17/15	1.46	J	
Silver	6020A	0.285	0.057	100.0	04/09/15	04/17/15	0.057	U	
Sodium	6010C	28.5	2.9	2.0	04/09/15	04/14/15	2.9	U	
Thallium	6020A	0.285	0.029	100.0	04/09/15	04/17/15	0.029	U	
Vanadium	6020A	2.85	0.29	100.0	04/09/15	04/17/15	1.68	J	
Zinc	6020A	14.3	2.9	100.0	04/09/15	04/17/15	8.8	J	

% Solids: 79.7

Comments:

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INORGANIC ANALYSIS DATA PACKAGE

Client: Tetra Tech EM, Incorporated
Project No.: NA
Project Name: Wiley Property
Matrix: SOIL

Service Request: K1503521
Date Collected:
Date Received:
Units: mg/Kg
Basis: DRY

Sample Name: Method Blank
Lab Code: KQ1503409-02

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Aluminum	6010C	4.0	0.5	2.0	04/09/15	04/14/15	0.5	U	
Antimony	6020A	0.050	0.010	5.0	04/09/15	04/17/15	0.010	U	
Arsenic	6010C	4.0	0.8	2.0	04/09/15	04/14/15	7.4		
Barium	6020A	0.05	0.02	5.0	04/09/15	04/17/15	0.02	U	
Beryllium	6020A	0.020	0.005	5.0	04/09/15	04/17/15	0.005	U	
Cadmium	6020A	0.020	0.007	5.0	04/09/15	04/17/15	0.007	U	
Calcium	6010C	4.0	0.9	2.0	04/09/15	04/14/15	1.1	J	
Chromium	6020A	0.20	0.06	5.0	04/09/15	04/17/15	0.06	U	
Cobalt	6020A	0.020	0.006	5.0	04/09/15	04/17/15	0.006	U	
Copper	6020A	0.10	0.04	5.0	04/09/15	04/17/15	0.04	U	
Iron	6010C	4.0	2.0	2.0	04/09/15	04/14/15	2.0	U	*
Lead	6020A	0.05	0.02	5.0	04/09/15	04/17/15	0.02	U	
Magnesium	6010C	2.00	0.20	2.0	04/09/15	04/14/15	0.20	U	
Manganese	6020A	0.05	0.02	5.0	04/09/15	04/17/15	0.02	U	
Nickel	6020A	0.20	0.03	5.0	04/09/15	04/17/15	0.03	U	
Potassium	6010C	40.0	9.0	2.0	04/09/15	04/14/15	13.1	J	
Selenium	6020A	1.00	0.07	5.0	04/09/15	04/17/15	0.07	U	
Silver	6020A	0.020	0.004	5.0	04/09/15	04/17/15	0.004	U	
Sodium	6010C	40.0	4.0	2.0	04/09/15	04/14/15	4.0	U	
Thallium	6020A	0.020	0.002	5.0	04/09/15	04/17/15	0.002	J	
Vanadium	6020A	0.20	0.02	5.0	04/09/15	04/17/15	0.02	U	
Zinc	6020A	1.0	0.2	5.0	04/09/15	04/17/15	0.2	U	

% Solids: 0.0

Comments:

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INORGANIC ANALYSIS DATA PACKAGE

Client: Tetra Tech EM, Incorporated
Project No.: NA
Project Name: Wiley Property
Matrix: SOIL

Service Request: K1503521
Date Collected:
Date Received:
Units: mg/Kg
Basis: DRY

Sample Name: Method Blank
Lab Code: KQ1503430-03

Analyte	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Mercury	7471B	0.020	0.002	1.0	04/09/15	04/09/15	0.002	U	

% Solids: 100.0

Comments:

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICV Source: Inorganic Ventures **CCV Source:** ALS MIXED

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					Method
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum	1000	984	98	250	252	101	251	100	6010C
Aluminum	5000	5040	101	10000	10140	101	10340	103	6010C
Antimony	25.0	25.5	102	25.0	25.3	101	25.6	102	6020A
Arsenic	2500	2524	101	1000	1002	100	1027	103	6010C
Barium	100.0	106.0	106	25.0	25.4	102	24.9	100	6020A
Beryllium	2.5	2.6	104	25.0	25.0	100	24.5	98	6020A
Cadmium	12.5	13.4	107	25.0	25.1	100	25.2	101	6020A
Calcium	5000	4872	97	500	500	100	508	102	6010C
Calcium	12500	12480	100	10000	9954	100	10020	100	6010C
Chromium	10.0	10.5	105	25.0	24.6	98	25.0	100	6020A
Cobalt	25.0	25.8	103	25.0	24.4	98	24.7	99	6020A
Copper	12.5	12.9	103	25.0	24.6	98	25.0	100	6020A
Iron	2500	2497	100	10000	10050	100	10090	101	6010C
Lead	25.0	26.6	106	25.0	25.5	102	25.7	103	6020A
Magnesium	5000	4956	99	250	252	101	258	103	6010C
Magnesium	12500	12560	100	10000	10130	101	10350	104	6010C
Manganese	25.0	25.9	104	25.0	24.5	98	25.0	100	6020A
Mercury	5.00	4.98	100	5.00	5.08	102	5.09	102	7471B
Nickel	25.0	26.0	104	25.0	24.8	99	25.0	100	6020A
Potassium	12500	12600	101	10000	10170	102	10200	102	6010C
Selenium	25.0	25.9	104	25.0	24.5	98	24.0	96	6020A
Silver	12.5	13.2	106	25.0	25.0	100	25.4	102	6020A
Sodium	12500	12540	100	10000	10120	101	10300	103	6010C
Thallium	25.0	26.0	104	25.0	25.3	101	25.1	100	6020A
Vanadium	25.0	25.4	102	25.0	24.4	98	24.7	99	6020A
Zinc	25.0	25.6	102	25.0	24.7	99	25.3	101	6020A

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICV Source: Inorganic Ventures **CCV Source:** ALS MIXED

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					Method
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum				10000	10720	107	10530	105	6010C
Aluminum				250	253	101	254	102	6010C
Antimony				25.0	25.7	103	26.1	104	6020A
Arsenic				1000	1036	104	1019	102	6010C
Barium				25.0	25.6	102	25.4	102	6020A
Beryllium				25.0	24.0	96	24.6	98	6020A
Cadmium				25.0	25.5	102	25.5	102	6020A
Calcium				10000	9882	99	9964	100	6010C
Calcium				500	496	99	503	101	6010C
Chromium				25.0	24.9	100	25.0	100	6020A
Cobalt				25.0	24.7	99	24.9	100	6020A
Copper				25.0	24.9	100	25.1	100	6020A
Iron				10000	10050	100	10080	101	6010C
Lead				25.0	25.4	102	25.4	102	6020A
Magnesium				10000	10030	100	10220	102	6010C
Magnesium				250	253	101	254	102	6010C
Manganese				25.0	24.8	99	24.5	98	6020A
Mercury				5.00	5.09	102	5.22	104	7471B
Nickel				25.0	25.0	100	25.2	101	6020A
Potassium				10000	10040	100	10210	102	6010C
Selenium				25.0	24.4	98	24.8	99	6020A
Silver				25.0	25.5	102	25.8	103	6020A
Sodium				10000	9978	100	10120	101	6010C
Thallium				25.0	25.2	101	25.0	100	6020A
Vanadium				25.0	24.5	98	24.7	99	6020A
Zinc				25.0	24.5	98	24.6	98	6020A

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LOW LEVEL INITIAL CALIBRATION AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Client: Tetra Tech EM, Incorporated **SDG No.:** K1503521

Contract: **Lab Code:** ALSK **Case No.:** **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: ALS MIXED

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
LLICV1									
	Aluminum	10.8	10.0	108	70.0 - 130.0	P	04/14/15	09:19	041415AICP
	Arsenic	8.2	10.0	82	70.0 - 130.0	P	04/14/15	09:19	041415AICP
	Calcium	22.3	20.0	112	70.0 - 130.0	P	04/14/15	09:19	041415AICP
	Magnesium	5.1	5.0	102	70.0 - 130.0	P	04/14/15	09:19	041415AICP
	Potassium	237.0	200.0	118	70.0 - 130.0	P	04/14/15	09:19	041415AICP
	Sodium	213.1	200.0	107	70.0 - 130.0	P	04/14/15	09:19	041415AICP
LLICV									
	Iron	24.5	20.0	122	70.0 - 130.0	P	04/14/15	09:31	041415AICP
LLCCV1									
	Aluminum	10.6	10.0	106	70.0 - 130.0	P	04/14/15	12:00	041415AICP
	Calcium	21.4	20.0	107	70.0 - 130.0	P	04/14/15	12:00	041415AICP
	Iron	19.3	20.0	96	70.0 - 130.0	P	04/14/15	12:00	041415AICP
	Magnesium	5.1	5.0	102	70.0 - 130.0	P	04/14/15	12:00	041415AICP
	Sodium	216.5	200.0	108	70.0 - 130.0	P	04/14/15	12:00	041415AICP
LLCCV1									
	Arsenic	12.5	10.0	125	70.0 - 130.0	P	04/14/15	12:05	041415AICP
	Potassium	204.9	200.0	102	70.0 - 130.0	P	04/14/15	12:05	041415AICP

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LOW LEVEL INITIAL CALIBRATION AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Client: Tetra Tech EM, Incorporated **SDG No.:** K1503521

Contract: **Lab Code:** ALSK **Case No.:** **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: ALS MIXED

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
LLICVS1									
	Antimony	0.108	0.10	108	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Barium	0.104	0.10	104	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Beryllium	0.036	0.04	90	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Cadmium	0.036	0.04	90	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Chromium	0.37	0.4	92	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Cobalt	0.039	0.04	98	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Copper	0.17	0.2	85	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Lead	0.096	0.10	96	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Manganese	0.093	0.10	93	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Nickel	0.35	0.4	88	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Selenium	1.92	2.0	96	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Silver	0.041	0.04	102	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Thallium	0.042	0.04	105	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Vanadium	0.36	0.4	90	70.0 - 130.0	MS	04/17/15	10:28	041715A
	Zinc	0.86	1.0	86	70.0 - 130.0	MS	04/17/15	10:28	041715A
LLCCVS2									
	Antimony	0.079	0.10	79	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Barium	0.093	0.10	93	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Beryllium	0.035	0.04	88	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Cadmium	0.039	0.04	98	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Chromium	0.39	0.4	98	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Cobalt	0.036	0.04	90	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Copper	0.16	0.2	80	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Lead	0.094	0.10	94	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Manganese	0.089	0.10	89	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Nickel	0.33	0.4	82	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Selenium	1.83	2.0	92	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Silver	0.037	0.04	92	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Thallium	0.042	0.04	105	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Vanadium	0.37	0.4	92	70.0 - 130.0	MS	04/17/15	11:12	041715A
	Zinc	0.82	1.0	82	70.0 - 130.0	MS	04/17/15	11:12	041715A

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Metals

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LOW LEVEL INITIAL CALIBRATION AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Client: Tetra Tech EM, Incorporated **SDG No.:** K1503521

Contract: **Lab Code:** ALSK **Case No.:** **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: ALS MIXED

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
LLCCVS2									
	Antimony	0.082	0.10	82	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Barium	0.100	0.10	100	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Beryllium	0.034	0.04	85	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Cadmium	0.041	0.04	102	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Chromium	0.37	0.4	92	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Cobalt	0.036	0.04	90	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Copper	0.15	0.2	75	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Lead	0.091	0.10	91	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Manganese	0.090	0.10	90	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Nickel	0.30	0.4	75	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Selenium	1.86	2.0	93	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Silver	0.040	0.04	100	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Thallium	0.044	0.04	110	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Vanadium	0.38	0.4	95	70.0 - 130.0	MS	04/17/15	12:00	041715A
	Zinc	0.70	1.0	70	70.0 - 130.0	MS	04/17/15	12:00	041715A
LLCCVS3									
	Antimony	0.098	0.10	98	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Barium	0.100	0.10	100	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Beryllium	0.032	0.04	80	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Cadmium	0.038	0.04	95	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Chromium	0.41	0.4	102	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Cobalt	0.033	0.04	82	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Copper	0.14	0.2	70	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Lead	0.090	0.10	90	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Manganese	0.100	0.10	100	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Nickel	0.30	0.4	75	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Selenium	1.77	2.0	88	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Silver	0.044	0.04	110	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Thallium	0.041	0.04	102	70.0 - 130.0	MS	04/17/15	12:59	041715A
	Vanadium	0.38	0.4	95	70.0 - 130.0	MS	04/17/15	12:59	041715A
LLCCVS3									
	Zinc	1.54	2.0	77	70.0 - 130.0	MS	04/17/15	13:10	041715A

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Metals

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CRDL STANDARD FOR AA AND ICP

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Mercury				0.20	0.191	96		

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Metals

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BLANKS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Method
Aluminum	2.5	U	2.5	U	2.5	U	2.5	U	6010C
Antimony	0.020	U	0.020	U	0.020	U	0.020	U	6020A
Arsenic	4.0	U	4.0	U	4.0	U	10.3	J	6010C
Barium	0.04	U	0.04	U	0.04	U	0.04	U	6020A
Beryllium	0.010	U	0.010	U	0.010	U	0.010	U	6020A
Cadmium	0.014	U	0.014	U	0.014	U	0.014	U	6020A
Calcium	4.5	U	4.5	U	4.5	U	4.5	U	6010C
Chromium	0.12	U	0.12	U	0.12	U	0.12	U	6020A
Cobalt	0.012	U	0.012	U	0.012	U	0.012	U	6020A
Copper	0.08	U	0.08	U	0.08	U	0.08	U	6020A
Iron	10.0	U	10.0	U	10.0	U	10.0	U	6010C
Lead	0.04	U	0.04	U	0.04	U	0.04	U	6020A
Magnesium	1.00	U	1.00	U	1.00	U	1.00	U	6010C
Manganese	0.04	U	0.04	U	0.04	J	0.04	U	6020A
Mercury	0.020	U	0.020	U	0.020	U	0.020	U	7471B
Nickel	0.06	U	0.06	U	-0.06	J	-0.07	J	6020A
Potassium	45	U	83	J	45	U	45	U	6010C
Selenium	0.14	U	0.14	U	0.14	U	0.14	U	6020A
Silver	0.008	U	0.008	U	0.008	U	0.008	U	6020A
Sodium	20.0	U	20.0	U	20.0	U	20.0	U	6010C
Thallium	0.034	J	0.010	J	0.030	J	0.014	J	6020A
Vanadium	0.04	U	0.04	U	0.04	U	0.04	U	6020A
Zinc	0.4	U	0.4	U	0.4	U	0.4	U	6020A

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Metals

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BLANKS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Method
Aluminum			2.5	U					6010C
Antimony			0.020	U					6020A
Arsenic			4.3	J					6010C
Barium			0.04	U					6020A
Beryllium			0.010	U					6020A
Cadmium			0.014	U					6020A
Calcium			4.5	U					6010C
Chromium			0.12	U					6020A
Cobalt			0.012	U					6020A
Copper			0.08	U					6020A
Iron			10.0	U					6010C
Lead			0.04	U					6020A
Magnesium			1.00	U					6010C
Manganese			0.04	U					6020A
Mercury			0.020	U					7471B
Nickel			-0.09	J					6020A
Potassium			45	U					6010C
Selenium			0.14	U					6020A
Silver			0.008	U					6020A
Sodium			20.0	U					6010C
Thallium			0.025	J					6020A
Vanadium			0.04	U					6020A
Zinc			0.4	U					6020A

Metals

ICP INTERFERENCE CHECK SAMPLE

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: Agilent ICPMS **ICS Source:** Inorganic Ventures

Concentration Units): ug/L

Analyte	True Sol.A	True Sol.AB	Initial Found Sol.A	Initial Found Sol.AB	Initial Found %R	Final Found Sol.A	Final Found Sol.AB	Final Found %R
Antimony	0.0		0.2	0.3				
Barium	0.0		0.2	0.2				
Beryllium	0.0		0.0	0.0				
Cadmium	0.0	25.0	0.1	25.3	101			
Chromium	0.0	50.0	0.2	50.5	101			
Cobalt	0.0	50.0	0.2	48.1	96			
Copper	0.0	50.0	0.4	47.0	94			
Lead	0.0		0.1	0.1				
Manganese	0.0	50.0	1.4	51.3	103			
Nickel	0.0	50.0	0.3	48.0	96			
Selenium	0.0	25.0	0.0	24.1	96			
Silver	0.0	12.5	0.0	12.6	101			
Thallium	0.0		0.0	0.0				
Vanadium	0.0	50.0	0.0	50.3	101			
Zinc	0.0	25.0	1.4	24.5	98			

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ICP INTERFERENCE CHECK SAMPLE

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03 **ICS Source:** Inorganic Ventures

Concentration Units): ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Aluminum	500000	500000	425500	424600	85			
Arsenic			3	-2				
Calcium	500000	500000	471000	472400	94			
Iron	200000	200000	186900	187400	94			
Magnesium	500000	500000	401700	396300	79			
Potassium			-30	-21				
Sodium			1	4				

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SPIKE SAMPLE RECOVERY

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA **Units:** MG/KG

Project Name: Wiley Property **Basis:** DRY

Matrix: SOIL **% Solids:** 79.7

Sample Name: WP-032415-WS **Lab Code:** K1503521-001S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Aluminum	75 - 125	1160		792		284.00	129.6	N	6010C
Antimony		939.088		816.356		70.9	173.1		6020A
Arsenic		769000		747000		70.89	31034.0		6010C
Barium	75 - 125	156.13		3.32		141.8	107.8		6020A
Beryllium	75 - 125	7.352		0.071	U	7.1	103.5		6020A
Cadmium	75 - 125	7.988		0.100	U	7.1	112.5		6020A
Calcium	75 - 125	728		3.1		709.00	102.2		6010C
Chromium	75 - 125	30.28		0.86	U	28.4	106.6		6020A
Cobalt	75 - 125	74.660		0.135	J	70.9	105.1		6020A
Copper	75 - 125	38.81		0.96	J	35.4	106.9		6020A
Iron		1940		1550		142.00	274.6		6010C
Lead	75 - 125	79.79		1.30		70.9	110.7		6020A
Magnesium	75 - 125	720		7.60		709.00	100.5		6010C
Manganese	75 - 125	78.32		4.55		70.9	104.0		6020A
Mercury	80 - 120	1.90		1.33		0.57	100.0		7471B
Nickel	75 - 125	75.14		0.43	U	70.9	106.0		6020A
Potassium	75 - 125	759		35.7		709.00	102.0		6010C
Selenium	75 - 125	73.75		1.46	J	70.9	102.0		6020A
Silver	75 - 125	7.662		0.057	U	7.1	107.9		6020A
Sodium	75 - 125	744		2.9	U	709.00	104.9		6010C
Thallium	75 - 125	75.582		0.029	U	70.9	106.6		6020A
Vanadium	75 - 125	74.94		1.68	J	70.9	103.3		6020A
Zinc	75 - 125	84.8		8.8	J	70.9	107.2		6020A

An empty field in the Control Limit column indicates the control limit is not applicable

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Metals

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POST SPIKE SAMPLE RECOVERY

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA **Units:** UG/L

Project Name: Wiley Property **Basis:** DRY

Matrix: WATER

Sample Name: WP-032415-WA **Lab Code:** K1503521-001A

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Aluminum	80 - 120	10290.0		5557.0		5000	95		6010C
Antimony	80 - 120	165.864		114.512		50.00	103		6020A
Arsenic	80 - 120	40870.0		20960.0		25000	80		6010C
Barium	80 - 120	52.04		0.47		50.00	103		6020A
Beryllium	80 - 120	50.004		0.010		50.00	100		6020A
Cadmium	80 - 120	52.723		0.014		50.00	105		6020A
Calcium	80 - 120	12510.0		21.5		12500	100		6010C
Chromium	80 - 120	50.83		0.12		50.00	102		6020A
Cobalt	80 - 120	51.247		0.019		50.00	102		6020A
Copper	80 - 120	52.61		0.13		50.00	105		6020A
Lead	80 - 120	53.52		0.18		50.00	107		6020A
Magnesium	80 - 120	12650.0		53.3		12500	101		6010C
Manganese	80 - 120	50.79		0.64		50.00	100		6020A
Mercury	80 - 120	7.17		2.31		5.00	97		7471B
Nickel	80 - 120	51.50		0.06		50.00	103		6020A
Potassium	80 - 120	12730.0		250.6		12500	100		6010C
Selenium	80 - 120	48.66		0.20		50.00	97		6020A
Silver	80 - 120	10.358		0.008		10.00	104		6020A
Sodium	80 - 120	12540.0		20.0		12500	100		6010C
Thallium	80 - 120	52.835		0.004		50.00	106		6020A
Vanadium	80 - 120	50.31		0.24		50.00	100		6020A
Zinc	80 - 120	52.9		1.2		50.00	103		6020A

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Metals
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DUPLICATES

Client: Tetra Tech EM, Incorporated
Service Request: K1503521
Project No.: NA
Units: MG/KG
Project Name: Wiley Property
Basis: DRY
Matrix: SOIL
% Solids: 79.7

Sample Name: WP-032415-WD
Lab Code: K1503521-001D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Aluminum	20	792		1000		23.2	*	6010C
Antimony	20	816.356		818.206		0.2		6020A
Arsenic	20	747000		754000		0.9		6010C
Barium		3.32		3.68		10.3		6020A
Beryllium		0.071	U	0.070	U			6020A
Cadmium		0.100	U	0.098	U			6020A
Calcium		3.1		3.9		22.9		6010C
Chromium		0.86	U	1.19	J	200.0		6020A
Cobalt		0.135	J	0.182	J	29.7		6020A
Copper		0.96	J	1.23	J	24.7		6020A
Iron	20	1550		1920		21.3	*	6010C
Lead		1.30		1.56		18.2		6020A
Magnesium	20	7.60		8.45		10.6		6010C
Manganese	20	4.55		5.44		17.8		6020A
Mercury	20	1.33		1.28		3.8		7471B
Nickel		0.43	U	0.42	U			6020A
Potassium		35.7		37.2		4.1		6010C
Selenium		1.46	J	1.23	J	17.1		6020A
Silver		0.057	U	0.056	U			6020A
Sodium		2.9	U	2.8	U			6010C
Thallium		0.029	U	0.028	U			6020A
Vanadium		1.68	J	2.14	J	24.1		6020A
Zinc		8.8	J	12.5	J	34.7		6020A

An empty field in the Control Limit column indicates the control limit is not applicable.

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Metals

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LABORATORY CONTROL SAMPLE

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

Aqueous LCS Source: **Solid LCS Source:** ERA D080-540

Analyte	Aqueous (ug/L) True	Aqueous (ug/L) Found	Aqueous (ug/L) %R	Solid (mg/kg) True	Solid (mg/kg) Found	Solid (mg/kg) C	Solid (mg/kg) Limits		Solid (mg/kg) %R
Aluminum				8840	7530		42	158	85.2
Antimony				88.2	70.7		26	289	80.2
Arsenic				99.6	115		69	131	115.5
Barium				310	354.0		74	126	114.2
Beryllium				72.30	77.2		74	126	106.8
Cadmium				182.0	201.0		74	126	110.4
Calcium				6790	6650		74	126	97.9
Chromium				136.0	149.0		70	130	109.6
Cobalt				128.0	137.0		74	125	107.0
Copper				102.0	107.0		74	126	104.9
Iron				12600	11800		31	168	93.7
Lead				115.0	133.0		72	129	115.7
Magnesium				3010	3090		66	134	102.7
Manganese				323.0	339.0		75	125	105.0
Mercury				19.9	19.4		51	148	97.5
Nickel				153.0	164.0		73	126	107.2
Potassium				2840	2910		62	138	102.5
Selenium				150.0	163.0		67	133	108.7
Silver				40.4	46.4		66	134	114.9
Sodium				2760	3000		66	134	108.7
Thallium				174.0	200.0		69	132	114.9
Vanadium				97.6	103.0		77	123	105.5
Zinc				161.0	168.0		81	119	104.3

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Metals

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ICP SERIAL DILUTIONS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA **Units:** UG/L

Project Name: Wiley Property

Sample Name: WP-032415-WL **Lab Code:** K1503521-001L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-ence	Q	M
Aluminum	5557.0		5050.0		9.1		P
Antimony	115.000		116.000		0.9		MS
Arsenic	20960.0		21430.0		2.2		P
Barium	0.47		0.42	J	10.6		MS
Beryllium	0.010	U	0.050	U			MS
Cadmium	0.014	U	0.070	U			MS
Calcium	21.5		34.5	J	60.5		P
Chromium	0.12	U	0.60	U			MS
Cobalt	0.019	J	0.060	U	100.0		MS
Copper	0.13	J	0.40	U	100.0		MS
Iron	10850.0		10920.0		0.6		P
Lead	0.18		0.20	U	100.0		MS
Magnesium	53.3		54.5		2.3		P
Manganese	0.64		0.69		7.8		MS
Mercury	2.30		2.40		4.3		CV
Nickel	0.06	U	0.30	U			MS
Potassium	250.6		225.0	U	100.0		P
Selenium	0.20	J	0.70	U	100.0		MS
Silver	0.008	U	0.040	U			MS
Sodium	20.0	U	100.0	U			P
Thallium	0.004	U	0.020	U			MS
Vanadium	0.24	J	0.24	J	0.0		MS
Zinc	1.2	J	2.0	U	100.0		MS

Metals

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DETECTION LIMITS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP/ICP-MS ID #:

GFAA ID #: **AA ID #:**

Analyte	Wave-length (nm)	Back-ground	MRL ug/L	MDL ug/L	M
Mercury	253.7		0.20	0.02	CV

Comments:

Metals

DETECTION LIMITS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP/ICP-MS ID #:

GFAA ID #: **AA ID #:**

Analyte	Wave-length (nm)	Back-ground	MRL ug/L	MDL ug/L	M
Aluminum	167.0		20.0	2.5	P
Arsenic	189.0		20.0	4.0	P
Calcium	393.3		20.0	4.5	P
Iron	259.9		20.0	10.0	P
Magnesium	279.5		10.0	1.0	P
Potassium	766.5		200	45.0	P
Sodium	589.5		200	20.0	P

Comments:

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Metals

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DETECTION LIMITS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP/ICP-MS ID #: Agilent ICPMS

GFAA ID #: **AA ID #:**

Analyte	Isotope	Back-ground	MRL ug/L	MDL ug/L	M
Antimony	123		0.100	0.020	MS
Barium	137		0.10	0.04	MS
Beryllium	9		0.040	0.010	MS
Cadmium	111		0.040	0.014	MS
Chromium	52		0.40	0.12	MS
Cobalt	59		0.040	0.012	MS
Copper	65		0.20	0.08	MS
Lead	208		0.10	0.04	MS
Manganese	55		0.10	0.04	MS
Nickel	60		0.40	0.06	MS
Selenium	78		2.00	0.14	MS
Silver	107		0.040	0.008	MS
Thallium	205		0.040	0.004	MS
Vanadium	51		0.40	0.04	MS
Zinc	66		2.0	0.4	MS

Comments:

ALS Group USA, Corp.
dba ALS Environmental

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03

Analyte	Wave-length (nm)	Interelement Correction Factors for: Al	Ca	Fe	Mg	B
Aluminum	394.401	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	217.581	0.0000000	0.0000000	-0.0009010	0.0000000	0.0000000
Arsenic	189.042	0.0000330	0.0000000	0.0000000	0.0000000	0.0000000
Barium	455.403	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	234.861	0.0000000	0.0000000	0.0000080	0.0000000	0.0000000
Boron	249.678	0.0000000	0.0000000	-0.0006800	0.0000000	0.0000000
Cadmium	226.502	0.0000000	0.0000000	0.0001570	0.0000000	0.0000000
Calcium	393.366	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.616	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	327.396	0.0000000	0.0000160	0.0000000	0.0000000	0.0000000
Iron	259.94	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.353	-0.0000780	0.0000000	0.0000590	0.0000000	0.0000000
Lithium	670.784	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	285.213	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000120	0.0000370	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.604	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Phosphorus	214.914	-0.0007840	0.0000000	0.0006520	0.0000000	0.0000000
Potassium	766.491	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silicon	251.611	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.592	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Strontium	407.771	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.856	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Tin	189.989	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	336.121	0.0000000	0.0000110	0.0000000	0.0000440	0.0000000
Vanadium	292.402	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

ALS Group USA, Corp.
dba ALS Environmental

Metals

- 11A -

ICP INTERELEMENT CORRECTION FACTORS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03

Zinc	213.856	0.0000000	0.0000000	0.0001170	0.0000000	0.0000000

Comments:

ALS Group USA, Corp.
dba ALS Environmental

Metals

- 11B -

ICP INTERELEMENT CORRECTION FACTORS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03

Analyte	Wave-length (nm)	Interelement Correction Factors for: Ba	Cd	Co	Cr	Cu
Aluminum	394.401	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	217.581	0.0000000	0.0000000	0.0000000	0.0004650	-0.0009350
Arsenic	189.042	0.0000000	0.0000000	0.0000000	0.0005140	0.0000000
Barium	455.403	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	234.861	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Boron	249.678	0.0000000	0.0000000	0.0025890	0.0003110	0.0000000
Cadmium	226.502	0.0000000	0.0000000	-0.0000110	0.0000330	0.0000000
Calcium	393.366	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.716	0.0000000	-0.0001480	0.0000000	0.0000000	0.0000000
Cobalt	228.616	-0.0001220	0.0000000	0.0000000	0.0000000	0.0000000
Copper	327.396	0.0000000	0.0000000	0.0002590	0.0000000	0.0000000
Iron	259.94	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.353	0.0000000	0.0000000	0.0001270	0.0000000	0.0003500
Lithium	670.784	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	285.213	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.604	0.0000000	0.0000000	-0.0001870	0.0000000	0.0000000
Phosphorus	214.914	0.0000000	-0.0015740	0.0000000	0.0000000	0.0052080
Potassium	766.491	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.0	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silicon	251.611	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.592	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Strontium	407.771	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.856	0.0000000	0.0000000	0.0031300	0.0003080	0.0000000
Tin	189.989	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	336.121	0.0000000	0.0000000	0.0000270	0.0000000	0.0000000
Vanadium	292.402	0.0000000	0.0000000	0.0000000	-0.0058770	0.0000000

Comments:

ALS Group USA, Corp.
dba ALS Environmental

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03

Zinc	213.856	0.0000000	0.0000000	0.0000000	0.0000000	0.0010410

Comments:

ALS Group USA, Corp.
dba ALS Environmental

Metals

- 11B -

ICP INTERELEMENT CORRECTION FACTORS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03

Analyte	Wave-length (nm)	Interelement Correction Factors for: Mn	Mo	Ni	Sb	Si
Aluminum	394.401	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	217.581	-0.0007640	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.042	-0.0002720	0.0015570	0.0000000	0.0000000	0.0000000
Barium	455.403	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	234.861	-0.0000630	-0.0004470	-0.0000170	0.0000000	0.0000000
Boron	249.678	0.0000000	-0.0019240	0.0000000	0.0000000	0.0000000
Cadmium	226.502	0.0000000	-0.0000110	-0.0000150	0.0000000	0.0000000
Calcium	393.366	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.716	0.0000000	0.0000620	0.0000000	0.0000000	0.0000000
Cobalt	228.616	0.0000000	-0.0012500	0.0001140	0.0000000	0.0000000
Copper	327.396	0.0000000	-0.0002610	0.0000000	0.0000000	0.0000000
Iron	259.94	0.0000000	-0.0002450	0.0000000	0.0000000	0.0000000
Lead	220.353	0.0000000	-0.0007250	0.0002650	0.0000000	0.0000000
Lithium	670.784	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	285.213	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.604	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Phosphorus	214.914	-0.0006320	0.0105360	0.0000000	0.0000000	0.0000000
Potassium	766.491	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.0	0.0004420	0.0000000	0.0000000	0.0000000	0.0000000
Silicon	251.611	0.0000000	0.0731890	0.0000000	0.0000000	0.0000000
Silver	328.068	0.0001350	0.0001470	0.0000000	0.0000000	0.0000000
Sodium	589.592	0.0000000	0.0023580	0.0000000	0.0000000	0.0000000
Strontium	407.771	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.856	0.0006530	0.0000000	0.0000000	0.0000000	0.0000000
Tin	189.989	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	336.121	0.0000000	0.0000400	0.0001110	0.0000000	0.0000000
Vanadium	292.402	-0.0011210	-0.0000900	0.0000000	0.0000000	0.0000000

Comments:

ALS Group USA, Corp.
dba ALS Environmental

Metals

- 11B -

ICP INTERELEMENT CORRECTION FACTORS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03

Zinc	213.856	0.0000000	0.0000000	0.0056230	0.0000000	0.0000000

Comments:

ALS Group USA, Corp.
dba ALS Environmental

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03

Analyte	Wave-length (nm)	Interelement Correction Factors for: Ti	V			
Aluminum	394.401	0.0000000	0.0000000			
Antimony	217.581	0.0000000	0.0021710			
Arsenic	189.042	0.0000000	0.0001150			
Barium	455.403	0.0000000	0.0000000			
Beryllium	234.861	0.0000000	0.0000000			
Boron	249.678	0.0000000	-0.0005070			
Cadmium	226.502	0.0001270	0.0000000			
Calcium	393.366	0.0000000	0.0000000			
Chromium	267.716	0.0000000	-0.0000640			
Cobalt	228.616	0.0024440	0.0000000			
Copper	327.396	0.0001170	-0.0000910			
Iron	259.94	0.0000000	0.0000000			
Lead	220.353	0.0000000	0.0000000			
Lithium	670.784	0.0000000	0.0000000			
Magnesium	285.213	0.0000000	0.0000000			
Manganese	257.61	0.0000000	0.0000000			
Molybdenum	202.03	0.0000000	0.0000000			
Nickel	231.604	0.0000000	0.0000000			
Phosphorus	214.914	0.0000000	-0.0020860			
Potassium	766.491	0.0000000	0.0000000			
Selenium	196.0	0.0000000	0.0000000			
Silicon	251.611	0.0000000	0.0000000			
Silver	328.068	0.0000000	0.0000780			
Sodium	589.592	0.0000000	0.0000000			
Strontium	407.771	0.0000000	0.0000000			
Thallium	190.856	-0.0005060	0.0002630			
Tin	189.989	0.0000000	0.0000000			
Titanium	336.121	0.0000000	0.0000000			
Vanadium	292.402	0.0004260	0.0000000			

Comments:

ALS Group USA, Corp.
dba ALS Environmental

Metals

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ICP INTERELEMENT CORRECTION FACTORS

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03

Zinc	213.856	0.0000000	0.0000000			

Comments:

Metals
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ICP LINEAR RANGES (QUARTERLY)

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: K-ICP-AES-03

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	Method
Aluminum	15.000	270000	6010C
Arsenic	15.000	90000	6010C
Calcium	15.000	900000	6010C
Iron	15.000	360000	6010C
Magnesium	15.000	90000	6010C
Potassium	15.000	450000	6010C
Sodium	15.000	450000	6010C

Comments:

ALS Group USA, Corp.
dba ALS Environmental

Metals
-12-
ICP LINEAR RANGES (QUARTERLY)

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

ICP ID Number: Agilent ICPMS

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	Method
Antimony	0.300	2700	6020A
Barium	0.300	2700	6020A
Beryllium	1.000	2700	6020A
Cadmium	1.000	2700	6020A
Chromium	0.300	2700	6020A
Cobalt	0.300	2700	6020A
Copper	0.300	2700	6020A
Lead	0.300	2700	6020A
Manganese	0.300	2700	6020A
Nickel	0.300	2700	6020A
Selenium	1.000	2700	6020A
Silver	0.300	225	6020A
Thallium	0.300	2700	6020A
Vanadium	0.300	2700	6020A
Zinc	0.300	2700	6020A

Comments:

Metals
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PREPARATION LOG

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

Method: MS

Sample ID	Preparation Date	Initial Weight (g)	Final Volume(mL)
K1503521-001	04/09/15	1.76	100.0
K1503521-001D	04/09/15	1.79	100.0
K1503521-001S	04/09/15	1.77	100.0
KQ1503409-01	04/09/15	1.02	100.0
KQ1503409-02	04/09/15	1.00	100.0

ALS Group USA, Corp.
dba ALS Environmental

Metals
-13-
PREPARATION LOG

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

Method: P

Sample ID	Preparation Date	Initial Weight (g)	Final Volume (mL)
K1503521-001	04/09/15	1.76	100.0
K1503521-001D	04/09/15	1.79	100.0
K1503521-001S	04/09/15	1.77	100.0
KQ1503409-01	04/09/15	1.02	100.0
KQ1503409-02	04/09/15	1.00	100.0

Metals
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PREPARATION LOG

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA

Project Name: Wiley Property

Method: CV

Sample ID	Preparation Date	Initial Weight (g)	Final Volume (mL)
K1503521-001	04/09/15	0.55	50.0
K1503521-001D	04/09/15	0.56	50.0
K1503521-001S	04/09/15	0.55	50.0
KQ1503430-02	04/09/15	0.25	50.0
KQ1503430-03	04/09/15	0.50	50.0

ALS Group USA, Corp.
dba ALS Environmental

Metals
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ANALYSIS RUN LOG

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA **Run Number:** 040915B HG2

Project Name: Wiley Property

Instrument ID Number: K-CVAA-02 **Method:** CV

Start Date: 04/09/15 **End Date:** 04/09/15

Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
Calibration Blank	1.0	13:05																X									
Standard #1	1.0	13:06																X									
Standard #2	1.0	13:08																X									
Standard #3	1.0	13:10																X									
Standard #4	1.0	13:11																X									
Standard #5	1.0	13:13																X									
ICV1	1.0	13:15																X									
ICB1	1.0	13:16																X									
CRDL1	1.0	13:18																X									
CCV1	1.0	13:19																X									
CCB1	1.0	13:21																X									
KQ1503430-03	1.0	13:23																X									
ZZZZZZ	1.0	13:24																									
KQ1503430-02	50.0	13:26																X									
ZZZZZZ	1.0	13:27																									
ZZZZZZ	1.0	13:29																									
ZZZZZZ	1.0	13:31																									
ZZZZZZ	1.0	13:32																									
ZZZZZZ	1.0	13:34																									
ZZZZZZ	1.0	13:36																									
ZZZZZZ	1.0	13:38																									
CCV2	1.0	13:40																X									
CCB2	1.0	13:42																X									
ZZZZZZ	1.0	13:43																									
ZZZZZZ	1.0	13:46																									
ZZZZZZ	1.0	13:47																									
ZZZZZZ	1.0	13:49																									
ZZZZZZ	1.0	13:51																									
ZZZZZZ	1.0	13:52																									
ZZZZZZ	1.0	13:54																									
ZZZZZZ	1.0	13:55																									
ZZZZZZ	1.0	13:57																									

* - Denotes additional elements (other than the standard CLP elements) are represented on another Form 14

ALS Group USA, Corp.
dba ALS Environmental

Metals
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ANALYSIS RUN LOG

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA **Run Number:** 040915B HG2

Project Name: Wiley Property

Instrument ID Number: K-CVAA-02 **Method:** CV

Start Date: 04/09/15 **End Date:** 04/09/15

Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.0	13:59																									
CCV3	1.0	14:00																X									
CCB3	1.0	14:02																X									
ZZZZZZ	1.0	14:04																									
ZZZZZZ	1.0	14:05																									
K1503521-001	5.0	14:08																X									
K1503521-001A	5.0	14:09																X									
K1503521-001D	5.0	14:11																X									
K1503521-001S	5.0	14:12																X									
ZZZZZZ	1.0	14:14																									
K1503521-001L	5.0	14:21																X									
CCV4	1.0	14:22																X									
CCB4	1.0	14:24																X									

* - Denotes additional elements (other than the standard CLP elements) are represented on another Form 14

ALS Group USA, Corp.
dba ALS Environmental

Metals
- 14 -
ANALYSIS RUN LOG

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA **Run Number:** 041415AICP03

Project Name: Wiley Property

Instrument ID Number: K-ICP-AES-03 **Method:** P

Start Date: 04/14/15 **End Date:** 04/14/15

Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
BLK	1.0	08:55		X		X				X				X		X				X			X				
STD A	1.0	08:57		X						X						X											
STD B	1.0	09:00		X		X								X						X			X				
ICV1	1.0	09:02		X						X						X											
ZZZZZZ	1.0	09:07																									
ICV1	1.0	09:09		X		X				X				X		X				X			X				
ICB1	1.0	09:13		X		X				X				X		X				X			X				
ZZZZZZ	1.0	09:16																									
LLICV1	1.0	09:19		X		X				X						X				X			X				
LLICV	1.0	09:31												X													
ZZZZZZ	1.0	09:33																									
CCV1	1.0	09:37		X		X				X				X		X				X			X				
CCV1	1.0	09:42		X						X						X											
CCB1	1.0	09:49		X		X				X				X		X				X			X				
ICSA	1.0	09:52		X		X				X				X		X				X			X				
ICSAB	1.0	09:54		X		X				X				X		X				X			X				
ZZZZZZ	1.0	09:57																									
CCV2	1.0	10:00		X		X				X				X		X				X			X				
CCV2	1.0	10:03		X						X						X											
CCB2	1.0	10:05		X		X				X				X		X				X			X				
ZZZZZZ	2.0	10:23																									
KQ1503409-01	2.0	10:26		X		X				X				X		X				X			X				
KQ1503409-02	2.0	10:31		X		X				X				X		X				X			X				
K1503521-001	2.0	10:33		X						X				X		X				X			X				
K1503521-001L	5.0	10:36		X						X				X		X				X			X				
K1503521-001D	2.0	10:38		X						X				X		X				X			X				
K1503521-001S	2.0	10:40		X						X				X		X				X			X				
K1503521-001A	1.0	10:43		X						X						X				X			X				
ZZZZZZ	100.0	10:50																									
K1503521-001	500.0	10:58				X																					
ZZZZZZ	1.0	11:00																									
CCV3	1.0	11:03		X		X				X				X		X				X			X				

* - Denotes additional elements (other than the standard CLP elements) are represented on another Form 14

ALS Group USA, Corp.
dba ALS Environmental

Metals
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ANALYSIS RUN LOG

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA **Run Number:** 041415AICP03

Project Name: Wiley Property

Instrument ID Number: K-ICP-AES-03 **Method:** P

Start Date: 04/14/15 **End Date:** 04/14/15

Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCV3	1.0	11:06		X						X						X											
ZZZZZZ	1.0	11:08																									
CCB3	1.0	11:24		X		X				X				X		X				X			X				
K1503521-001L	500.0	11:27				X																					
K1503521-001D	500.0	11:29				X																					
K1503521-001S	500.0	11:32				X																					
K1503521-001A	500.0	11:34				X																					
ZZZZZZ	1.0	11:37																									
ZZZZZZ	1.0	11:40																									
ZZZZZZ	1.0	11:42																									
ZZZZZZ	1.0	11:45																									
ZZZZZZ	1.0	11:47																									
ZZZZZZ	1.0	11:49																									
CCV4	1.0	11:52		X		X				X				X		X				X			X				
CCV4	1.0	11:54		X						X						X											
CCB4	1.0	11:57		X		X				X				X		X				X			X				
LLCCV1	1.0	12:00		X						X				X		X							X				
LLCCV1	1.0	12:05				X														X							

* - Denotes additional elements (other than the standard CLP elements) are represented on another Form 14

ALS Group USA, Corp.
dba ALS Environmental

Metals
- 14 -
ANALYSIS RUN LOG

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Run Number: 041715A

Project No.: NA

Project Name: Wiley Property

Instrument ID Number: Agilent ICPMS **Method:** MS

Start Date: 04/17/15 **End Date:** 04/17/15

Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
Blank	1.0	10:05			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
25ppb	1.0	10:09			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
ICV1	1.0	10:13			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
CCV1	1.0	10:16			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
ICB1	1.0	10:20			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
CCB1	1.0	10:24			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
LLICVS1	1.0	10:28			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
ICS-A1	1.0	10:31			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
ICS-AB1	1.0	10:35			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
ZZZZZZ	1.0	10:39																									
ZZZZZZ	1.0	10:43																									
CCV2	1.0	10:50			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
CCB2	1.0	10:54			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
ZZZZZZ	1.0	10:58																									
ZZZZZZ	1.0	11:05																									
LLCCVS2	1.0	11:12			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
KQ1503409-02	5.0	11:16			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
ZZZZZZ	5.0	11:19																									
ZZZZZZ	5.0	11:23																									
ZZZZZZ	5.0	11:27																									
ZZZZZZ	1.0	11:30																									
ZZZZZZ	5.0	11:34																									
ZZZZZZ	1.0	11:38																									
KQ1503409-01	20.0	11:42			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
CCV3	1.0	11:46			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
ZZZZZZ	1.0	11:49																									
CCB3	1.0	11:53			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
LLCCVS2	1.0	12:00			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
K1503521-001	100.0	12:29			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
K1503521-001D	100.0	12:33			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
K1503521-001L	100.0	12:36			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
K1503521-001A	100.0	12:40			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	

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ALS Group USA, Corp.
dba ALS Environmental

Metals
- 14 -
ANALYSIS RUN LOG

Client: Tetra Tech EM, Incorporated **Service Request:** K1503521

Project No.: NA **Run Number:** 041715A

Project Name: Wiley Property

Instrument ID Number: Agilent ICPMS **Method:** MS

Start Date: 04/17/15 **End Date:** 04/17/15

Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
K1503521-001S	100.0	12:44			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
ZZZZZZ	1.0	12:47																									
CCV4	1.0	12:51			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
CCB4	1.0	12:55			X	X	X		X		X	X	X		X		X		X		X	X		X	X	X	
LLCCVS3	1.0	12:59			X	X	X		X		X	X	X		X		X		X		X	X		X	X		
ZZZZZZ	1.0	13:02																									
ZZZZZZ	1.0	13:06																									
LLCCVS3	1.0	13:10																								X	

* - Denotes additional elements (other than the standard CLP elements) are represented on another Form 14

Metals

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS Group USA, Corp. Contract: _____

Lab Code: ALSK Case No.: _____ NRAS No.: _____ SDG NO.: K1503521

ICP-MS Instrument ID: Agilent ICPMS Start Date: 04/17/2015 End Date: 04/17/2015

Sample No.	Client ID	Time	Internal Standards %RI For:											
			Element Sc 45_NG	Q	Element Ge 72_H2	Q	Element Ge 72_He	Q	Element In115_He	Q	Element Lu175_He	Q	Element	Q
Blank	Blank	1005	100		100		100		100		100			
25ppb	25ppb	1009	101		100		100		101		102			
ICV1	ICV	1013	102		101		101		100		100			
CCV1	CCV	1016	100		101		103		101		100			
ICB1	ICB	1020	102		102		100		100		99			
CCB1	CCB	1024	102		102		102		101		102			
LLICVS1	LLICVS1	1028	101		101		102		102		102			
ICS-A1	ICSA	1031	101		104		104		98		100			
ICS-AB1	ICSAB	1035	105		104		105		100		102			
ZZZZZZ	ZZZZZZ	1039												
ZZZZZZ	ZZZZZZ	1043												
CCV2	CCV	1050	104		106		105		104		102			
CCB2	CCB	1054	105		104		104		103		101			
ZZZZZZ	ZZZZZZ	1058												
ZZZZZZ	ZZZZZZ	1105												
LLCCVS2	LLCCVS2	1112	104		102		102		103		103			
KQ1503409-02	Method Blank	1116	104		102		103		104		103			
ZZZZZZ	ZZZZZZ	1119												
ZZZZZZ	ZZZZZZ	1123												
ZZZZZZ	ZZZZZZ	1127												
ZZZZZZ	ZZZZZZ	1130												
ZZZZZZ	ZZZZZZ	1134												
ZZZZZZ	ZZZZZZ	1138												
KQ1503409-01	Lab Control	1142	102		106		106		102		101			
CCV3	CCV	1146	103		105		104		102		101			
ZZZZZZ	ZZZZZZ	1149												
CCB3	CCB	1153	107		104		104		104		105			
LLCCVS2	LLCCVS2	1200	104		102		102		104		102			
K1503521-001	WP-032415-W	1229	103		103		103		104		101			
K1503521-001D	WP-032415-WD	1233	103		102		101		102		102			
K1503521-001L	WP-032415-WL	1236	101		103		102		102		102			
K1503521-001A	WP-032415-WA	1240	102		104		103		103		102			
K1503521-001S	WP-032415-WS	1244	102		104		103		103		103			
ZZZZZZ	ZZZZZZ	1247												
CCV4	CCV	1251	100		101		100		99		101			
CCB4	CCB	1255	102		100		98		100		103			
LLCCVS3	LLCCVS3	1259	99		100		98		101		102			
ZZZZZZ	ZZZZZZ	1302												
ZZZZZZ	ZZZZZZ	1306												
LLCCVS3	LLCCVS3	1310	104		104		101		102		101			

ALS Environmental

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Environmental

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

Benchsheet

Service Request #: K1503191, KQ1503397, K1503328, K1503352, K1503452, K1503501, K1503503, K1503521, K1503529, K1503546, K1503558, K1503560, K1503564

Run #: 439626

Test: TS

Balance ID: K-Balance-20

Method: 160.3 Modified

Pan ID:	Lab Code:	Tare (g)	Wet Wt. (g)	Tare + Dry Wt. (g)	Dry Weight (g)	% Total Solids	RPD
	K1503191-001	1.30	12.20	6.56	5.26	43.1	
	K1503191-001DUP	1.29	11.42	6.18	4.89	42.8	<1
	K1503328-001	1.29	10.58	10.30	9.01	85.2	
	K1503328-001DUP	1.28	10.46	10.11	8.83	84.4	<1
	K1503352-001	1.29	8.46	9.04	7.75	91.6	
	K1503452-001	1.29	10.23	11.21	9.92	97.0	
	K1503452-001DUP	1.29	10.20	11.17	9.88	96.9	<1
	K1503452-002	1.29	10.22	11.31	10.0	98.0	
	K1503452-003	1.29	10.42	11.47	10.2	97.7	
	K1503452-004	1.29	10.44	11.38	10.1	96.6	
	K1503452-005	1.28	10.42	11.40	10.1	97.1	
	K1503452-006	1.28	10.41	11.05	9.77	93.9	
	K1503452-007	1.28	10.05	11.12	9.84	97.9	
	K1503501-001	1.28	22.59	4.97	3.69	16.3	
	K1503503-001	1.28	10.57	4.50	3.22	30.5	
	K1503521-001	1.28	14.01	12.45	11.2	79.7	
	K1503529-002	1.28	17.59	2.25	0.970	5.51	
	K1503546-001	1.28	12.59	11.87	10.6	84.1	
	K1503558-001	1.28	18.20	4.35	3.07	16.9	
	K1503560-001	1.28	10.24	10.41	9.13	89.2	
	K1503560-002	1.29	10.90	11.04	9.75	89.4	
	K1503564-001	1.27	12.33	4.22	2.95	23.9	

	Oven ID	Temp In	Temp Out	Date In	Time In	Date Out	Time Out	Thermometer ID
Oven1	K-OVEN-07	105	105	4/8/2015	13:20	4/9/2015	08:31	

	Cal EQID	Cal Start Value	Cal End Value	Start Date	Start Time	End Date	End Time
Calibration1	K-Balance-16	1.00, 100.01	1.00, 100.00	4/8/2015	12:58	4/8/2015	13:20
Calibration2	K-Balance-16	1.00, 100.01	1.01, 100.01	4/9/2015	08:59	4/9/2015	09:03

EL 4/8/15

Comments: DJM

Analytical Results Summary

Instrument Name: K-Balance-20 **Analyst:** DMADDEN **Analysis Lot:** 439626 **Method/Testcode:**

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	%
K1503191-001	Solids, Total	N/A		Sediment	43.10 Percent	12.20 g	43.1 Percent	1			
K1503328-001	Solids, Total	N/A		Soil	85.20 Percent	10.58 g	85.2 Percent	1			
K1503352-001	Solids, Total	N/A		Solid Fuel	91.60 Percent	8.46 g	91.6 Percent	1			
K1503452-001	Solids, Total	N/A		Soil	97.00 Percent	10.23 g	97.0 Percent	1			
K1503452-002	Solids, Total	N/A		Soil	98.00 Percent	10.22 g	98.0 Percent	1			
K1503452-003	Solids, Total	N/A		Soil	97.70 Percent	10.42 g	97.7 Percent	1			
K1503452-004	Solids, Total	N/A		Soil	96.60 Percent	10.44 g	96.6 Percent	1			
K1503452-005	Solids, Total	N/A		Soil	97.10 Percent	10.42 g	97.1 Percent	1			
K1503452-006	Solids, Total	N/A		Soil	93.90 Percent	10.41 g	93.9 Percent	1			
K1503452-007	Solids, Total	N/A		Soil	97.90 Percent	10.05 g	97.9 Percent	1			
K1503501-001	Solids, Total	N/A		Sludge, Solid	16.30 Percent	22.59 g	16.3 Percent	1			
K1503503-001	Solids, Total	N/A		Misc. Solid	30.50 Percent	10.57 g	30.5 Percent	1			
K1503521-001	Solids, Total	N/A		Soil	79.70 Percent	14.01 g	79.7 Percent	1			
K1503529-002	Solids, Total	N/A		Sludge, Solid	5.51 Percent	17.59 g	5.51 Percent	1			
K1503546-001	Solids, Total	N/A		Soil	84.10 Percent	12.59 g	84.1 Percent	1			
K1503558-001	Solids, Total	N/A		Biosolids Solids	16.90 Percent	18.20 g	16.9 Percent	1			
K1503560-001	Solids, Total	N/A		Soil	89.20 Percent	10.24 g	89.2 Percent	1			
K1503560-002	Solids, Total	N/A		Soil	89.40 Percent	10.90 g	89.4 Percent	1			
K1503564-001	Solids, Total	N/A		Biosolids Solids	23.90 Percent	12.33 g	23.9 Percent	1			
KQ1503397-01	Solids, Total	DUP	K1503191-001	Sediment	42.80 Percent	11.42 g	42.8 Percent	1			
KQ1503397-02	Solids, Total	DUP	K1503328-001	Soil	84.40 Percent	10.46 g	84.4 Percent	1			
KQ1503397-03	Solids, Total	DUP	K1503452-001	Soil	96.90 Percent	10.20 g	96.9 Percent	1			

indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Sequence # IC0704 2015 (22) | Ion Chromatography Data Quality Report Inorganics | Run # 441229

1. Holding times met for all samples analyzed? yes/no/NA
2. Are dilutions within upper limits of the curve? yes/no/NA
3. Were peaks manually integrated? yes/no/NA
   a.)Does DOD QUAPP apply? yes/no/NA
4. Are detection limits reported correctly? yes/no/NA
5. Are all quality control criteria met?
   a. Method Blanks, CCV's, CCB's, LCS's, Dups, and Spikes analyzed at the proper frequency? yes/no/NA
   b. Are CCV's and CCB's all within acceptance limits? yes/no/NA
   c. Are results for Method Blanks all ND? yes/no/NA
   d. Are all QC samples within acceptance criteria? (LCS% rec, MS% rec, Duplicate RPD's, etc.) yes/no/NA
   e. Are all exceptions explained? yes/no/NA
6. Are all samples labelled correctly? yes/no/NA

CAS Standard Identification Codes and Abbreviated Footnotes for Chromatograms

G1 Sample was analyzed past the end of recommended holding time. See Nonconformity sheet.
G2 Sample was reanalyzed past holding time. Initial analysis was performed within recommended holding time.
G4 Sample was received past the end of recommended holding time.
R1 High RPD is because the duplicate sample results are less than three times the method reporting limit.
i MRL is elevated because of matrix interferences and the sample required diluting.
F Sample filtered primary to analysis.

LCS	CAS ID# = AN13-92-R		Expires 4.20.15
Fluoride	True Value = 5.0 ppm	10K CAS ID # = 13-Gen-AN1-2-H	Expires: 6.23.15
Chloride	True Value = 5.0 ppm	10K CAS ID # = 13-Gen-AN1-2-I	Expires: ↓
Nitrite	True Value = 2.5ppm	10K CAS ID # = 13-Gen-AN1-2-A	Expires: 6.12.15
Bromide	True Value = 2.5 ppm	10K CAS ID # = 13-Gen-AN1-2-J	Expires: 6.23.15
Nitrate	True Value = 2.5 ppm	10K CAS ID # = 13-Gen-AN1-2-K	Expires: ↓
Sulfate	True Value = 5.0 ppm	10K CAS ID # = 13-Gen-AN1-2-L	Expires: ↓

CCV	CAS ID # = AN13-27-R		Expires 4.20.15
Fluoride	True Value = 5.0 ppm	10K CAS ID # = 13-Gen-an1-2-T	Expires: 10.15.15
Chloride	True Value = 5.0 ppm	10K CAS ID # = 13-Gen-an1-2-O	Expires: 8.2.15
Nitrite	True Value = 2.5 ppm	10K CAS ID # = 13-Gen-an1-2-B	Expires: 6.10.15
Bromide	True Value = 2.5 ppm	10K CAS ID # = 13-Gen-AN1-2-C	Expires: ↓
Nitrate	True Value = 2.5 ppm	10K CAS ID # = 13-Gen-AN1-2-D	Expires: ↓
Sulfate	True Value = 5.0 ppm	10K CAS ID # = 13-Gen-an1-2-S	Expires: 8.30.15

Spike 2.0ppm X dilution factor	CAS ID# = AN13-60-R		Expires 4.20.15
Fluoride	10K CAS ID # = 13-Gen-an1-2-T	Expires: CCW	
Chloride	10K CAS ID # = 13-Gen-an1-2-O	Expires: ↓	
Nitrite	10K CAS ID # = 13-Gen-an1-2-B	Expires: ↓	
Bromide	10K CAS ID # = 13-Gen-AN1-2-C	Expires: ↓	
Nitrate	10K CAS ID # = 13-Gen-AN1-2-D	Expires: ↓	
Sulfate	10K CAS ID # = 13-Gen-an1-2-S	Expires: ↓	

Analyst: BH Date: 4.20.15

First Review: BH Date: 4.20.15

Final Review: [illegible] Date: 4/21/15

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Analytical Results Summary

Instrument Name: K-IC-07 **Analyst:** BHETLAND **Analysis Lot:** 441229 **Method/Testcode:**

ıb Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	%
1503521-001	Chloride	N/A		Soil	0.17 mg/L	2.5400 g	5.0 mg/Kg U	2		5.0	
1503522-001	Chloride	N/A		Soil	2.07 mg/L	2.5689 g	20.1 mg/Kg #	5	2.4	9.7	
1503652-001	Sulfate	N/A		Biosolids Solids	73.54 mg/L	2.6062 g	705 mg/Kg #	50	23	96	
1503737-001	Chloride	N/A		Soil	353.93 mg/L	2.5303 g	3500 mg/Kg #	100		200	
1503737-001	Sulfate	N/A		Soil	301.69 mg/L	2.5303 g	2980 mg/Kg #	100		100	
1503737-002	Chloride	N/A		Soil	292.34 mg/L	2.5263 g	2890 mg/Kg #	100		200	
1503737-002	Sulfate	N/A		Soil	154.74 mg/L	2.5263 g	1530 mg/Kg #	100		100	
Q1503869-01	Chloride	MB		Soil	0.00 mg/L	2.5000 g	2.0 mg/Kg U	1		2.0	
Q1503869-01	Chloride	MB		Soil	0.00 mg/L	2.5000 g	2.0 mg/Kg U	1	0.5	2.0	
Q1503869-01	Sulfate	MB		Soil	0.00 mg/L	2.5000 g	1.0 mg/Kg U	1		1.0	
Q1503869-01	Sulfate	MB		Soil	0.00 mg/L	2.5000 g	2.0 mg/Kg U	1	0.5	2.0	
Q1503869-02	Chloride	LCS		Soil	36.64 mg/L	1.0000 g	366 mg/Kg	10		20	9
Q1503869-02	Chloride	LCS		Soil	36.64 mg/L	1.0000 g	366 mg/Kg	10	5	20	9
Q1503869-02	Sulfate	LCS		Soil	32.38 mg/L	1.0000 g	324 mg/Kg	10		10	9
Q1503869-02	Sulfate	LCS		Soil	32.38 mg/L	1.0000 g	324 mg/Kg	10	5	20	9
Q1503869-03	Chloride	N/A		Soil	353.93 mg/L	2.5303 g	3500 mg/Kg #	100		200	
Q1503869-03	Chloride	N/A		Soil	353.93 mg/L	2.5303 g	3500 mg/Kg #	100	50	200	
Q1503869-03	Sulfate	N/A		Soil	301.69 mg/L	2.5303 g	2980 mg/Kg #	100		100	
Q1503869-03	Sulfate	N/A		Soil	301.69 mg/L	2.5303 g	2980 mg/Kg #	100	50	200	
Q1503869-04	Chloride	MS	KQ1503869-03	Soil	783.99 mg/L	2.5718 g	7620 mg/Kg #	200		400	1
Q1503869-04	Chloride	MS	KQ1503869-03	Soil	783.99 mg/L	2.5718 g	7620 mg/Kg #	200	100	390	1
Q1503869-04	Sulfate	MS	KQ1503869-03	Soil	671.06 mg/L	2.5718 g	6520 mg/Kg #	200		200	9
Q1503869-04	Sulfate	MS	KQ1503869-03	Soil	671.06 mg/L	2.5718 g	6520 mg/Kg #	200	100	390	9
Q1503869-05	Chloride	DMS	KQ1503869-03	Soil	791.41 mg/L	2.5722 g	7690 mg/Kg #	200		400	1
Q1503869-05	Chloride	DMS	KQ1503869-03	Soil	791.41 mg/L	2.5722 g	7690 mg/Kg #	200	100	390	1
Q1503869-05	Sulfate	DMS	KQ1503869-03	Soil	683.27 mg/L	2.5722 g	6640 mg/Kg #	200		200	9
Q1503869-05	Sulfate	DMS	KQ1503869-03	Soil	683.27 mg/L	2.5722 g	6640 mg/Kg #	200	100	390	9
Q1503869-06	Chloride	DUP	KQ1503869-03	Soil	356.81 mg/L	2.5363 g	3520 mg/Kg #	100		200	
Q1503869-06	Chloride	DUP	KQ1503869-03	Soil	356.81 mg/L	2.5363 g	3520 mg/Kg #	100	50	200	
Q1503869-06	Sulfate	DUP	KQ1503869-03	Soil	302.17 mg/L	2.5363 g	2980 mg/Kg #	100		100	
Q1503869-06	Sulfate	DUP	KQ1503869-03	Soil	302.17 mg/L	2.5363 g	2980 mg/Kg #	100	50	200	
Q1503869-07	Chloride	MS	K1503737-001	Soil	783.99 mg/L	2.5718 g	7620 mg/Kg #	200		400	1
Q1503869-07	Sulfate	MS	K1503737-001	Soil	671.06 mg/L	2.5718 g	6520 mg/Kg #	200		200	9
Q1503869-08	Chloride	DMS	K1503737-001	Soil	791.41 mg/L	2.5722 g	7690 mg/Kg #	200		400	1
Q1503869-08	Sulfate	DMS	K1503737-001	Soil	683.27 mg/L	2.5722 g	6640 mg/Kg #	200		200	9
Q1503869-09	Chloride	DUP	K1503737-001	Soil	356.81 mg/L	2.5363 g	3520 mg/Kg #	100		200	

ıdicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-IC-07 **Analyst:** BHETLAND **Analysis Lot:** 441229 **Method/Testcode:**

ab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	%
Q1503869-09	Sulfate	DUP	K1503737-001	Soil	302.17 mg/L	2.5363 g	2980 mg/Kg #	100		100	
Q1503876-01	Chloride	CCV		Soil	5.08 mg/L	g	5.08 mg/L	1			
Q1503876-01	Chloride	CCV		Soil	5.08 mg/L	g	5.08 mg/L	1			
Q1503876-01	Sulfate	CCV		Soil	5.15 mg/L	g	5.15 mg/L	1			
Q1503876-01	Sulfate	CCV		Soil	5.15 mg/L	g	5.15 mg/L	1			
Q1503876-02	Chloride	CCV		Soil	5.04 mg/L	g	5.04 mg/L	1			
Q1503876-02	Chloride	CCV		Soil	5.04 mg/L	g	5.04 mg/L	1			
Q1503876-02	Sulfate	CCV		Soil	5.07 mg/L	g	5.07 mg/L	1			
Q1503876-02	Sulfate	CCV		Soil	5.07 mg/L	g	5.07 mg/L	1			
Q1503876-03	Chloride	CCV		Soil	5.07 mg/L	g	5.07 mg/L	1			
Q1503876-03	Chloride	CCV		Soil	5.07 mg/L	g	5.07 mg/L	1			
Q1503876-03	Sulfate	CCV		Soil	5.06 mg/L	g	5.06 mg/L	1			
Q1503876-03	Sulfate	CCV		Soil	5.06 mg/L	g	5.06 mg/L	1			
Q1503876-04	Chloride	CCB		Soil	0.00 mg/L	g	2.0 mg/Kg U	1		2.0	
Q1503876-04	Chloride	CCB		Soil	0.00 mg/L	g	2.0 mg/Kg U	1	0.5	2.0	
Q1503876-04	Sulfate	CCB		Soil	0.00 mg/L	g	1.0 mg/Kg U	1		1.0	
Q1503876-04	Sulfate	CCB		Soil	0.00 mg/L	g	2.0 mg/Kg U	1	0.5	2.0	
Q1503876-05	Chloride	CCB		Soil	0.00 mg/L	g	2.0 mg/Kg U	1		2.0	
Q1503876-05	Chloride	CCB		Soil	0.00 mg/L	g	2.0 mg/Kg U	1	0.5	2.0	
Q1503876-05	Sulfate	CCB		Soil	0.00 mg/L	g	1.0 mg/Kg U	1		1.0	
Q1503876-05	Sulfate	CCB		Soil	0.00 mg/L	g	2.0 mg/Kg U	1	0.5	2.0	
Q1503876-06	Chloride	CCB		Soil	0.00 mg/L	g	2.0 mg/Kg U	1		2.0	
Q1503876-06	Chloride	CCB		Soil	0.00 mg/L	g	2.0 mg/Kg U	1	0.5	2.0	
Q1503876-06	Sulfate	CCB		Soil	0.00 mg/L	g	1.0 mg/Kg U	1		1.0	
Q1503876-06	Sulfate	CCB		Soil	0.00 mg/L	g	2.0 mg/Kg U	1	0.5	2.0	

ndicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Sequence: IC07042015
Operator: ALKLS.ALKLSXP305
Printed: 4/20/2015 4:13:24 PM

Title:
Datasource: ACQWET18_local
Location: K-IC-07\AUDIT
Timebase: K-IC-07
#Samples: 30

Created: 4/20/2015 10:38:43 AM by ALKLS.ALKLSXP305
Last Update: 4/20/2015 3:44:05 PM by ALKLS.ALKLSXP305

No.	Name	Type	Pos.	Inj. Vol.	Program	Method	Status	Inj. Date/Time	Weight
1	STD2/LVL2	Standard	1	25.0	300	300	Finished	1/5/2015 1:24:11 PM	1.0000
2	STD3/LVL3	Standard	2	25.0	300	300	Finished	1/5/2015 1:33:41 PM	1.0000
3	STD4/LVL4	Standard	3	25.0	300	300	Finished	1/5/2015 1:43:16 PM	1.0000
4	STD5/LVL5	Standard	4	25.0	300	300	Finished	1/5/2015 1:52:51 PM	1.0000
5	STD6/LVL6	Standard	5	25.0	300	300	Finished	1/5/2015 2:02:26 PM	1.0000
6	STD7/LVL7	Standard	6	25.0	300	300	Finished	1/5/2015 2:12:02 PM	1.0000
7	STD8/LVL8	Standard	7	25.0	300	300	Finished	1/5/2015 2:21:37 PM	1.0000
8	STD1/LVL1	Standard	8	25.0	300	300	Finished	1/5/2015 2:31:12 PM	1.0000
9	CCV1	Unknown	48	25.0	300	300	Finished	4/20/2015 11:08:01 AM	1.0000
10	CCB1	Unknown	49	25.0	300	300	Finished	4/20/2015 11:18:01 AM	1.0000
11	MB	Unknown	1	25.0	300	300	Finished	4/20/2015 11:28:04 AM	1.0000
12	LCS	Unknown	2	25.0	300	300	Finished	4/20/2015 11:37:55 AM	1.0000
13	MB DEXT	Unknown	4	25.0	300	300	Finished	4/20/2015 12:08:20 PM	1.0000
14	LCS EXT	Unknown	6	25.0	300	300	Finished	4/20/2015 1:30:55 PM	1.0000
15	K1503737-001	Unknown	9	25.0	300	300	Finished	4/20/2015 1:54:57 PM	1.0000
16	3737-1D	Unknown	10	25.0	300	300	Finished	4/20/2015 2:04:46 PM	1.0000
17	3737-1MS	Unknown	11	25.0	300	300	Finished	4/20/2015 2:14:24 PM	1.0000
18	3737-1MSD	Unknown	12	25.0	300	300	Finished	4/20/2015 2:23:59 PM	1.0000
19	K1503737-002	Unknown	13	25.0	300	300	Finished	4/20/2015 2:33:35 PM	1.0000
20	RB	Unknown	50	25.0	300	300	Finished	4/20/2015 2:43:10 PM	1.0000
21	CCV2	Unknown	48	25.0	300	300	Finished	4/20/2015 2:52:50 PM	1.0000
22	CCB2	Unknown	49	25.0	300	300	Finished	4/20/2015 3:02:58 PM	1.0000
23	3521-1	Unknown	14	25.0	300	300	Finished	4/20/2015 3:13:15 PM	1.0000
24	3522-1	Unknown	15	25.0	300	300	Finished	4/20/2015 3:23:04 PM	1.0000
25	K1503652-001	Unknown	16	25.0	300	300	Finished	4/20/2015 3:32:40 PM	1.0000
26	K1503521-001	Unknown	17	25.0	300	300	Finished	4/20/2015 3:42:15 PM	1.0000
27	K1503522-001	Unknown	18	25.0	300	300	Finished	4/20/2015 3:51:50 PM	1.0000
28	RB	Unknown	50	25.0	300	300	Finished	4/20/2015 4:01:25 PM	1.0000
[redacted]	CCV3	Unknown	48	25.0	300	300	Running	4/20/2015 4:11:18 PM	1.0000
30	CCB3	Unknown	49	25.0	300	300	Single		1.0000

Sequence: IC07042015
Operator: ALKLS.ALKLSXP305

Title:
Datasource: ACQWET18_local
Location: K-IC-07\AUDIT
Timebase: K-IC-07
#Samples: 30

Created: 4/20/2015 10:38:43 AM by ALKLS.ALKLSXP305
Last Update: 4/20/2015 3:44:05 PM by ALKLS.ALKLSXP305

No.	Name	Dil. Factor	Comment
1	STD2/LVL2	1.0000	
2	STD3/LVL3	1.0000	
3	STD4/LVL4	1.0000	
4	STD5/LVL5	1.0000	
5	STD6/LVL6	1.0000	
6	STD7/LVL7	1.0000	
7	STD8/LVL8	1.0000	
8	STD1/LVL1	1.0000	
9	CCV1	1.0000	
10	CCB1	1.0000	
11	MB	1.0000	
12	LCS	1.0000	
13	MB DEXT	1.0000	
14	LCS EXT	10.0000	
15	K1503737-001	100.0000	
16	3737-1D	100.0000	
17	3737-1MS	200.0000	
18	3737-1MSD	200.0000	
19	K1503737-002	100.0000	
20	RB	1.0000	
21	CCV2	1.0000	CCV2
22	CCB2	1.0000	CCB2
23	3521-1	50.0000	
24	3522-1	20.0000	
25	K1503652-001	50.0000	
26	K1503521-001	2.0000	
27	K1503522-001	5.0000	
28	RB	1.0000	
[redacted]	CCV3	1.0000	CCV3
30	CCB3	1.0000	CCB3

ork Order #.: _____ Method: _____

alysis: _____ PR# 233963

Date Prepared	Sample Name / Lab Code	Initial Wt./Vol. (g) or (ml)	Final Volume (ml)	mg/L (in solution)	mg/L - mg/kg As Rec'd	% Solids	mg/kg Dry Wt.
30.15	MB	2.500	25.0				
	LCS	1.000	10.0				
	3737-1	2.5303	25.0				
	-1d	2.5363					
	-1ms	2.5718					
	-1msd	2.5722					
	-2	2.5263					
	3521-1	2.5400					
	3522-1	2.5689					
	3652-1	2.6062					

4021-1 2x MS/MSD 5x
-21
-19
-20
-33 200x

3521-1 C1
-22 C1
3652-1 50x

Dup For EXT

3521-1 ~~2~~
3522-1 ~~5~~

441229

MS=
MSD=

X=
PD=

TD ID # = Anions in Soil Lot# D083-543 Cl T.V.: 374
Comments: SO4 T.V: 330

Prepared By:	B. Kettle	Date Prepared:	4.20.15 11:30
Analyzed By:	B. Kettle	Date Analyzed:	4.20.15
Reviewed By:	✓	Date Reviewed:	4/21/15

Preparation Information Benchsheet

Prep Run#: 233963
Team: GenChem/BHETLAND
Number of Copies to make: 4

Prep WorkFlow: GenExt28Day
Prep Method: Method

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Final Vol	Samp
1	KQ1503869-01	MB		300.0/Chloride		Solid	2.5000g	25.00mL	
2	KQ1503869-01	MB		300.0/SO4		Solid	2.5000g	25.00mL	
3	KQ1503869-01	MB		9056A/Chloride		Solid	2.5000g	25.00mL	
4	KQ1503869-01	MB		9056A/SO4		Solid	2.5000g	25.00mL	
5	KQ1503869-02	LCS		300.0/Chloride		Solid	1.0000g	10.00mL	
6	KQ1503869-02	LCS		300.0/SO4		Solid	1.0000g	10.00mL	
7	KQ1503869-02	LCS		9056A/Chloride		Solid	1.0000g	10.00mL	
8	KQ1503869-02	LCS		9056A/SO4		Solid	1.0000g	10.00mL	
9	K1503737-001	Louisiana Soil - 1	.01	300.0/Chloride		Soil	2.5303g	25.00mL	
10	K1503737-001	Louisiana Soil - 1	.01	300.0/SO4		Soil	2.5303g	25.00mL	
11	KQ1503869-09	K1503737-001 DUP	.01	300.0/Chloride		Solid	2.5363g	25.00mL	
12	KQ1503869-09	K1503737-001 DUP	.01	300.0/SO4		Solid	2.5363g	25.00mL	
13	KQ1503869-07	K1503737-001 MS	.01	300.0/Chloride		Solid	2.5718g	25.00mL	
14	KQ1503869-07	K1503737-001 MS	.01	300.0/SO4		Solid	2.5718g	25.00mL	
15	KQ1503869-08	K1503737-001 DMS	.01	300.0/Chloride		Solid	2.5722g	25.00mL	
16	KQ1503869-08	K1503737-001 DMS	.01	300.0/SO4		Solid	2.5722g	25.00mL	
17	KQ1503869-03	Batch QC		300.0/Chloride		Soil	2.5303g	25.00mL	
18	KQ1503869-03	Batch QC		300.0/SO4		Soil	2.5303g	25.00mL	
19	KQ1503869-03	Batch QC		9056A/Chloride		Soil	2.5303g	25.00mL	
20	KQ1503869-03	Batch QC		9056A/SO4		Soil	2.5303g	25.00mL	
21	KQ1503869-06	KQ1503869-03 DUP		300.0/Chloride		Solid	2.5363g	25.00mL	
22	KQ1503869-06	KQ1503869-03 DUP		300.0/SO4		Solid	2.5363g	25.00mL	
23	KQ1503869-06	KQ1503869-03 DUP		9056A/Chloride		Solid	2.5363g	25.00mL	
24	KQ1503869-06	KQ1503869-03 DUP		9056A/SO4		Solid	2.5363g	25.00mL	
25	KQ1503869-04	KQ1503869-03 MS		300.0/Chloride		Solid	2.5718g	25.00mL	
26	KQ1503869-04	KQ1503869-03 MS		300.0/SO4		Solid	2.5718g	25.00mL	
27	KQ1503869-04	KQ1503869-03 MS		9056A/Chloride		Solid	2.5718g	25.00mL	
28	KQ1503869-04	KQ1503869-03 MS		9056A/SO4		Solid	2.5718g	25.00mL	
29	KQ1503869-05	KQ1503869-03 DMS		300.0/Chloride		Solid	2.5722g	25.00mL	
30	KQ1503869-05	KQ1503869-03 DMS		300.0/SO4		Solid	2.5722g	25.00mL	
31	KQ1503869-05	KQ1503869-03 DMS		9056A/Chloride		Solid	2.5722g	25.00mL	
32	KQ1503869-05	KQ1503869-03 DMS		9056A/SO4		Solid	2.5722g	25.00mL	
33	K1503737-002	Louisiana Soil - 2	.01	300.0/Chloride		Soil	2.5263g	25.00mL	
34	K1503737-002	Louisiana Soil - 2	.01	300.0/SO4		Soil	2.5263g	25.00mL	

Preparation Information Benchsheet

Prep Ruu#: 233963 **Prep WorkFlow:** GenExt28Day
Team: GenChem/BHETLAND **Prep Method:** Method

35	K1503521-001	WP-032415-W	.01	300.0/Chloride		Soil	2.5400g	25.00mL	
36	K1503522-001	East Pond	.01	9056A/Chloride		Soil	2.5689g	25.00mL	
37	K1503652-001	COR BIOSOLIDS ROW 4-7-15	.01	9056A/SO4		Biosolids Solids	2.6062g	25.00mL	

Spiking Solutions

Name: Potassium Chloride 10,000 ppm Cl KCl Inventory ID 26683 Logbook Ref: AN1-34-H

KQ1503869-04	1.00mL	KQ1503869-04	1.00mL	KQ1503869-04	1.00mL	KQ1503869-04	1.00mL	KQ1503869-05	1.0(
KQ1503869-05	1.00mL	KQ1503869-05	1.00mL	KQ1503869-07	1.00mL	KQ1503869-07	1.00mL	KQ1503869-08	1.0(

Name: Potassium Sulfate 10 mg/mL SO4 10,000 ppm K2S Inventory ID 26684 Logbook Ref: AN1-34-I

KQ1503869-04	1.00mL	KQ1503869-04	1.00mL	KQ1503869-04	1.00mL	KQ1503869-04	1.00mL	KQ1503869-05	1.0(
KQ1503869-05	1.00mL	KQ1503869-05	1.00mL	KQ1503869-07	1.00mL	KQ1503869-07	1.00mL	KQ1503869-08	1.0(

Name: Anions in soil, Cl F Br NO3 P SO4 Inventory ID 71139 Logbook Ref:

KQ1503869-02	1.00g	KQ1503869-02	1.00g	KQ1503869-02	1.00g	KQ1503869-02	1.00g

Preparation Steps

Step: Extraction
Started: 4/20/15 13:11
Finished: 4/20/15 13:20
By: BHETLAND
Comments

Comments: _____

Reviewed By: _____ Date: _____

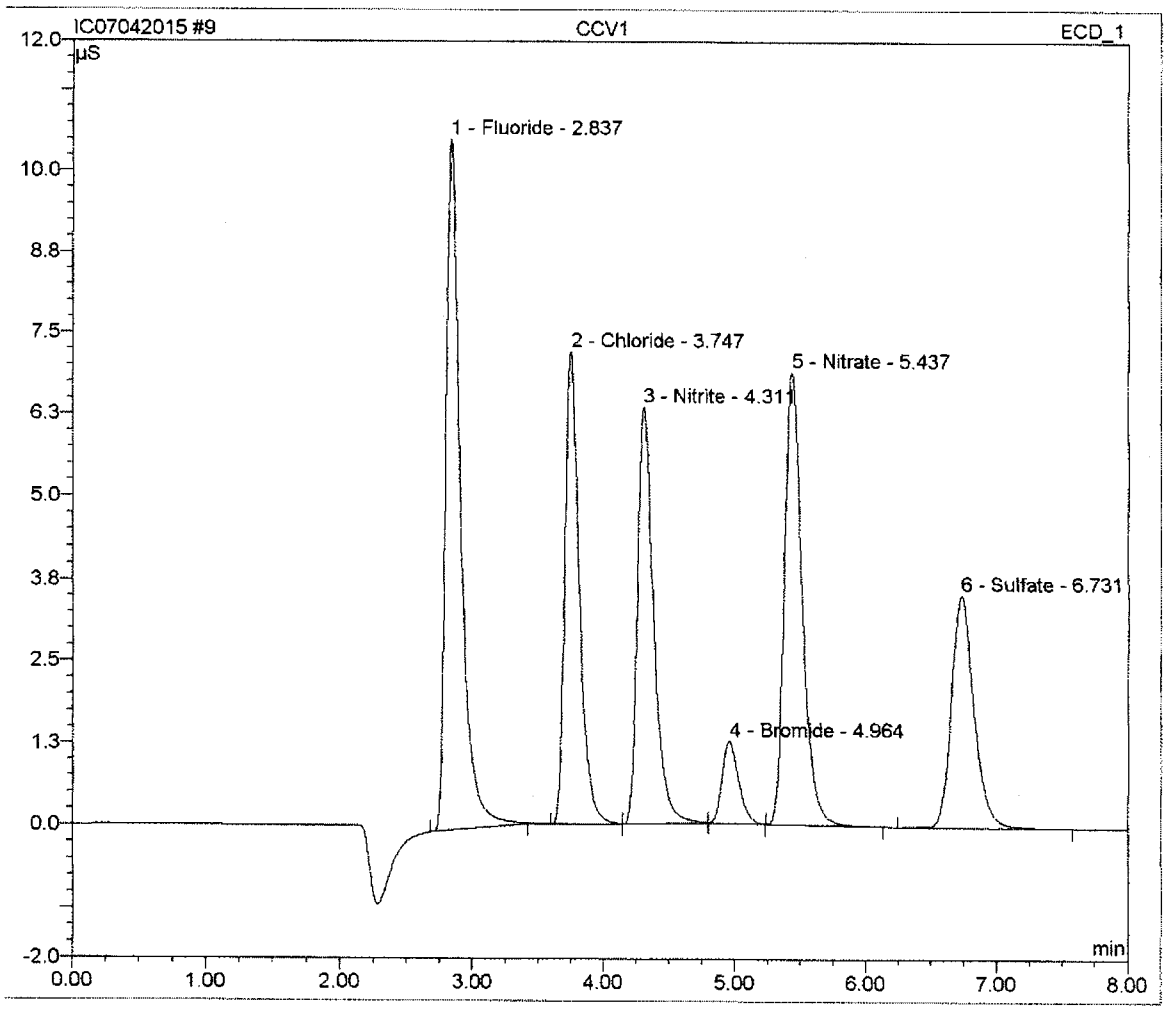
Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

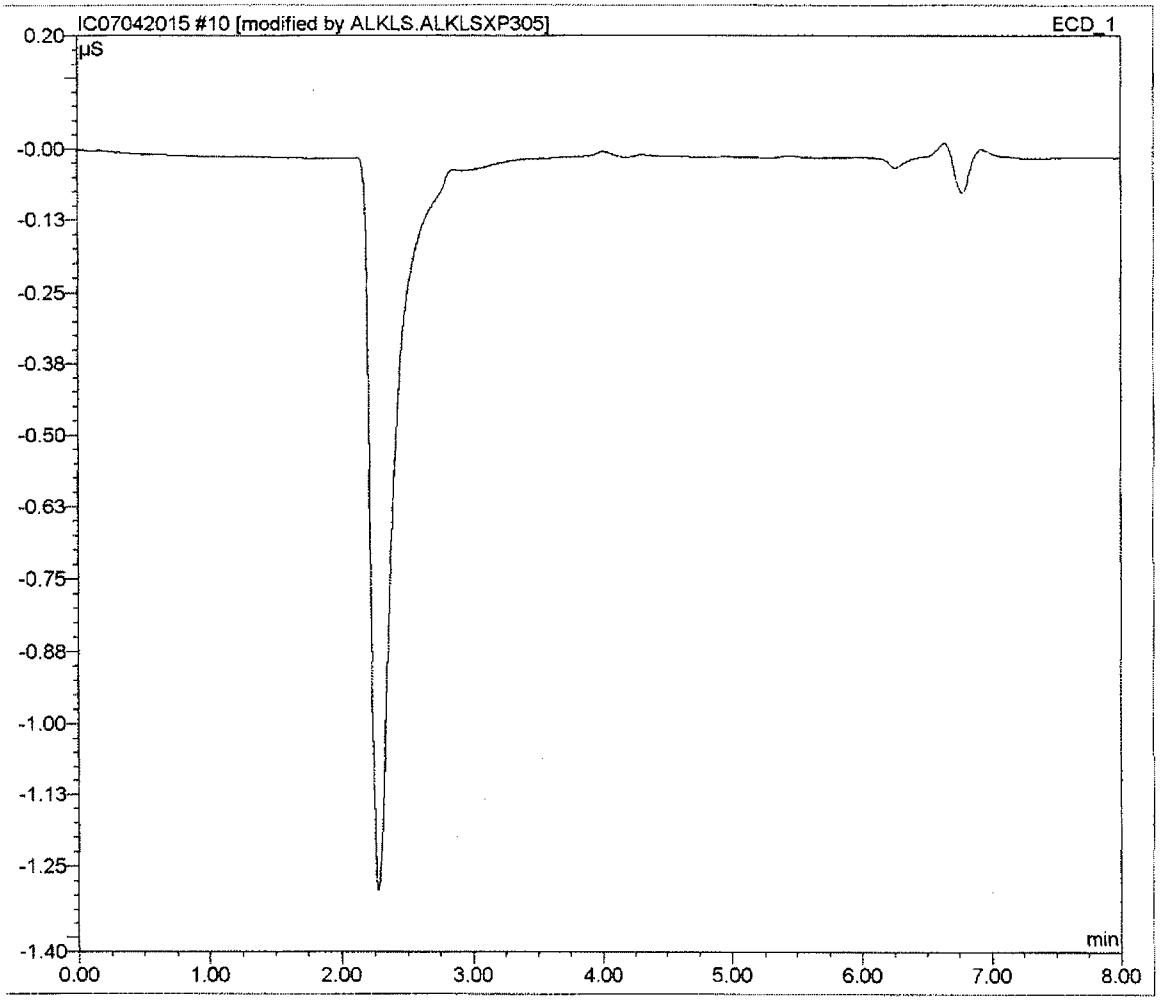
Sample Name:	**CCV1**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 11:08**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm	
1	2.84	Fluoride	BMB	1.359	10.571	5.0900	102
2	3.75	Chloride	BMB	0.918	7.192	5.0787	102
3	4.31	Nitrite	BMB	0.906	6.328	2.5085	100
4	4.96	Bromide	BMB	0.182	1.256	2.5547	102
5	5.44	Nitrate	BMB	1.087	6.872	2.4686	99
6	6.73	Sulfate	BMB	0.706	3.546	5.1539	103
			TOTAL:	5.16	35.76	22.85	



Sample Name:	**CCB1**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 11:18**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
		TOTAL:		0.00	0.00	0.00



After
Initials BW

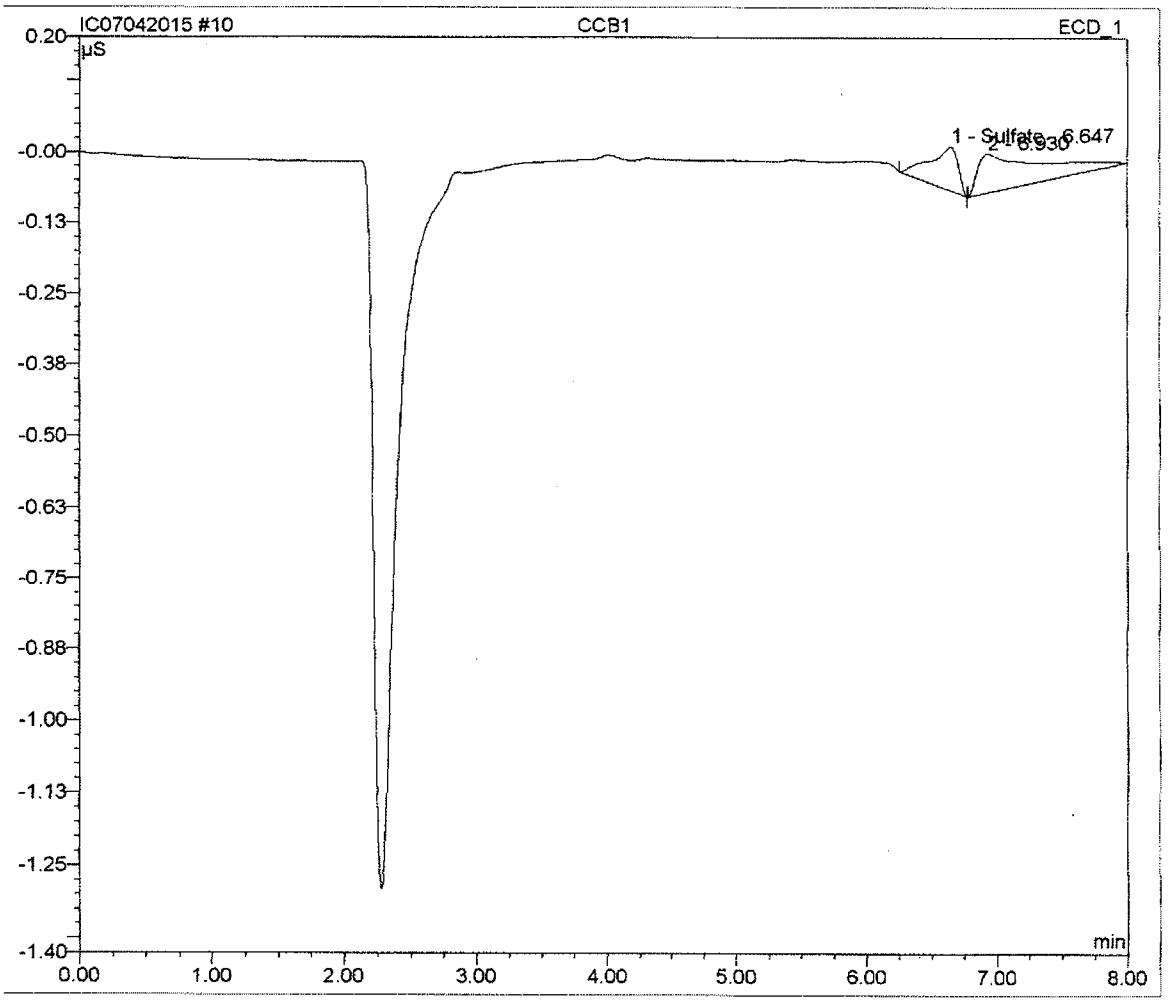
APR 20 2015

☐Wrong Peak/Peak not Found
☒Baseline/shoulder Incorrect
☐Other

4/21/15

Sample Name:	**CCB1**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 11:18**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	6.65	Sulfate	BMB	0.019	0.077	0.1391
		TOTAL:		0.02	0.08	0.14

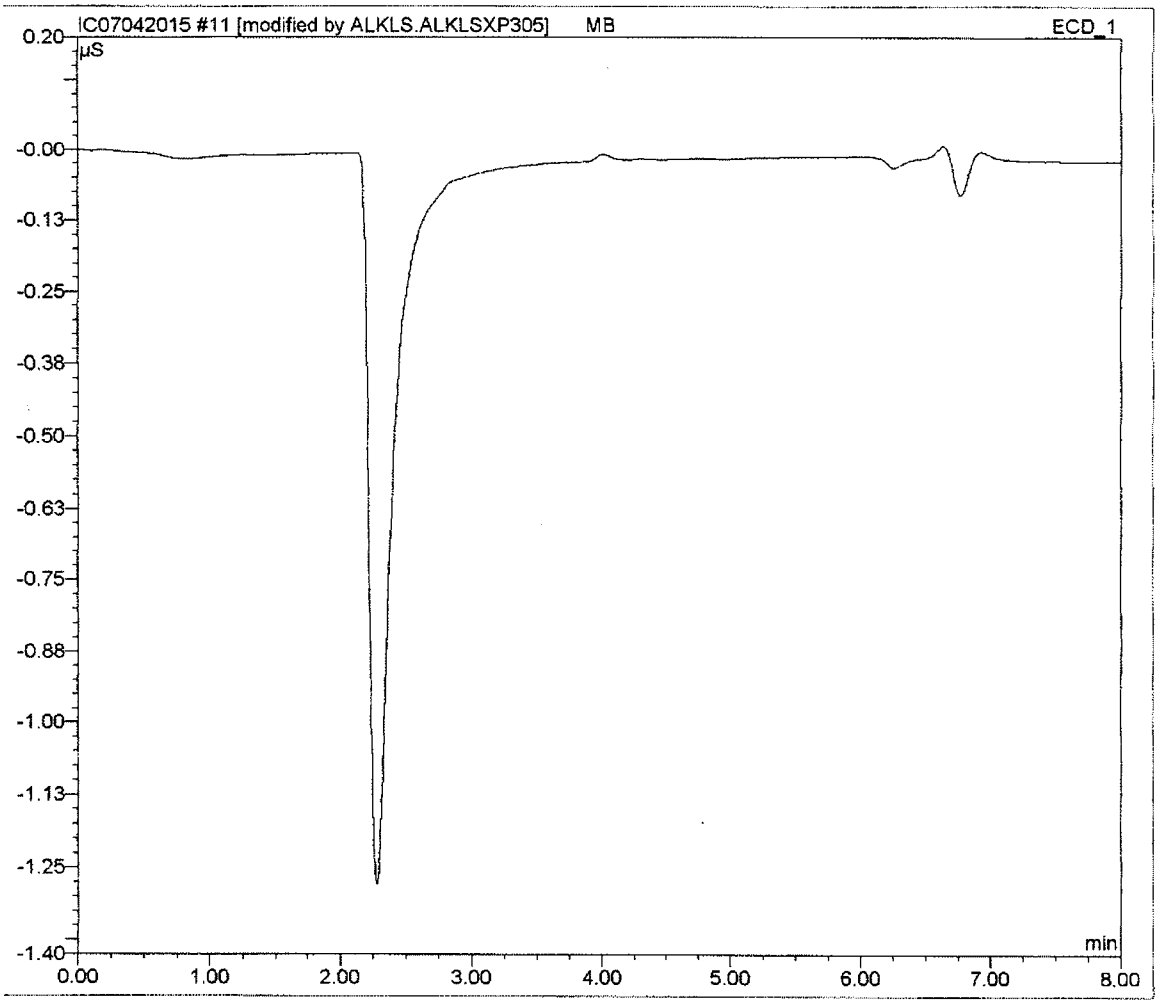


Before
GV
APR 20 2015

4/21/15

Sample Name:	MB	*Inj. Vol.:*	25.0
Sample Type:	unknown	*Dilution Factor:*	1.0000
Program:	300	*Operator:*	n.a.
Inj. Date/Time:	20/04/15 11:28	*Run Time:*	8.00

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
		TOTAL:		0.00	0.00	0.00



After
Initials GI

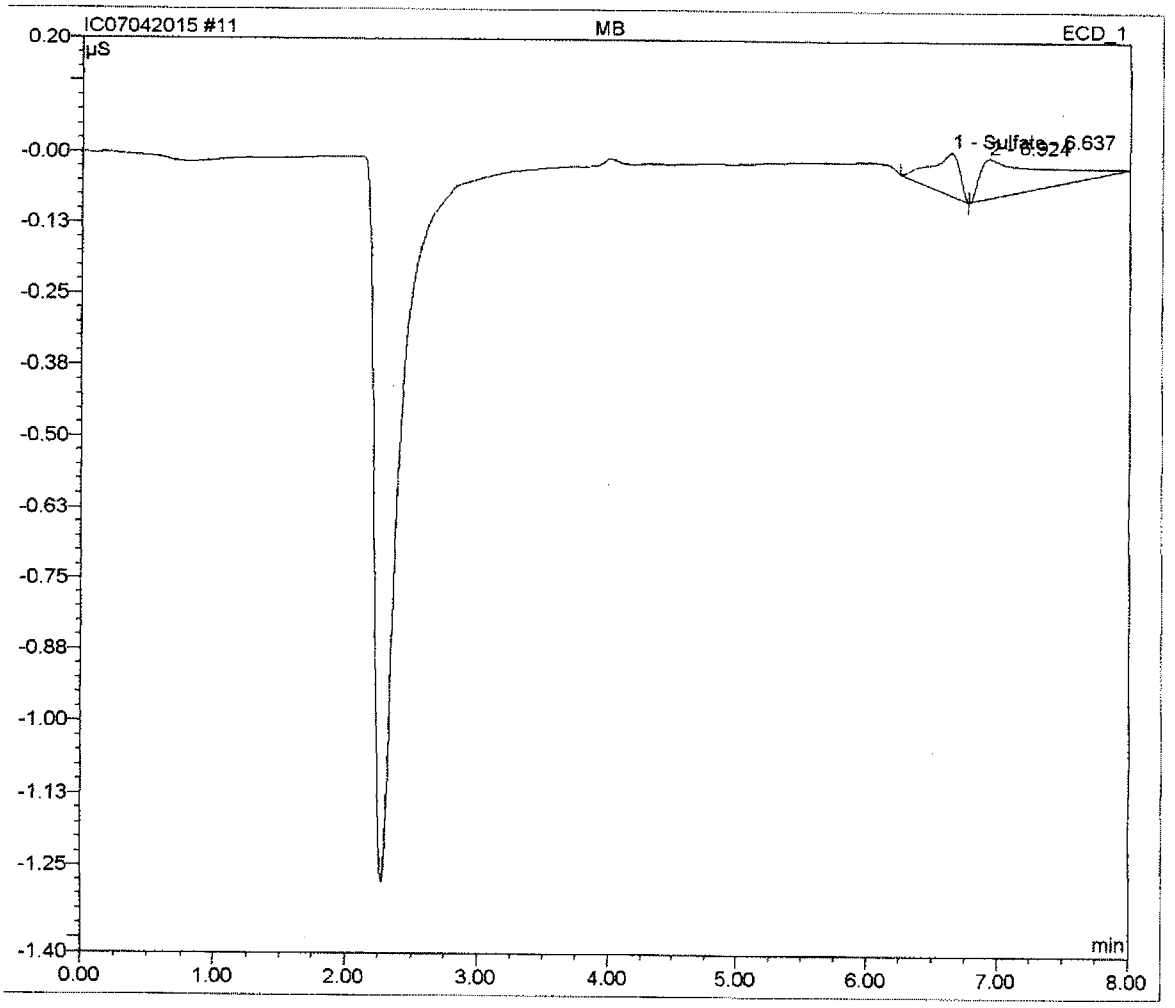
APR 20 2015

☐Wrong Peak/Peak not Found
☒Baseline/shoulder Incorrect
☐Other

4/21/15

Sample Name:	**MB**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 11:28**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	6.64	Sulfate	BMB	0.019	0.076	0.1384
		TOTAL:		0.02	0.08	0.14

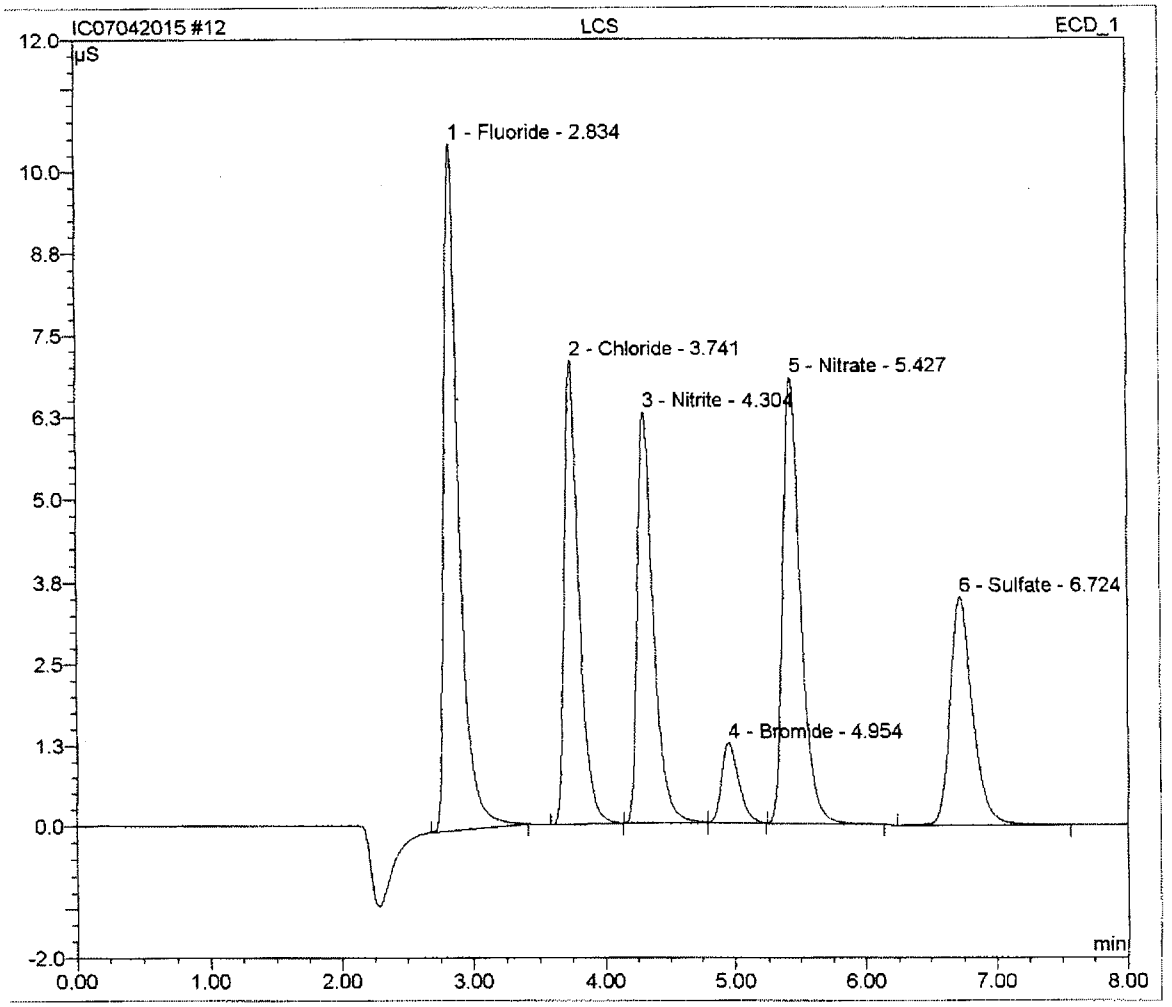


Before
APR 20 2015

4/21/15

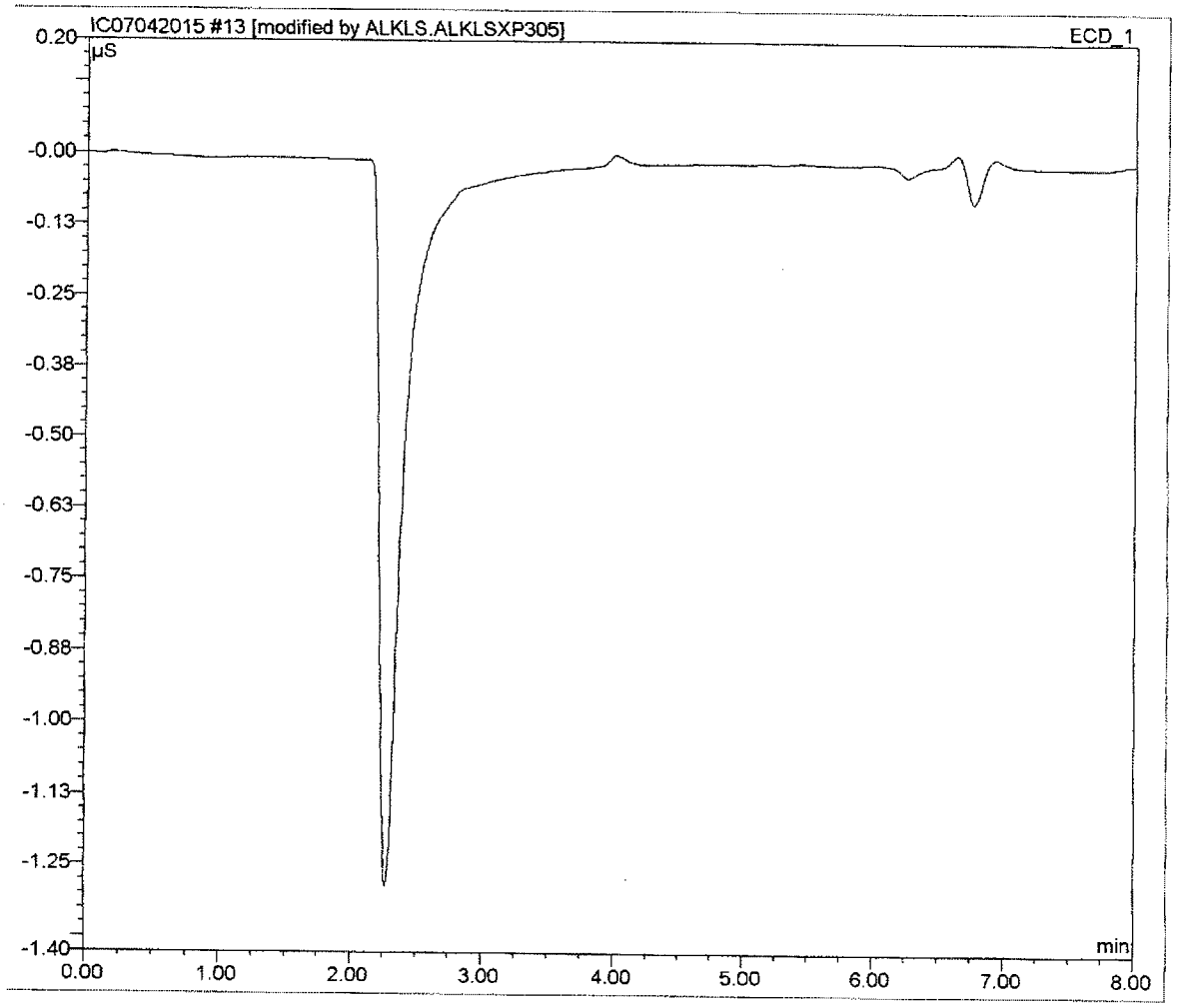
Sample Name:	**LCS**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 11:37**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.83	Fluoride	BMB	1.353	10.492	5.0665
2	3.74	Chloride	BMB	0.911	7.095	5.0431
3	4.30	Nitrite	BMB	0.903	6.284	2.4986
4	4.95	Bromide	BMB	0.183	1.248	2.5722
5	5.43	Nitrate	BMB	1.083	6.808	2.4597
6	6.72	Sulfate	BMB	0.701	3.522	5.1229
		TOTAL:		5.13	35.45	22.76



Sample Name:	**MB DEXT**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 12:08**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
		TOTAL:		0.00	0.00	0.00



After
Initials NV

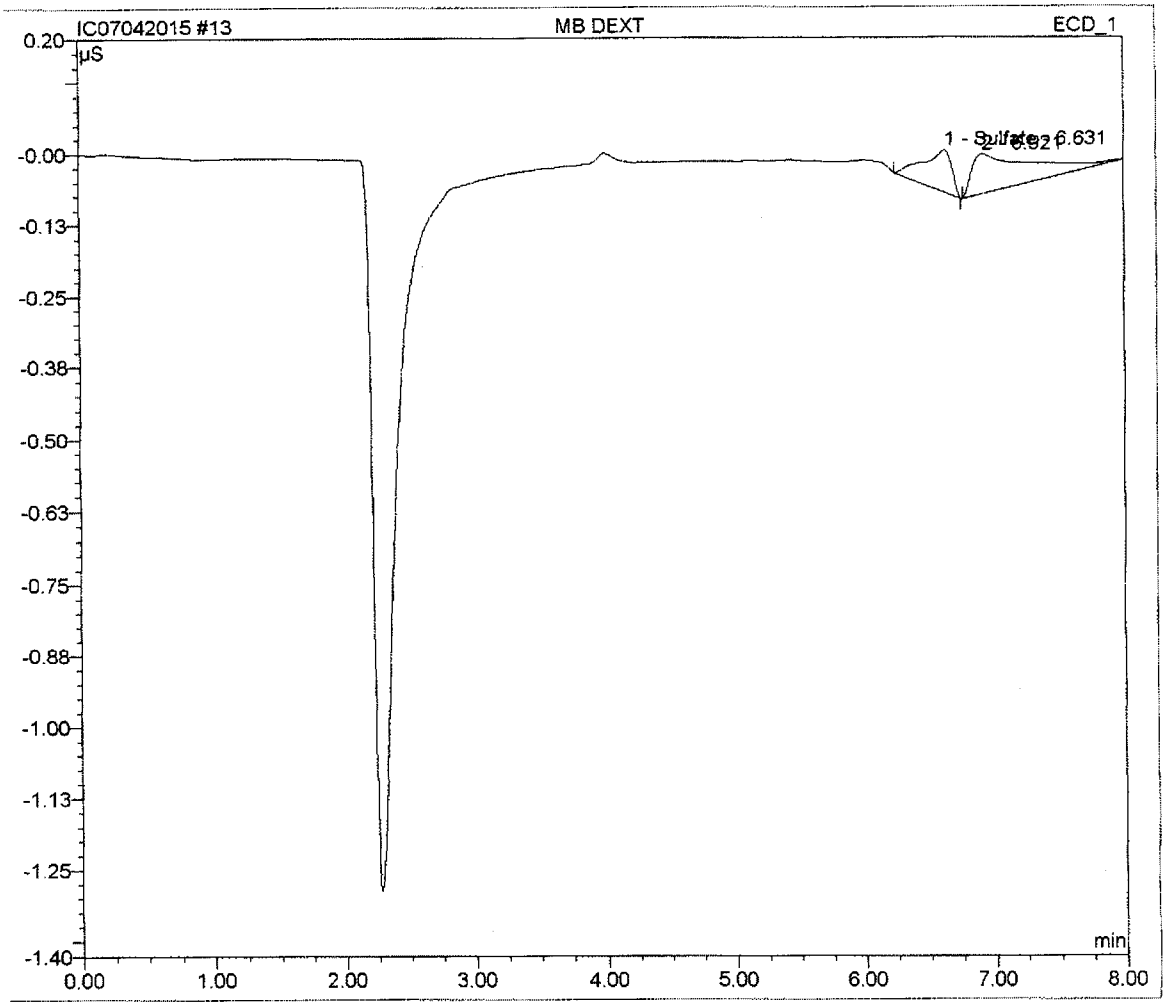
APR 20 2015

☐Wrong Peak/Peak not Found
☐Baseline/shoulder Incorrect
☐Other

HS 4/21/15

Sample Name:	**MB DEXT**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 12:08**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	6.63	Sulfate	BMB	0.019	0.074	0.1364
		TOTAL:		0.02	0.07	0.14

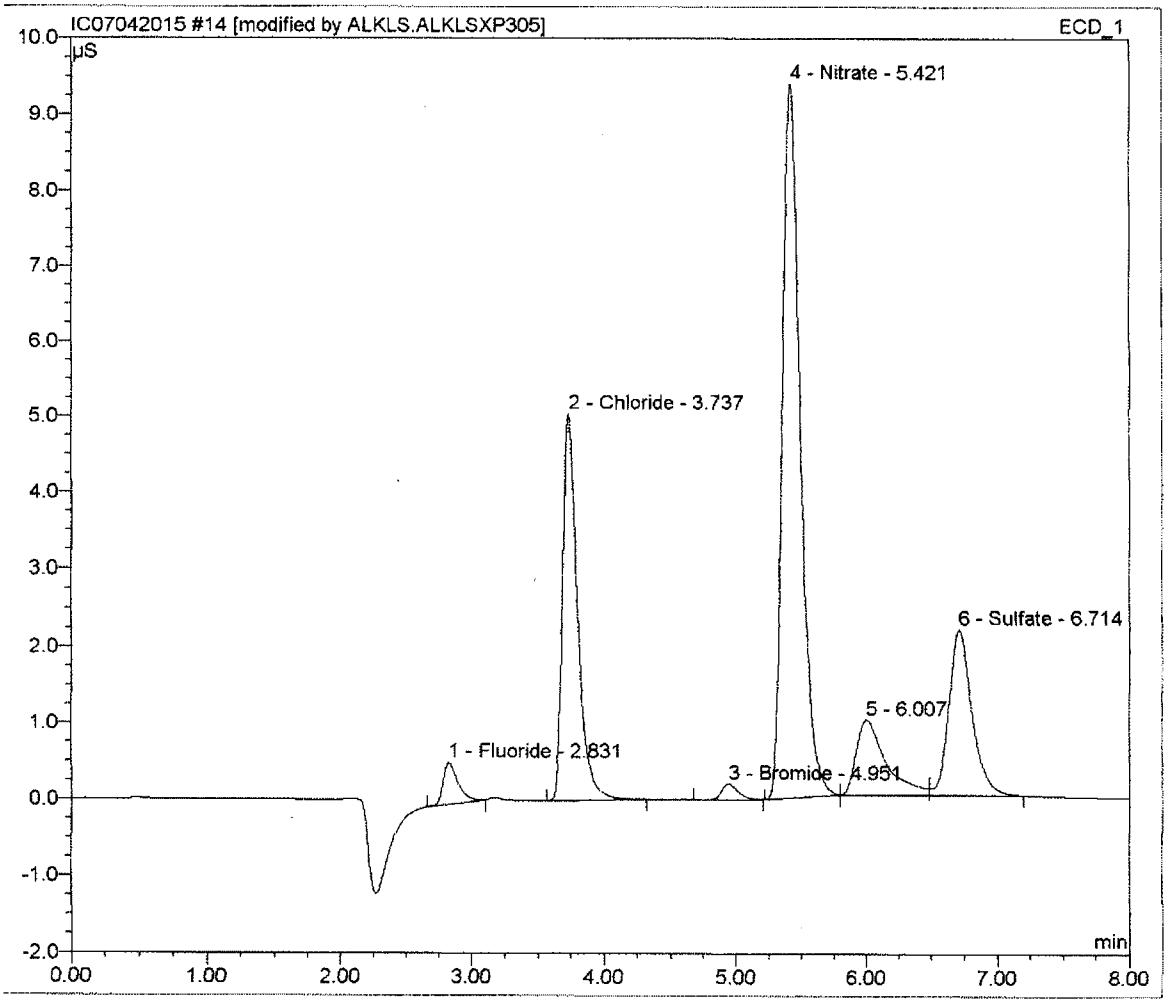


Before
APR 20 2015

4/21/15

Sample Name:	**LCS EXT**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**10.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 13:30**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.83	Fluoride	BMB	0.072	0.545	2.6867
2	3.74	Chloride	BMB	0.662	5.045	36.6436
3	4.95	Bromide	BMB	0.031	0.207	4.3009
4	5.42	Nitrate	BMb*	1.479	9.377	33.5965
6	6.71	Sulfate	MB*	0.443	2.179	32.3807
		TOTAL:		2.69	17.35	109.61



After
Initials bv

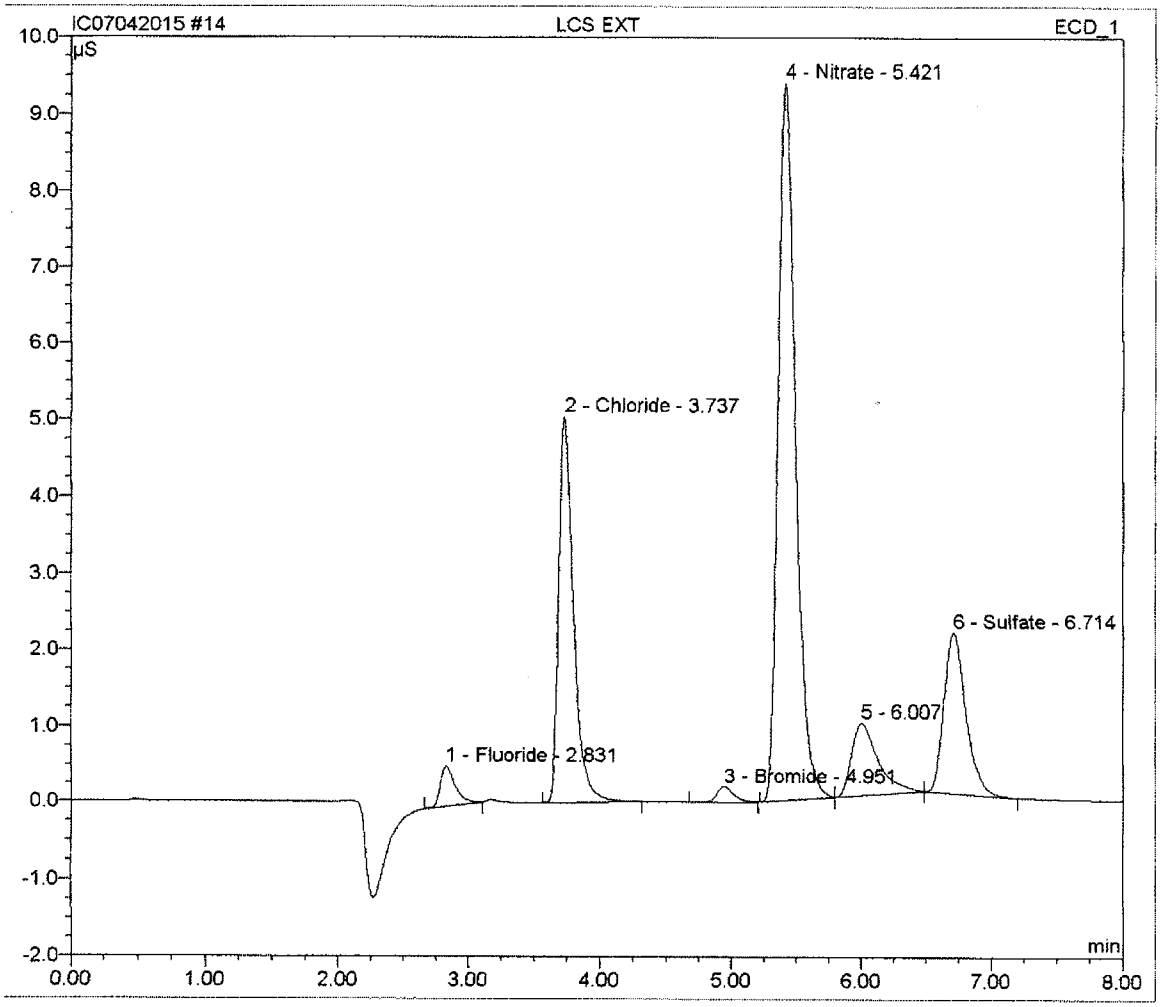
4/21/15

APR 20 2015

☐Wrong Peak/Peak not Found
☒Baseline/shoulder Incorrect
☐Other

Sample Name:	**LCS EXT**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**10.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 13:30**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.83	Fluoride	BMB	0.072	0.545	2.6867
2	3.74	Chloride	BMB	0.662	5.045	36.6436
3	4.95	Bromide	BMB	0.031	0.207	4.3009
4	5.42	Nitrate	BMB	1.479	9.377	33.5965
6	6.71	Sulfate	bMB	0.412	2.118	30.0650
		TOTAL:		2.65	17.29	107.29



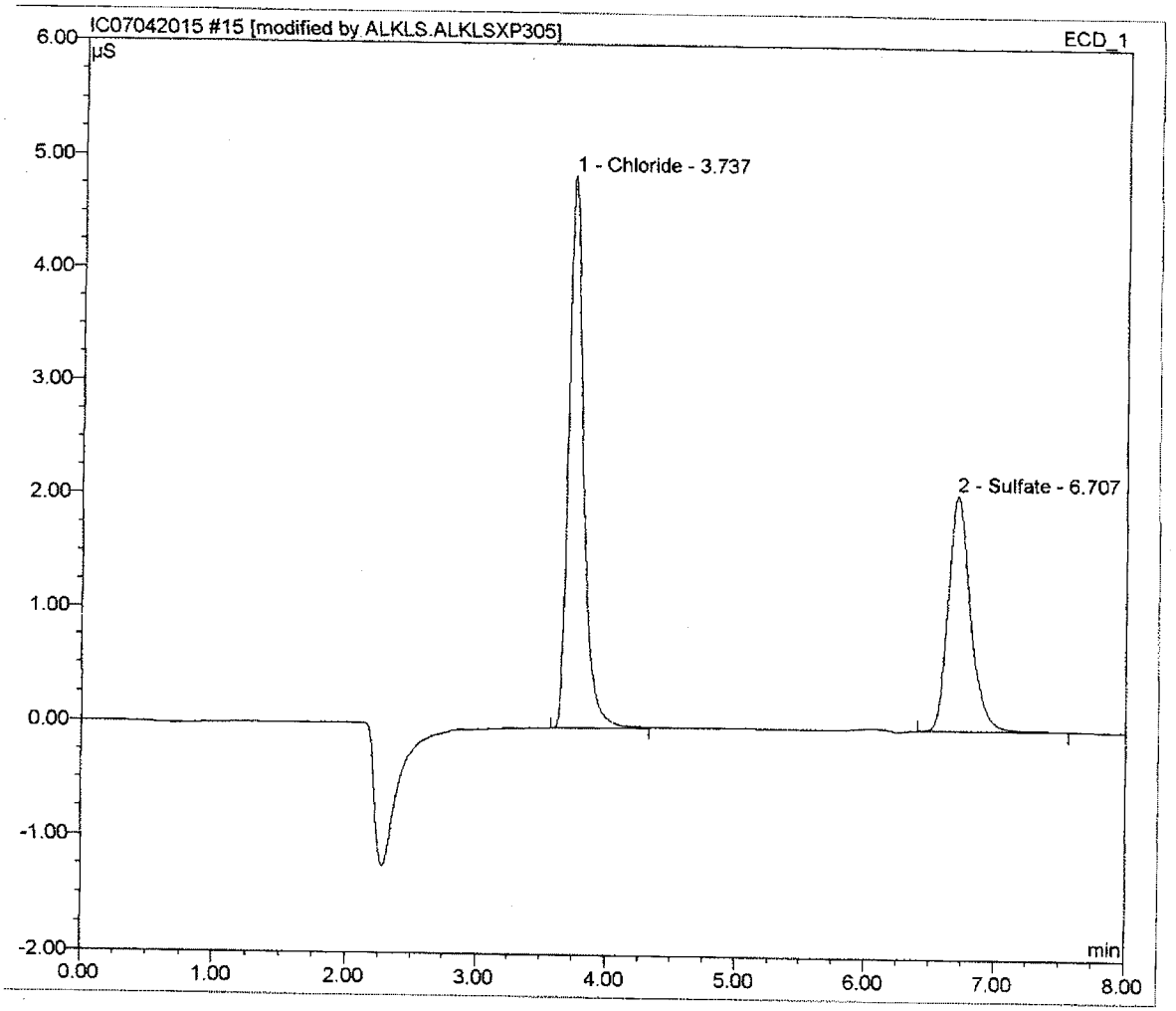
Before SV

APR 20 2015

4/20/15

Sample Name:	**K1503737-001**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**100.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 13:54**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.639	4.873	353.9283
2	6.71	Sulfate	BMB*	0.413	2.069	301.6883
		TOTAL:		1.05	6.94	655.62



After
Initials BV

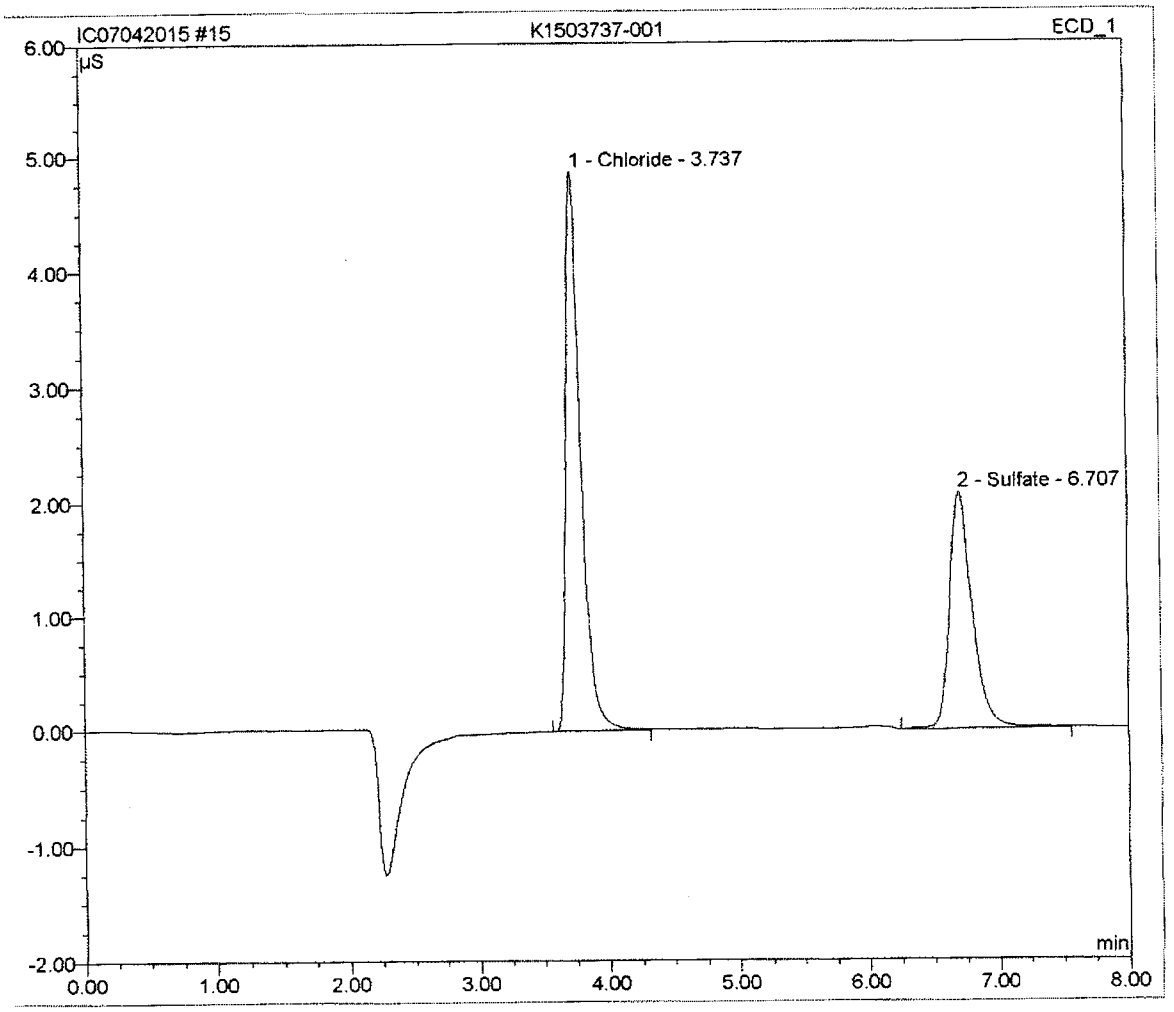
APR 20 2015

☐Wrong Peak/Peak not Found
☒Baseline/shoulder Incorrect
☐Other

4/21/15

Sample Name:	**K1503737-001**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**100.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 13:54**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.639	4.873	353.9283
2	6.71	Sulfate	BMB	0.422	2.078	308.0165
		TOTAL:		1.06	6.95	661.94

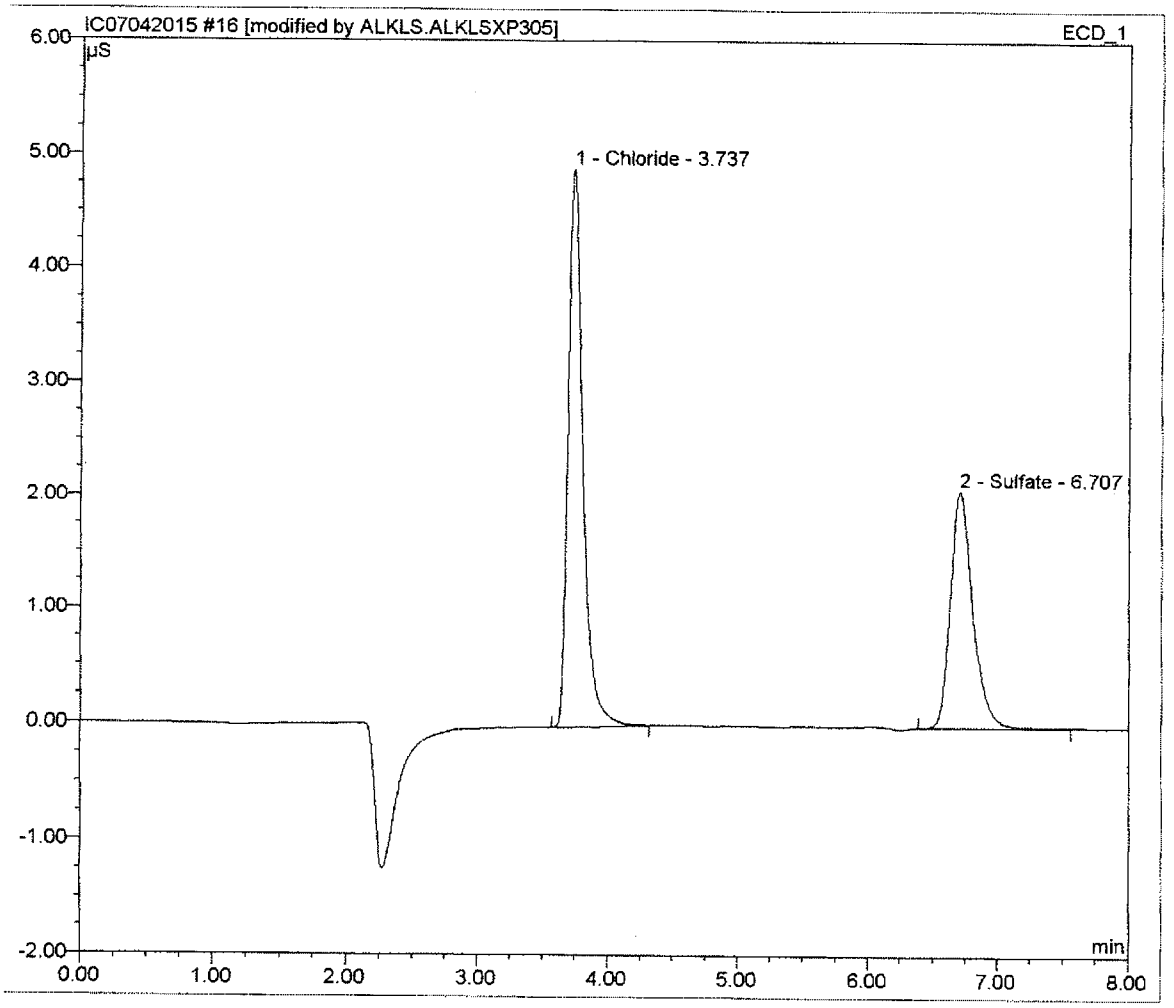


Before
APR 20 2015 bv

K 4/21/15

Sample Name:	**3737-1D**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**100.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:04**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.645	4.895	356.8063
2	6.71	Sulfate	BMB*	0.414	2.077	302.1748
		TOTAL:		1.06	6.97	658.98



After
Initials AI

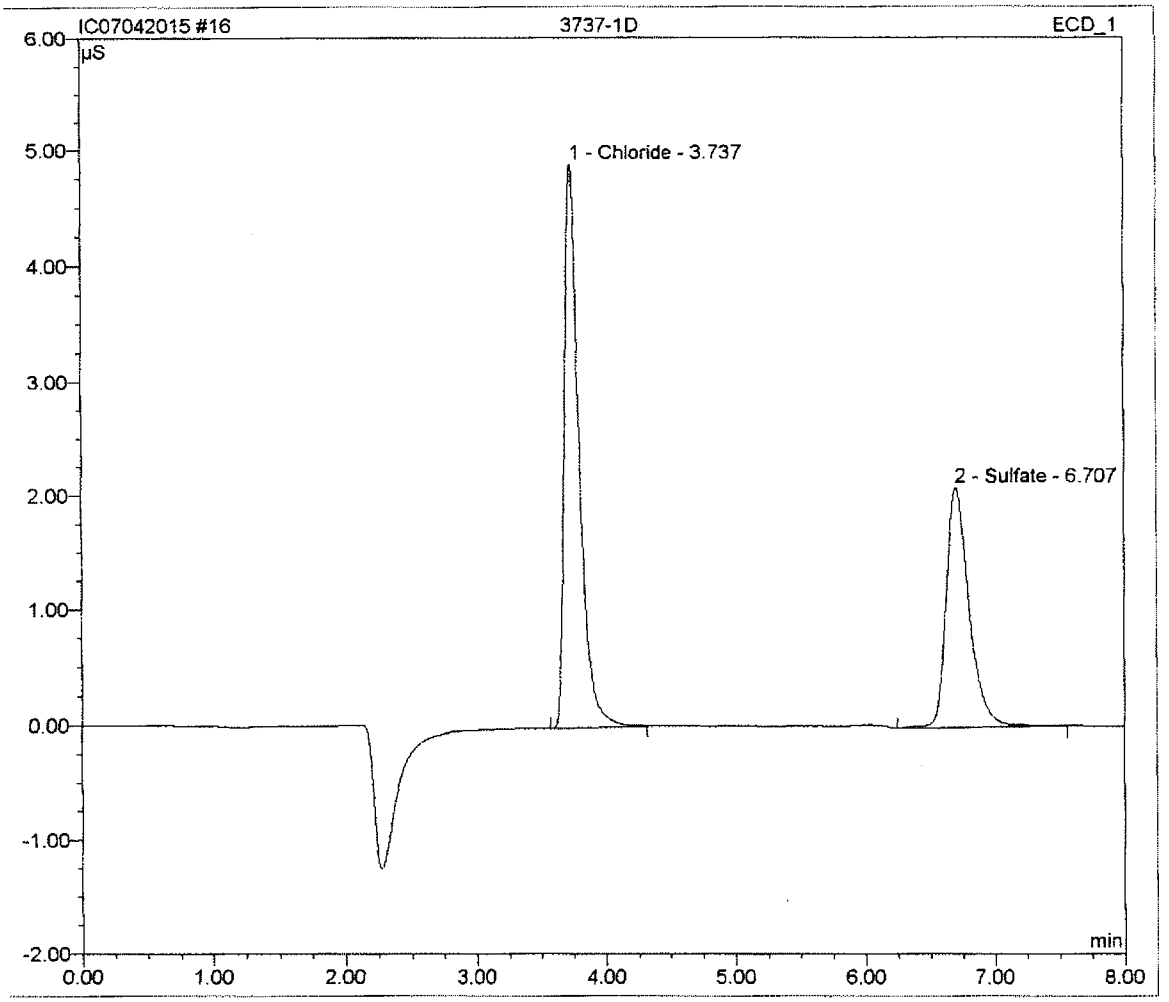
APR 20 2015

☐Wrong Peak/Peak not Found
☒Baseline/shoulder Incorrect
☐Other

4/21/15

Sample Name:	**3737-1D**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**100.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:04**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.645	4.895	356.8063
2	6.71	Sulfate	BMB	0.423	2.087	309.1926
		TOTAL:		1.07	6.98	666.00



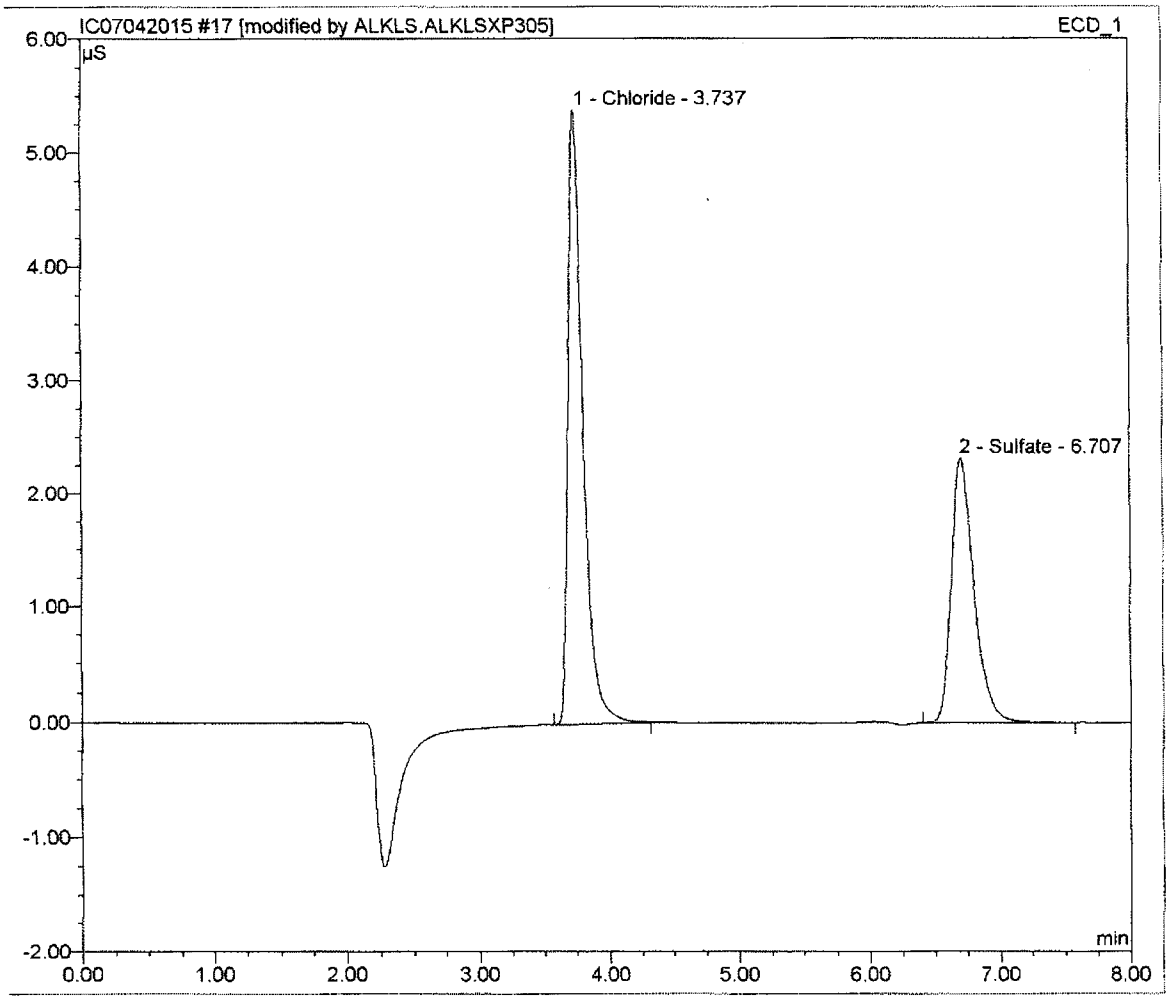
4/21/15

Before

APR 20 2015

Sample Name:	**3737-1MS**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**200.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:14**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.708	5.391	783.9879
2	6.71	Sulfate	BMB*	0.459	2.314	671.0601
		TOTAL:		1.17	7.71	1455.05



4/21/15

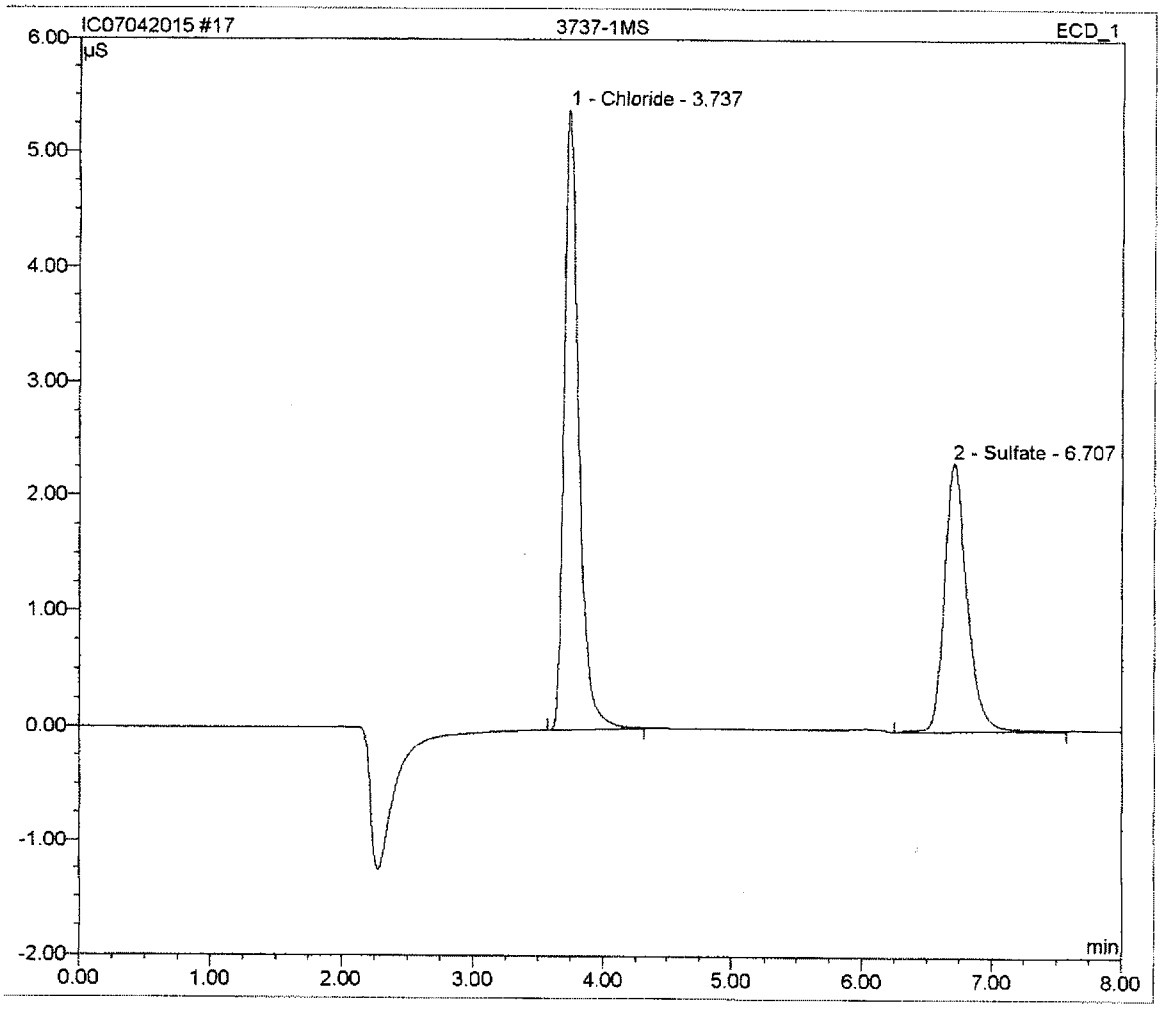
After
Initials bk

APR 20 2015

☐Wrong Peak/Peak not Found
☒Baseline/shoulder Incorrect
☐Other

Sample Name:	**3737-1MS**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**200.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:14**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.708	5.391	783.9879
2	6.71	Sulfate	BMB	0.470	2.326	686.2951
		TOTAL:		1.18	7.72	1470.28

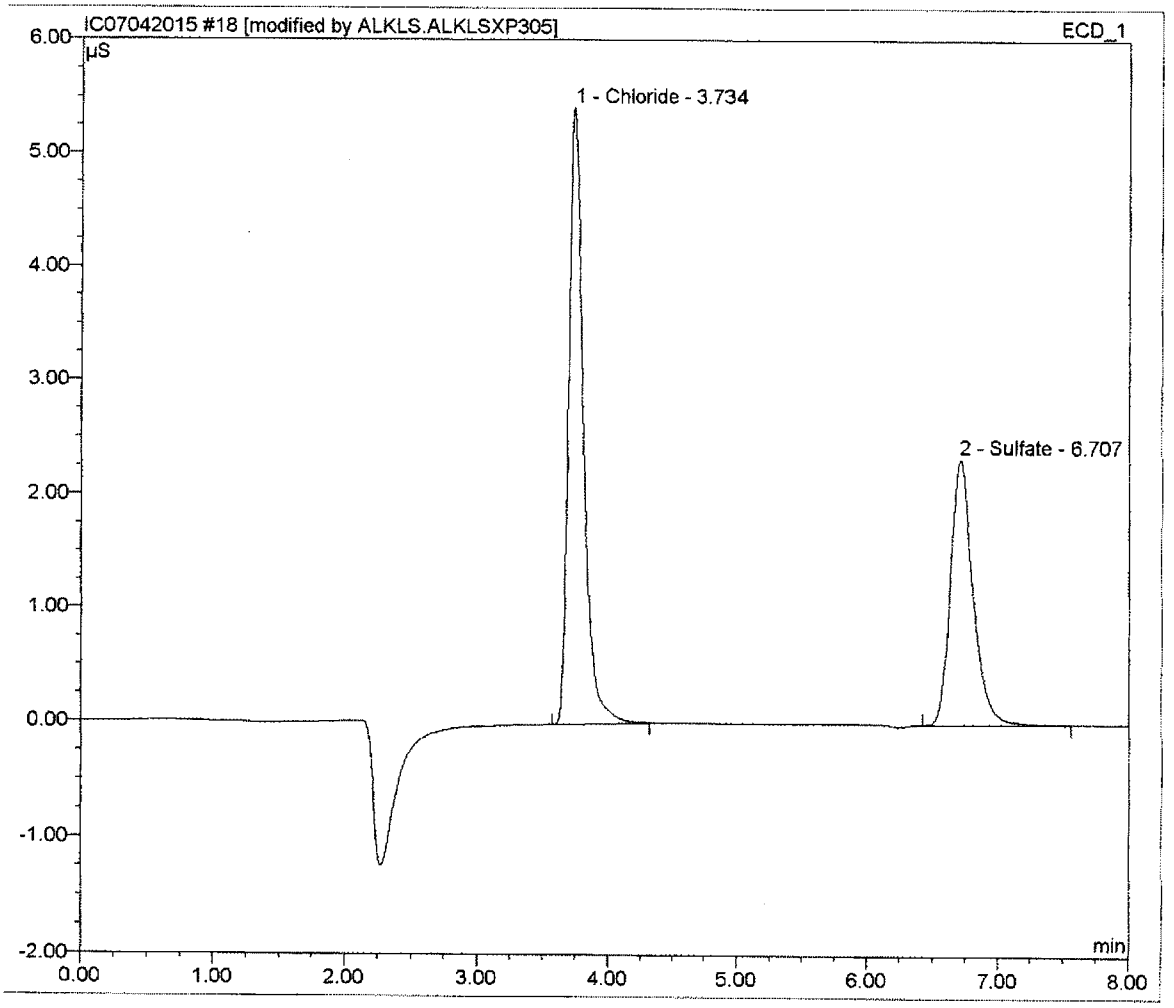


Before
APR 20 2015

4/21/15

Sample Name:	**3737-1MSD**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**200.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:23**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.73	Chloride	BMB	0.715	5.428	791.4052
2	6.71	Sulfate	BMB*	0.468	2.335	683.2711
		TOTAL:		1.18	7.76	1474.68



After
Initials W

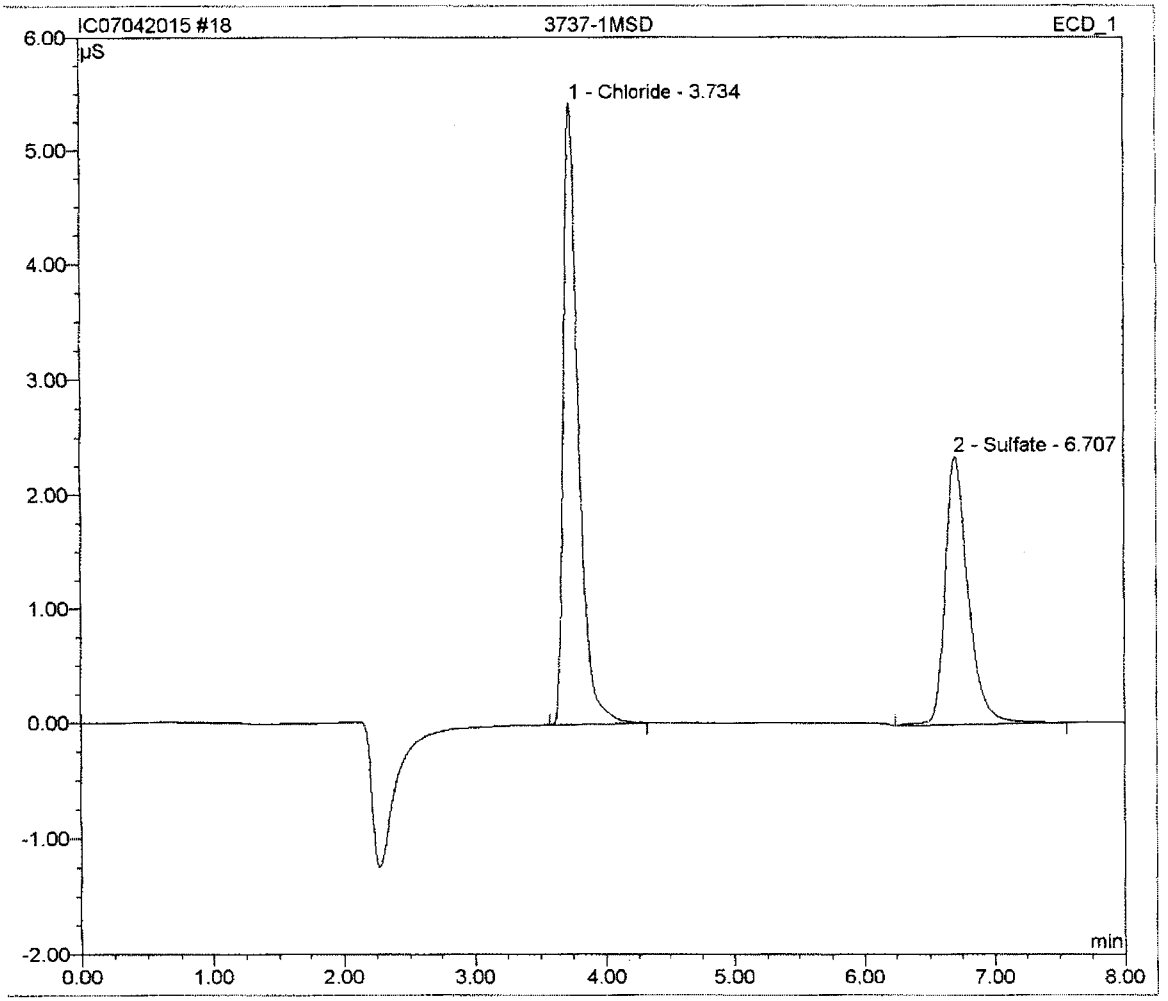
APR 20 2015

☐Wrong Peak/Peak not Found
☐Baseline/shoulder Incorrect
☐Other

4/21/15

Sample Name:	**3737-1MSD**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**200.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:23**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.73	Chloride	BMB	0.715	5.428	791.4052
2	6.71	Sulfate	BMB	0.480	2.348	700.6445
		TOTAL:		1.19	7.78	1492.05



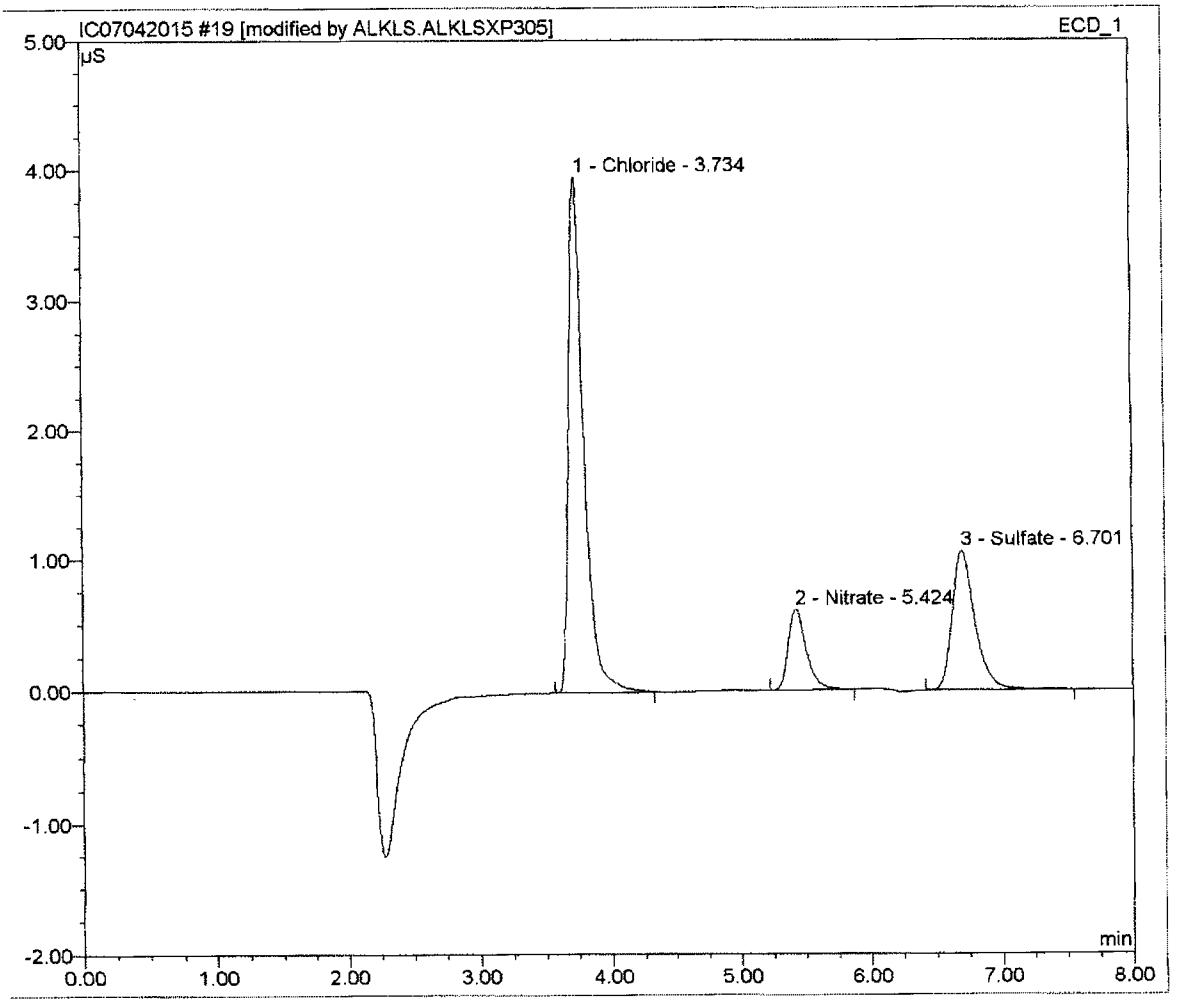
Before

APR 20 2015

4/21/15

Sample Name:	**K1503737-002**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**100.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:33**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.73	Chloride	BMB	0.528	3.959	292.3380
2	5.42	Nitrate	BMB	0.100	0.611	22.6342
3	6.70	Sulfate	BMB*	0.212	1.065	154.7404
		TOTAL:		0.84	5.64	469.71



After
Initials br

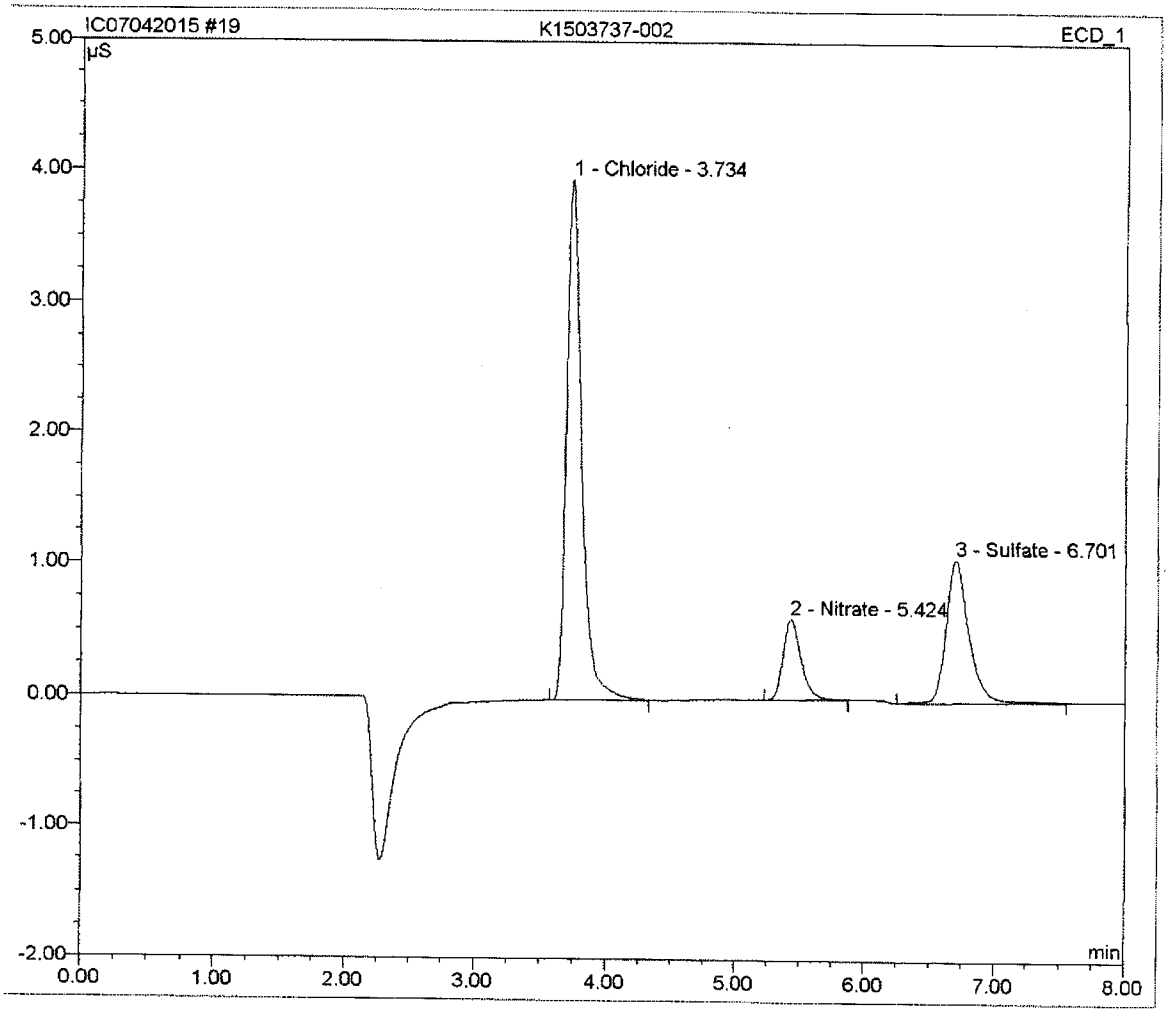
APR 20 2015

☐ Wrong Peak/Peak not Found
☒ Baseline/shoulder Incorrect
☐ Other

4/21/15

Sample Name:	**K1503737-002**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**100.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:33**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.73	Chloride	BMB	0.528	3.959	292.3380
2	5.42	Nitrate	BMB	0.100	0.611	22.6342
3	6.70	Sulfate	BMB	0.220	1.074	160.4982
		TOTAL:		0.85	5.64	475.47



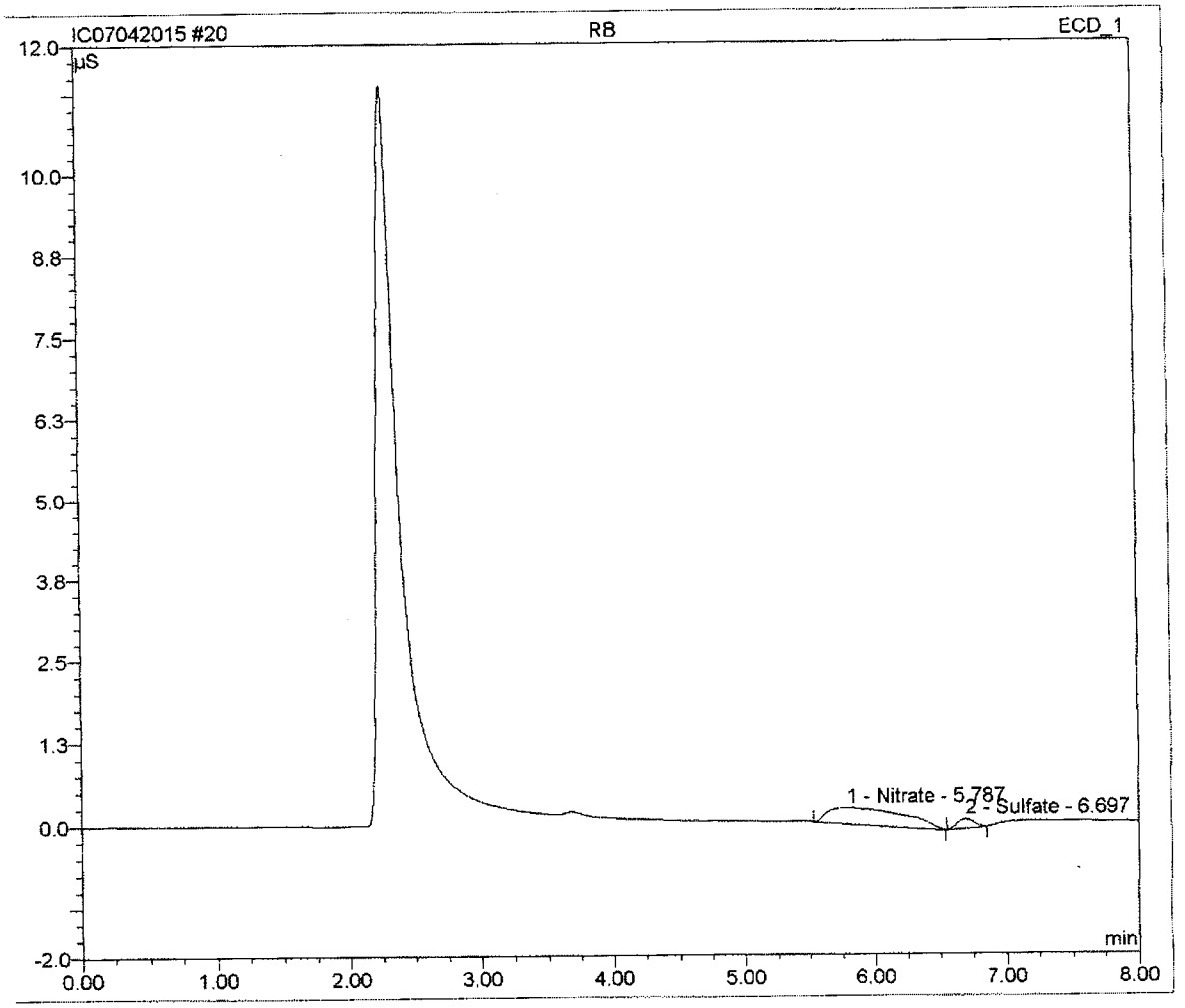
Before

APR 20 2015

4/21/15

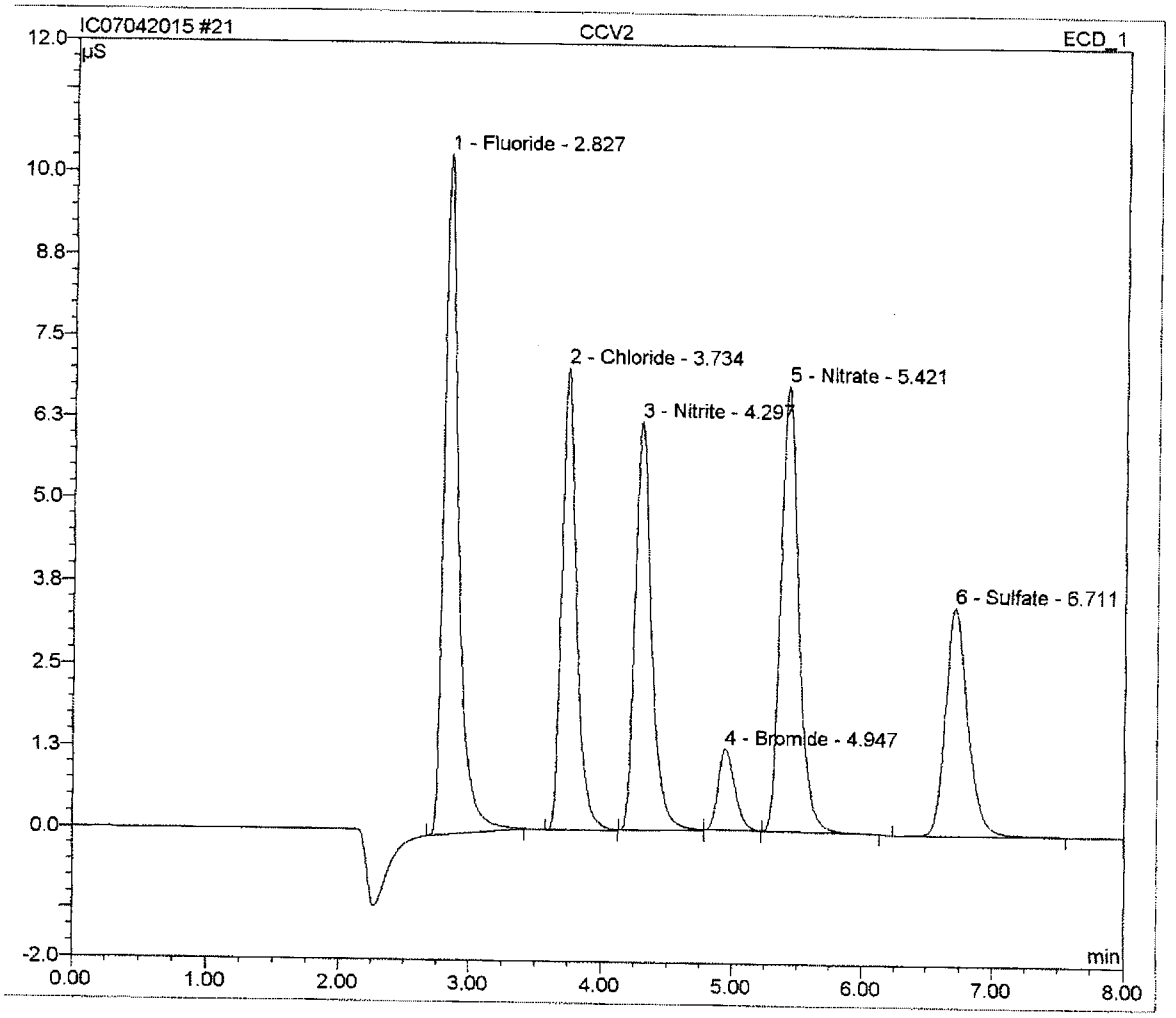
Sample Name:	**RB**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:43**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	5.79	Nitrate	BMB	0.168	0.237	0.3822
2	6.70	Sulfate	BMB	0.020	0.134	0.1451
		TOTAL:		0.19	0.37	0.53



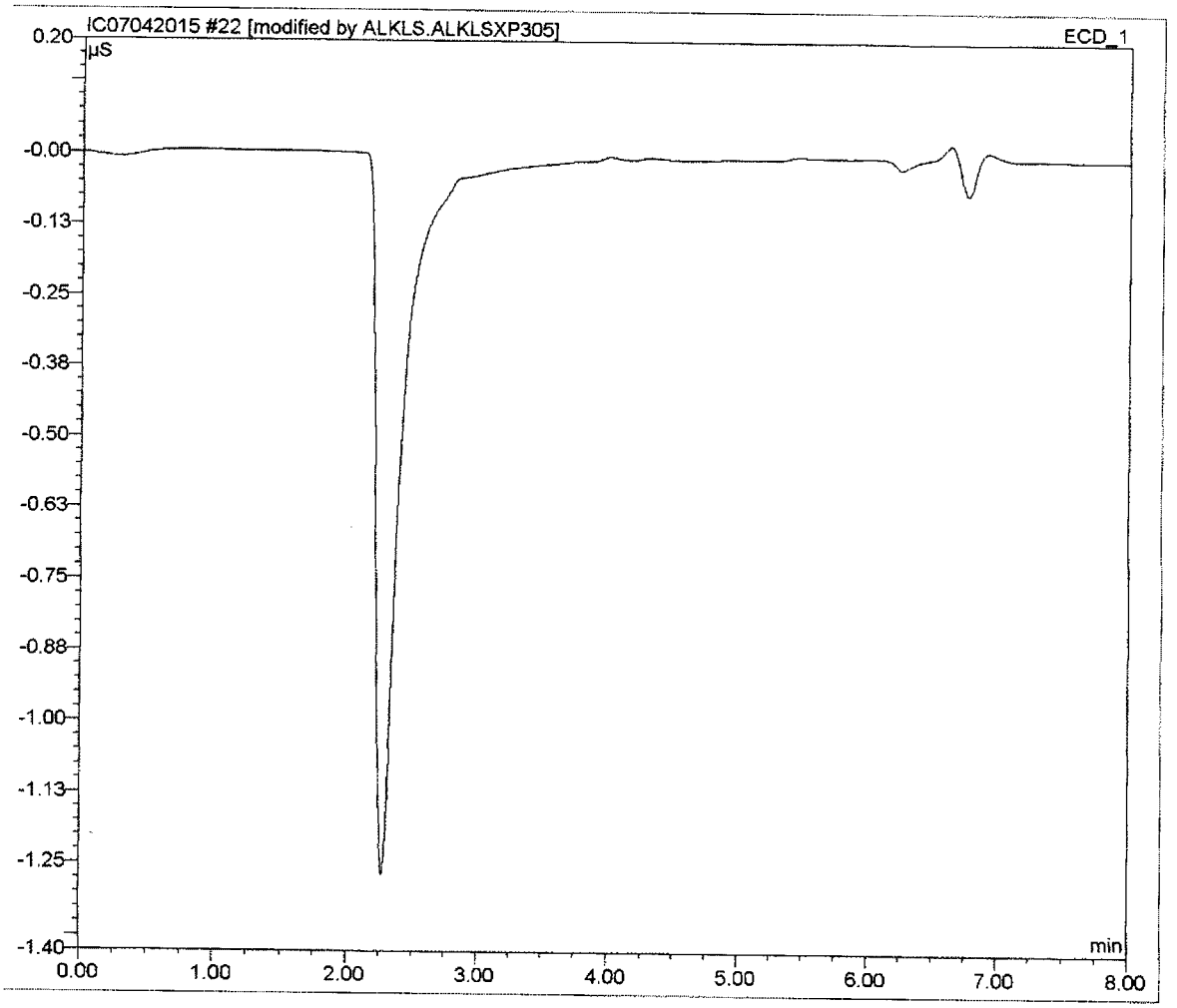
Sample Name:	**CCV2**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 14:52**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm	
1	2.83	Fluoride	BMB	1.349	10.372	5.0501	101
2	3.73	Chloride	BMB	0.910	7.040	5.0386	101
3	4.30	Nitrite	BMB	0.899	6.217	2.4893	100
4	4.95	Bromide	bMB	0.182	1.241	2.5627	102
5	5.42	Nitrate	BMB	1.084	6.780	2.4626	98
6	6.71	Sulfate	BMB	0.693	3.480	5.0650	101
		TOTAL:		5.12	35.13	22.67	



Sample Name:	**CCB2**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 15:02**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
			TOTAL:	0.00	0.00	0.00



4/21/15

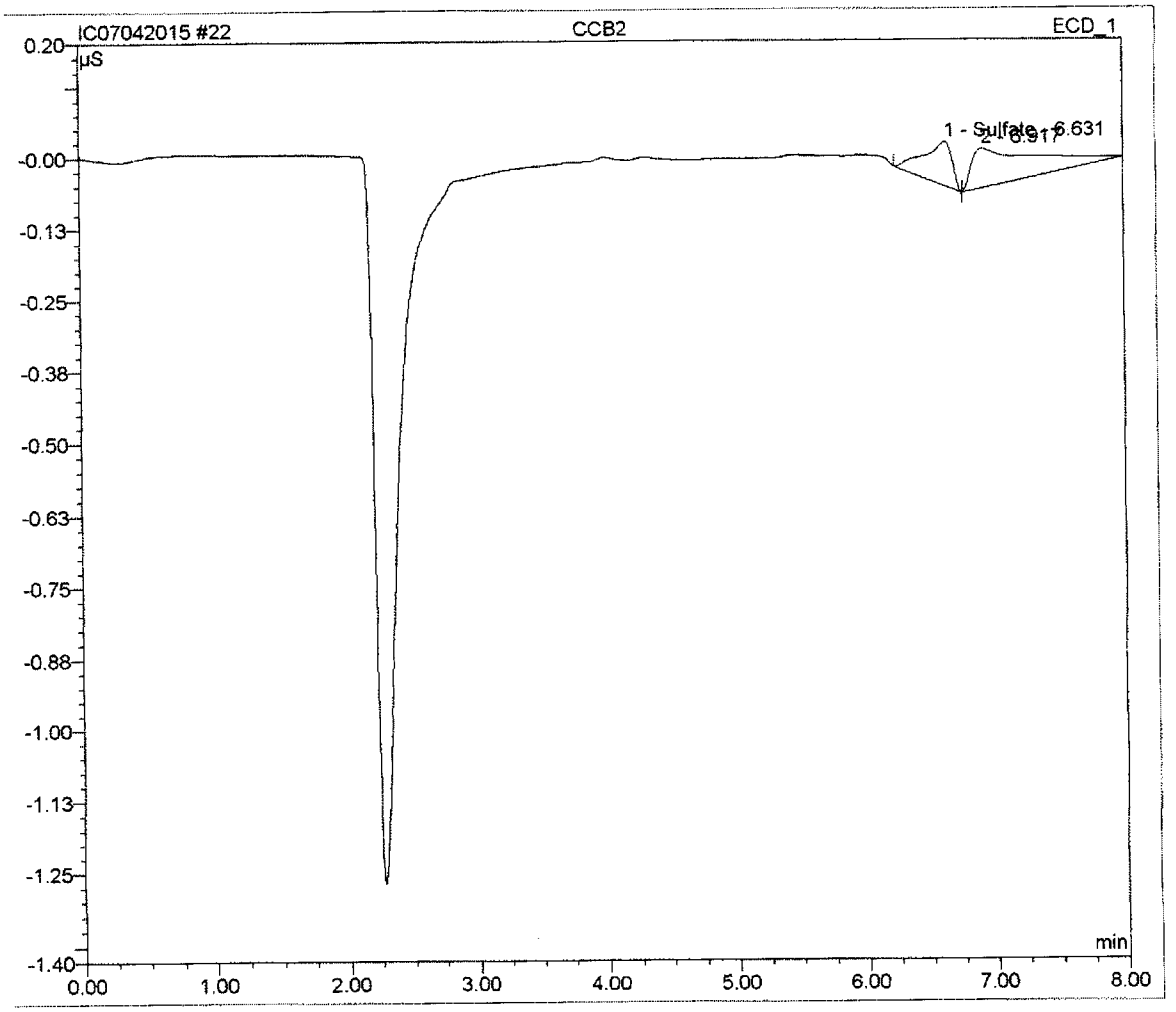
After
Initials 61

APR 20 2015

☐Wrong Peak/Peak not Found
☑Baseline/shoulder Incorrect
☐Other

Sample Name:	**CCB2**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 15:02**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	6.63	Sulfate	BMB	0.019	0.077	0.1383
		TOTAL:		0.02	0.08	0.14



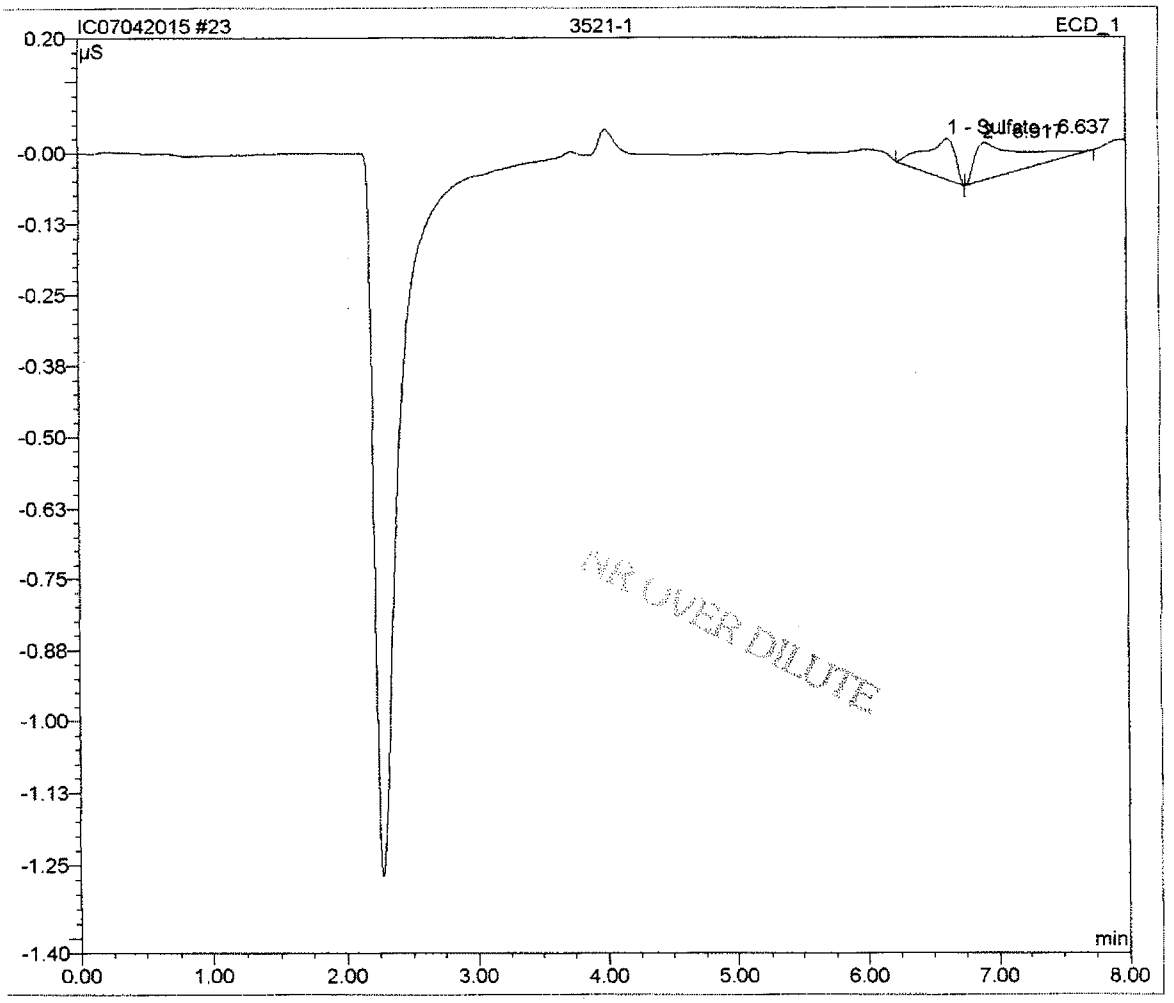
Before

APR 2 0 2015

4/21/15

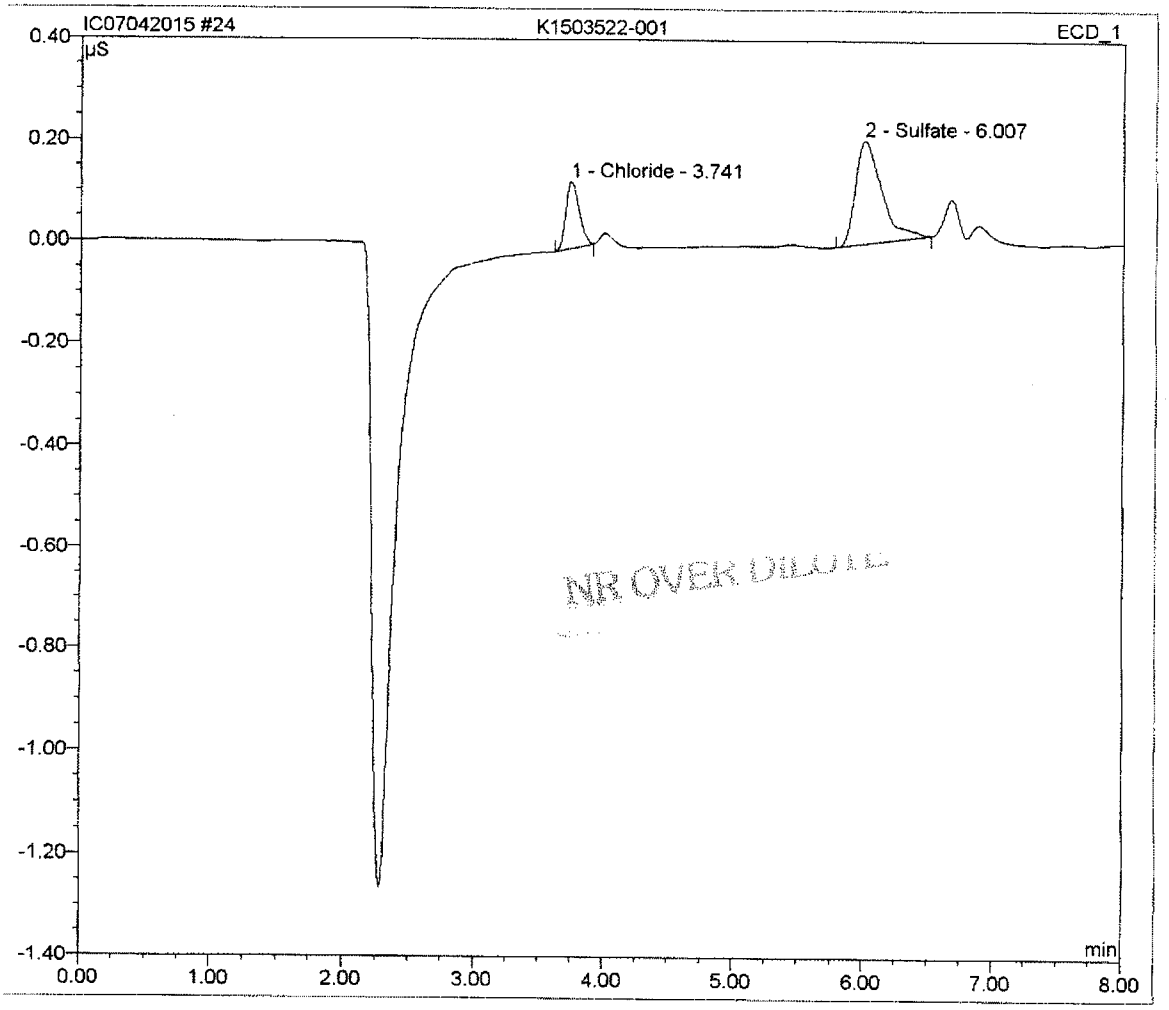
Sample Name:	**3521-1**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**50.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 15:13**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	6.64	Sulfate	BMB	0.019	0.072	6.8167
		TOTAL:		0.02	0.07	6.82



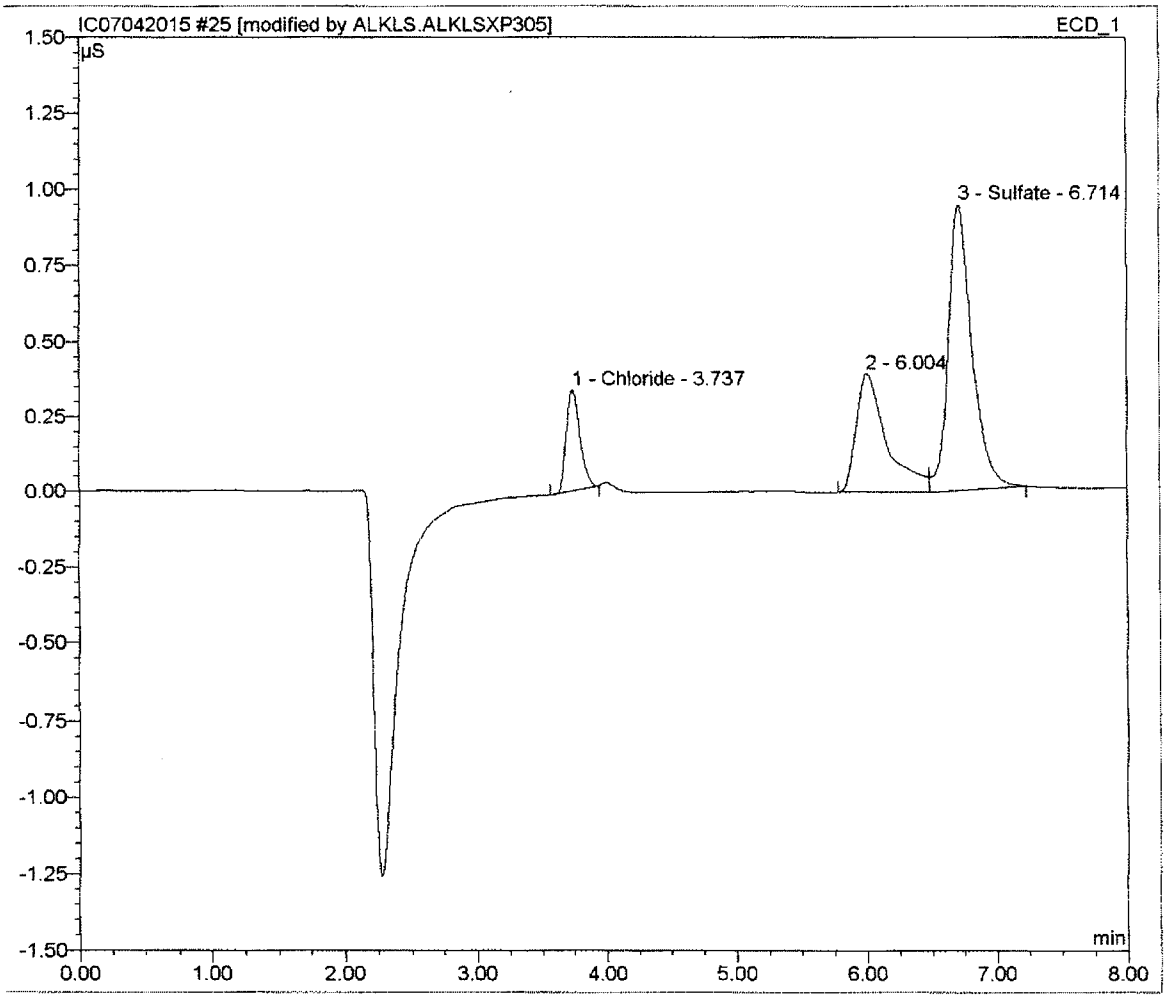
Sample Name:	**K1503522-001**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**20.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 15:23**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.016	0.131	1.7456
2	6.01	Sulfate	BMB	0.048	0.203	7.0246
		TOTAL:		0.06	0.33	8.77



Sample Name:	**K1503652-001**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**50.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 15:32**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.041	0.338	11.4708
3	6.71	Sulfate	MB*	0.201	0.947	73.5350
		TOTAL:		0.24	1.28	85.01



4/21/15

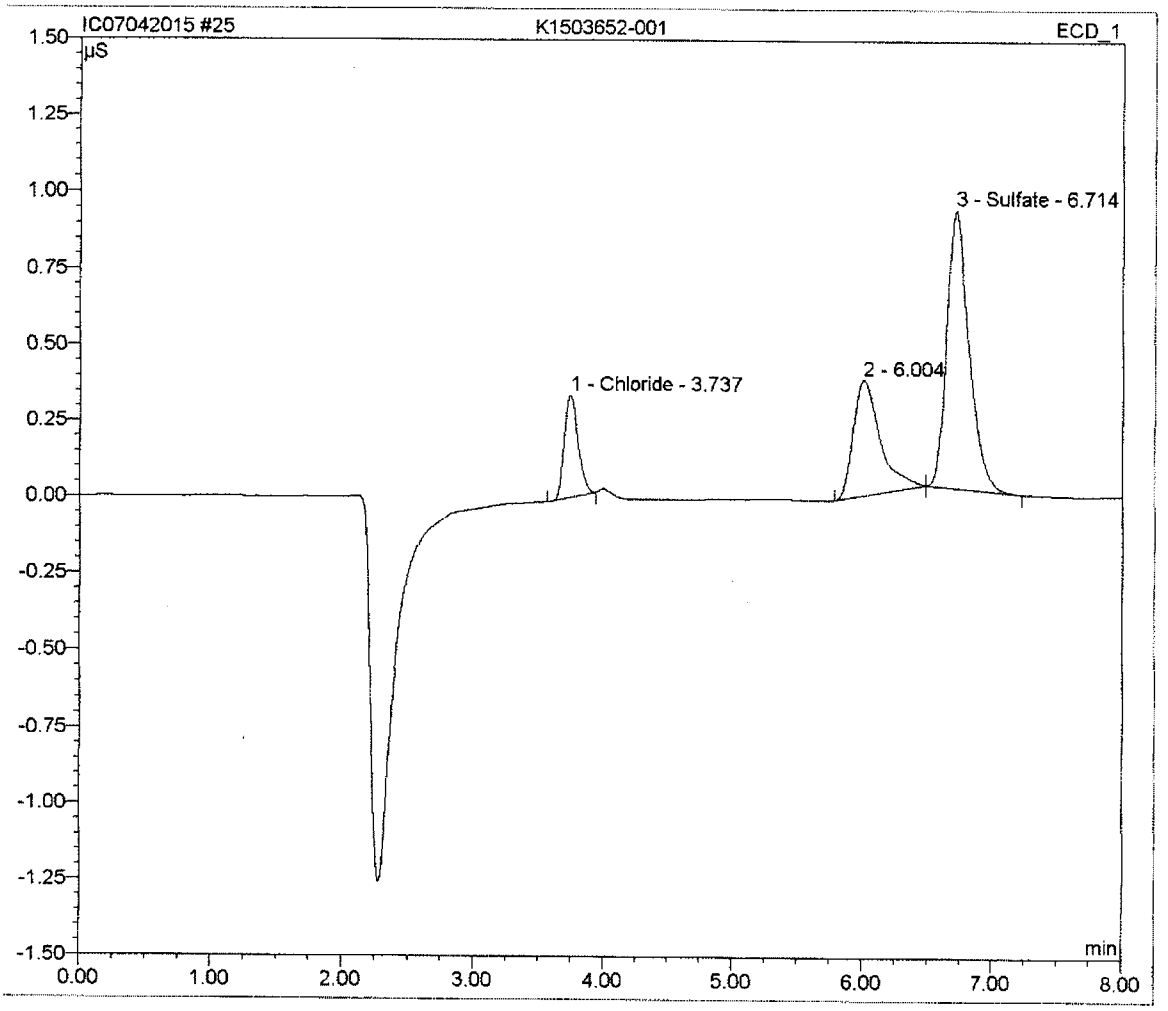
After
Initials br

APR 20 2015

☐Wrong Peak/Peak not Found
☑Baseline/shoulder incorrect
☐Other

Sample Name:	**K1503652-001**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**50.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 15:32**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.041	0.338	11.4708
3	6.71	Sulfate	bMB	0.182	0.911	66.6330
		TOTAL:		0.22	1.25	78.10

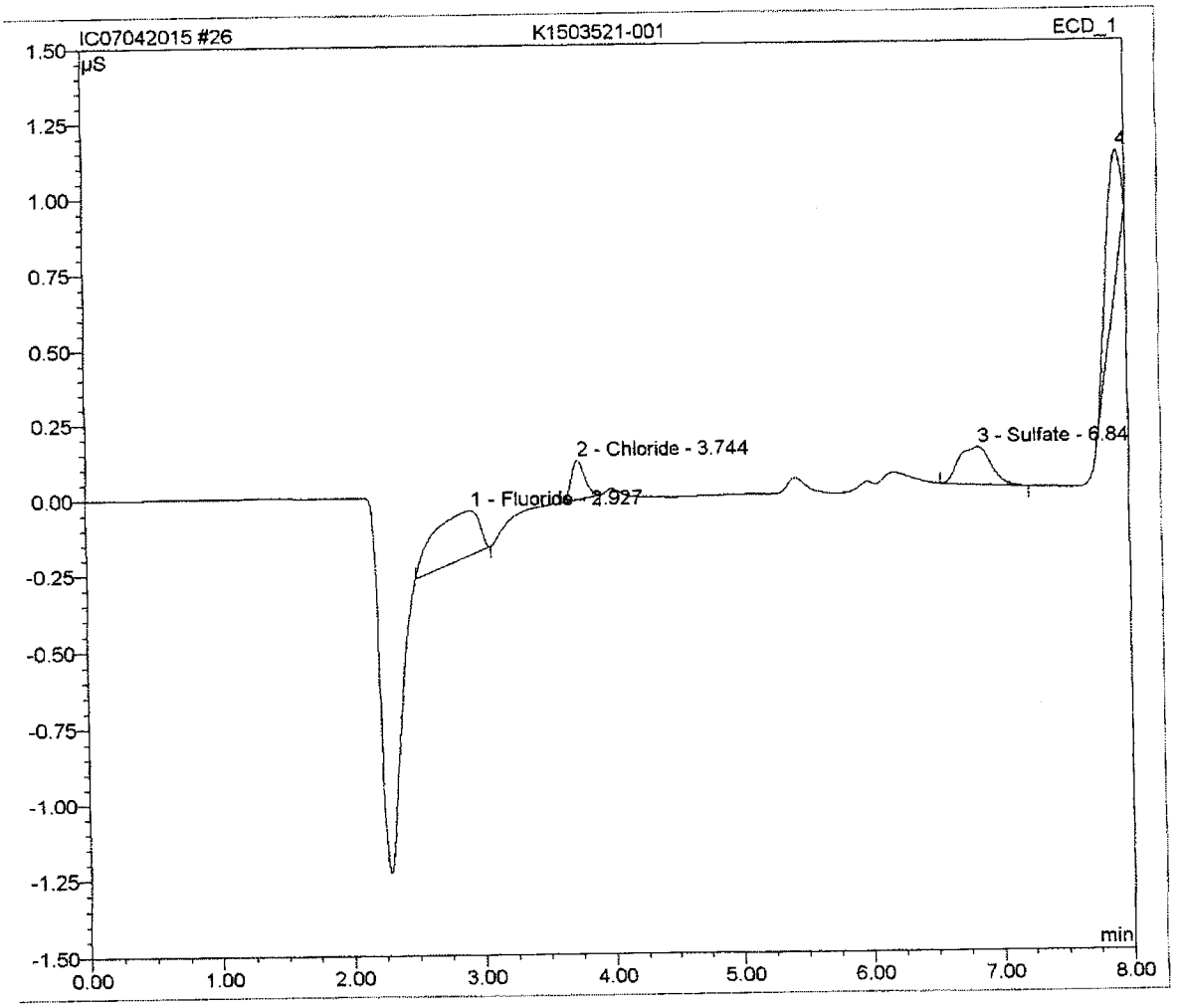


4/22/15

Before
BV
APR 20 2015

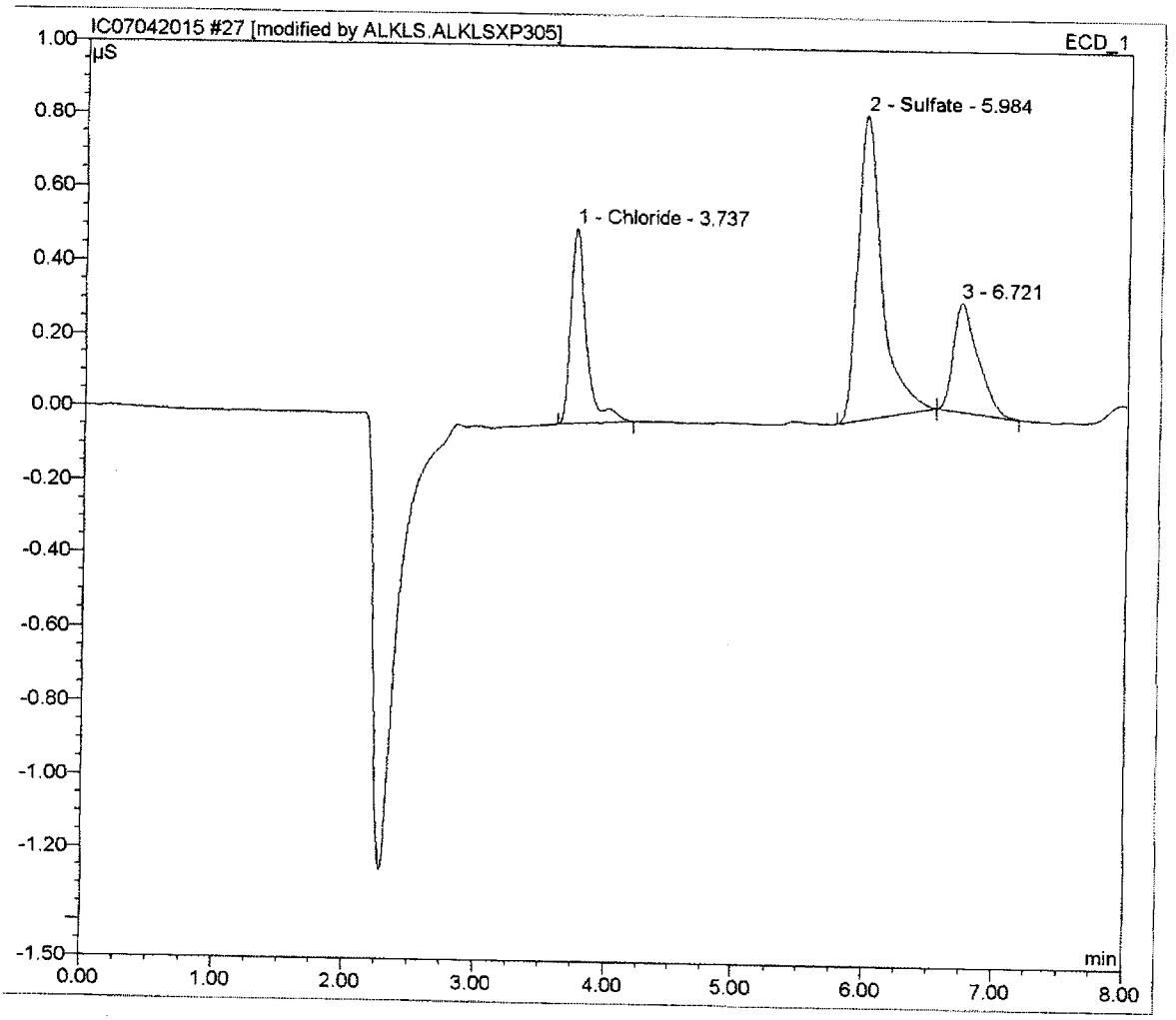
Sample Name:	**K1503521-001**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**2.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 15:42**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.93	Fluoride	BMB	0.064	0.146	0.4826
2	3.74	Chloride	BMB	0.016	0.128	0.1731
3	6.84	Sulfate	BMB	0.035	0.124	0.5084
		TOTAL:		0.11	0.40	1.16



Sample Name:	**K1503522-001**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**5.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 15:51**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB*	0.075	0.536	2.0705
2	5.98	Sulfate	BMb	0.179	0.831	6.5452
		TOTAL:		0.25	1.37	8.62



4/21/15

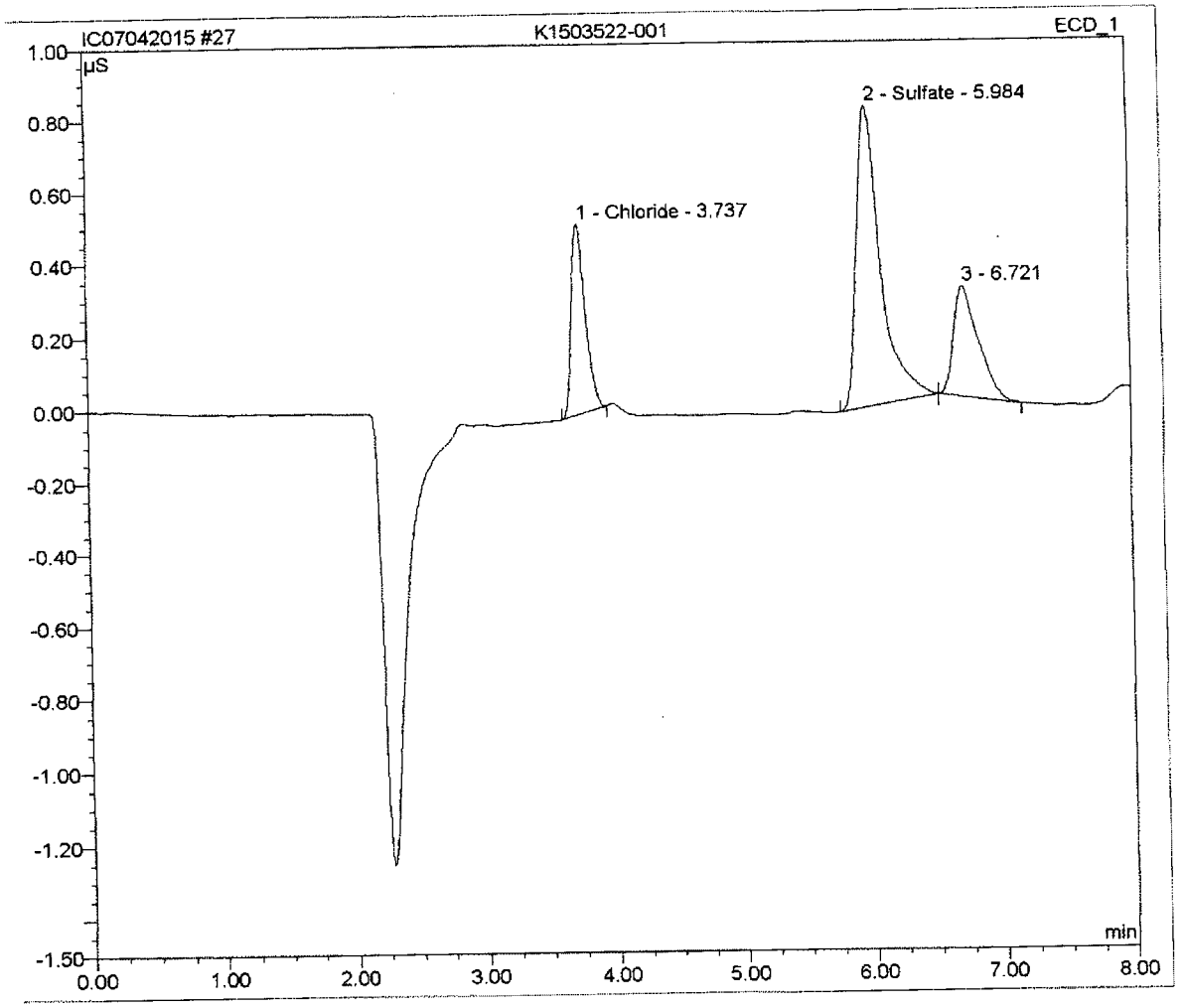
After
Initials DY

APR 20 2015

☐Wrong Peak/Peak not Found
☐Baseline/shoulder Incorrect
☐Other

Sample Name:	**K1503522-001**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**5.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 15:51**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	3.74	Chloride	BMB	0.065	0.524	1.7950
2	5.98	Sulfate	BMb	0.179	0.831	6.5452
		TOTAL:		0.24	1.35	8.34

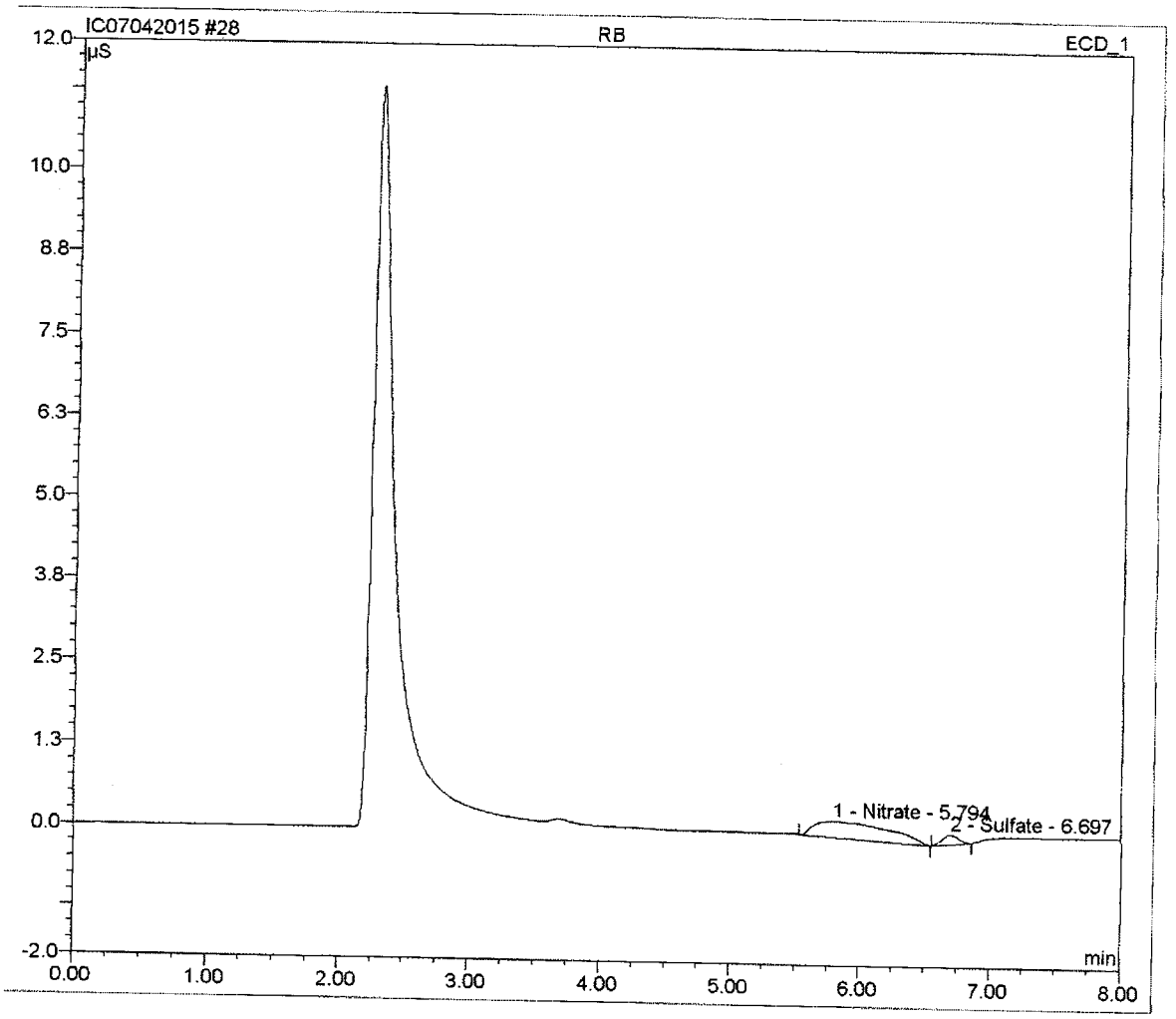


Before
APR 20 2015

4/21/15

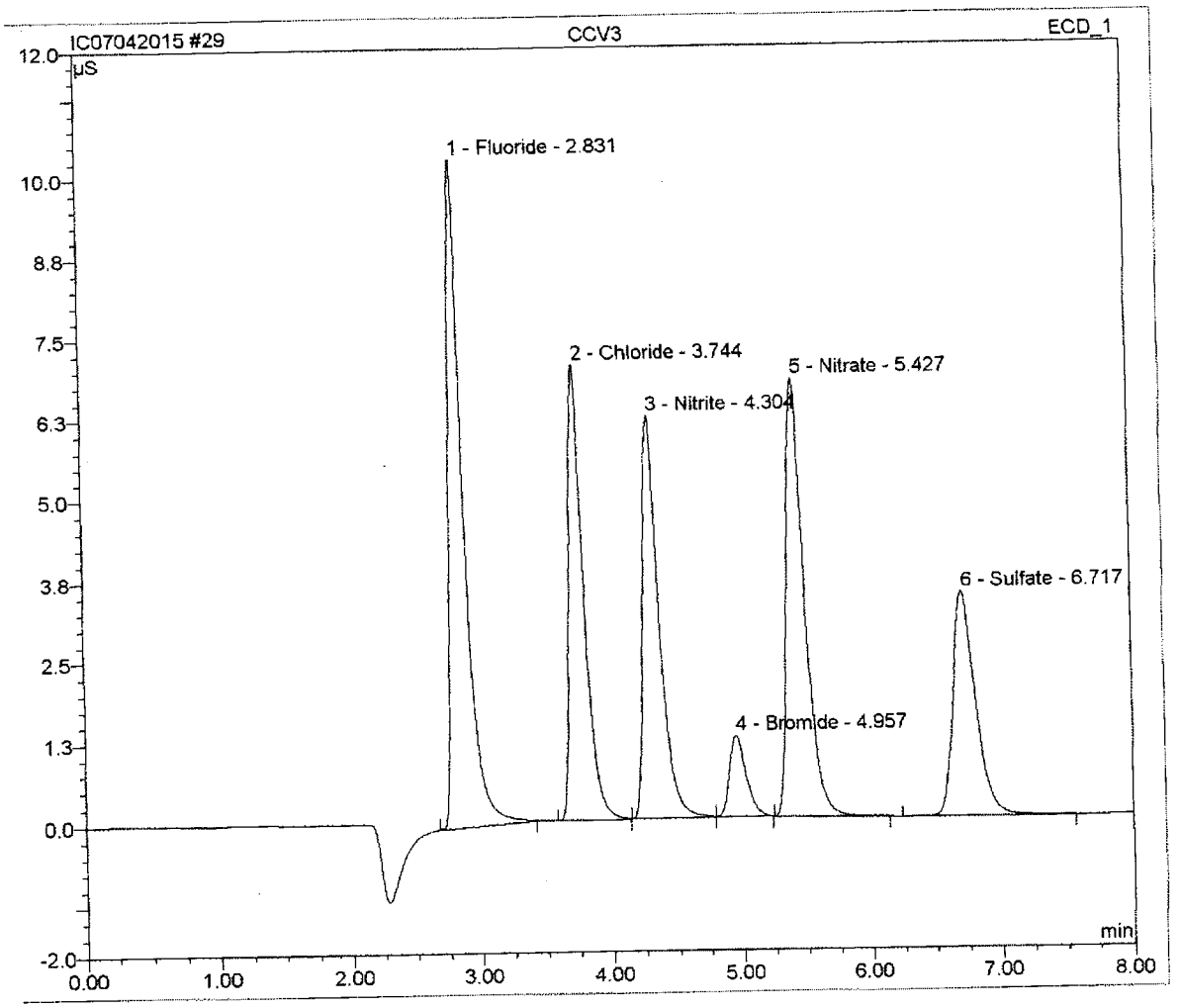
Sample Name:	**RB**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 16:01**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	5.79	Nitrate	BMB	0.170	0.239	0.3859
2	6.70	Sulfate	BMB	0.020	0.134	0.1441
		TOTAL:		0.19	0.37	0.53



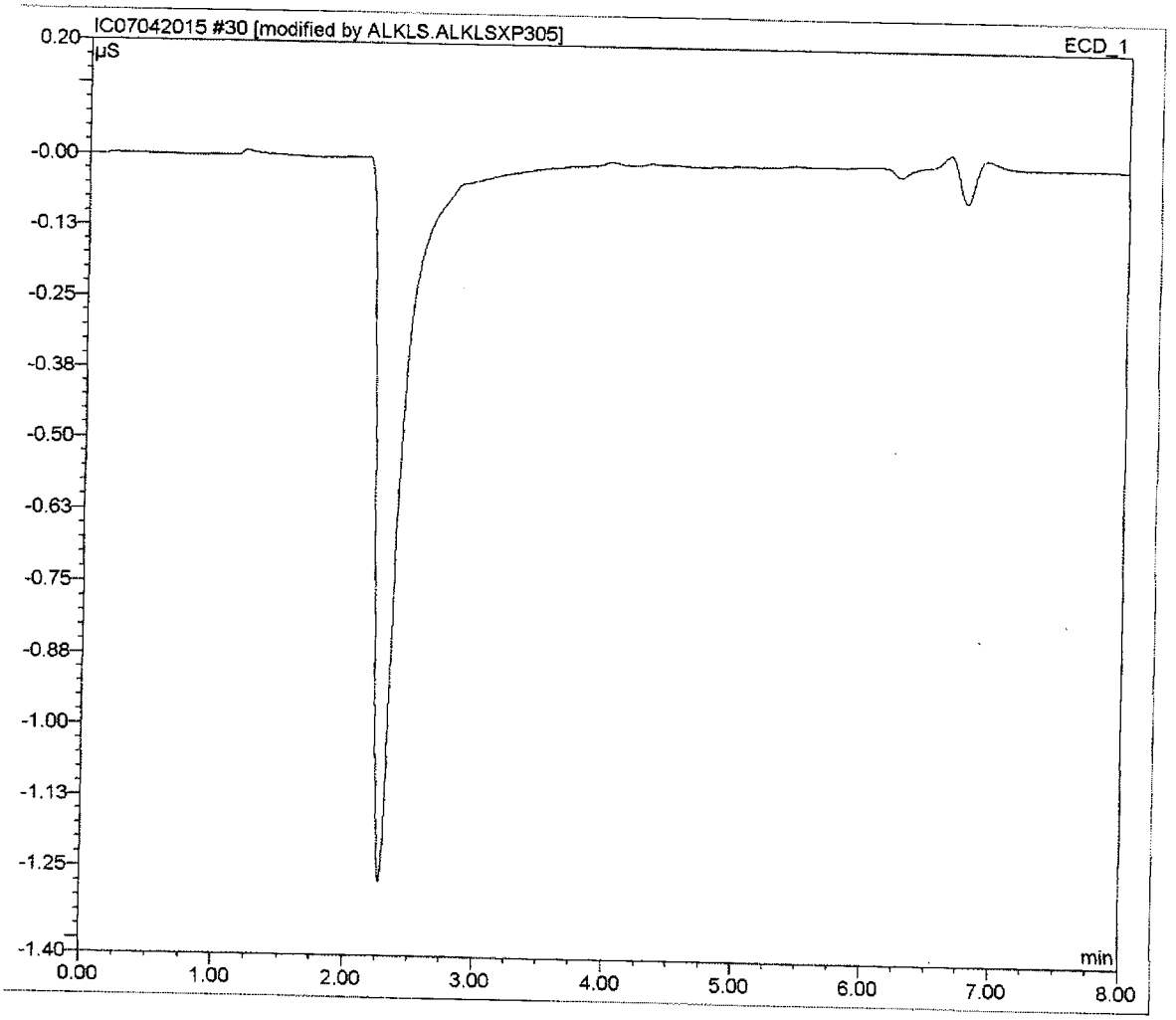
Sample Name:	**CCV3**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 16:11**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm	
1	2.83	Fluoride	BMB	1.346	10.342	5.0407	101
2	3.74	Chloride	BMB	0.915	7.024	5.0655	101
3	4.30	Nitrite	BMB	0.897	6.212	2.4821	99
4	4.96	Bromide	BMB	0.182	1.238	2.5604	102
5	5.43	Nitrate	BMB	1.079	6.758	2.4508	98
6	6.72	Sulfate	BMB	0.692	3.472	5.0563	101
			TOTAL:	5.11	35.05	22.66	



Sample Name:	**CCB3**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 16:21**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
			TOTAL:	0.00	0.00	0.00



4/21/15

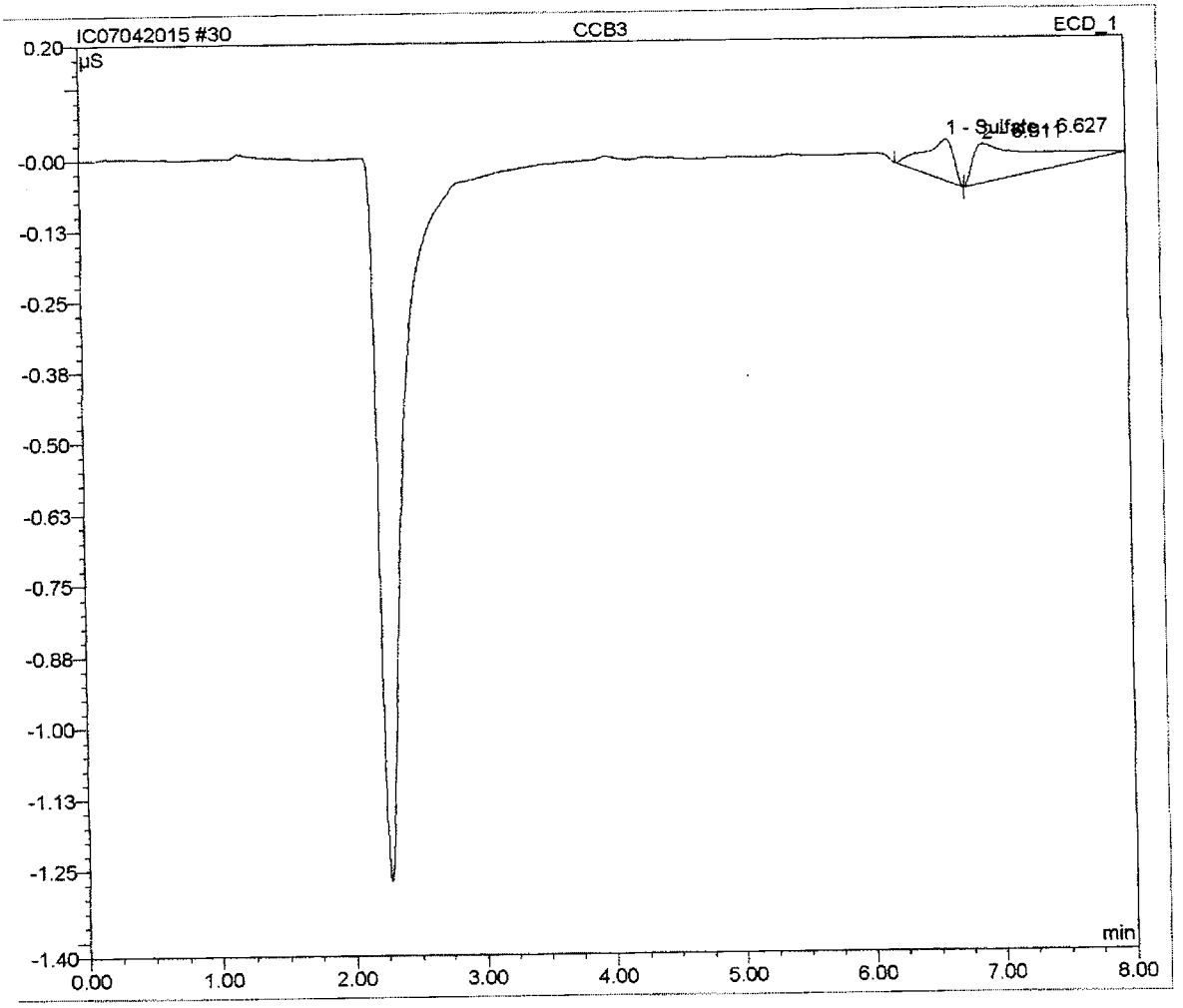
After
Initials bl

APR 20 2015

☐Wrong Peak/Peak not Found
☒Baseline/shoulder incorrect
☐Other

Sample Name:	**CCB3**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**20/04/15 16:21**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	6.63	Sulfate	BMB	0.019	0.074	0.1363
		TOTAL:		0.02	0.07	0.14



Before

APR 2 0 2015

4/21/15

Ion Chromatography

Analysis: 300.0
ICAL Date: 1.5.15

Instrument (Circle One)
IC3 IC5 IC6 IC7

IC INITIAL CALIBRATION CHECKLIST

1. The following documentation is in the ICAL file
   Sequence information
   Blank analysis information
   Retention Time information
   Calibration Status information
   Response Factor information
   Data Analysis information
   Quantitation information for each calibration standard
   ICV and CCV Quantitation information
2. The ICAL was performed without interruption
3. All calibration standards have been analyzed within 24 hours
4. The analytes in the blank analysis are < MRL
5. The retention times have been updated from the retention time marker standard
6. Each analyte's ICAL includes a minimum of 3 concentrations
7. For each analyte only one value is used for each calibration level
8. For each analyte the lowest standard's concentration is < or = the MRL
9. For each analyte the ICAL includes >3 concentration levels
10. For each analyte no levels are skipped
11. For the ICV analysis is percent recovery 90% to 110% for each analyte
12. All peak integrations are acceptable

	Yes	No
11.	☒	☐
12.		

Comments:

Reviewed by: GH
Date: 3.9.15
Supervisor Review:
Date:

COLUMBIA ANALYTICAL SERVICES, INC.

Ion Chromatography Calibration Data

Sequence: IC07010515C **Date: 1.5.15**

Anion	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Corr.Coeff.	Slope
F	0.0	0.1	0.2	0.5	1.0	5.0	7.5	10.0	99.987	0.2671
Cl	0.0	0.1	0.2	0.5	1.0	5.0	7.5	10.0	99.972	0.1807
NO2	0.0	0.05	0.1	0.5	1.0	2.0	5.0	-	99.978	0.3612
Br	0.0	0.05	0.1	0.5	1.0	2.0	5.0	-	99.994	0.0712
NO3	0.0	0.05	0.1	0.5	1.0	2.0	5.0	-	99.965	0.4402
SO4	0.0	0.1	0.2	0.5	1.0	5.0	7.5	10.0	99.985	0.1369

All calibration standard concentrations are in mg/L unless otherwise noted.
Zero point forced through zero.

No.	Peak Name	Cal.Type	#Points	Rel.Std.Dev. %	Corr.Coeff. %	Offset	Slope	Curve
1	Fluoride	Lin	7	1.9526	99.987	0	0.2671	0
2	Chloride	Lin	7	2.9019	99.972	0	0.1807	0
3	Nitrite	Lin	6	3.4896	99.978	0	0.3612	0
4	Bromide	Lin	6	1.7575	99.994	0	0.0712	0
5	Nitrate	Lin	6	4.3197	99.965	0	0.4402	0
6	Sulfate	Lin	7	2.2654	99.985	0	0.1369	0
Average:			6.5	2.7811	99.9804	0	0.2429	0

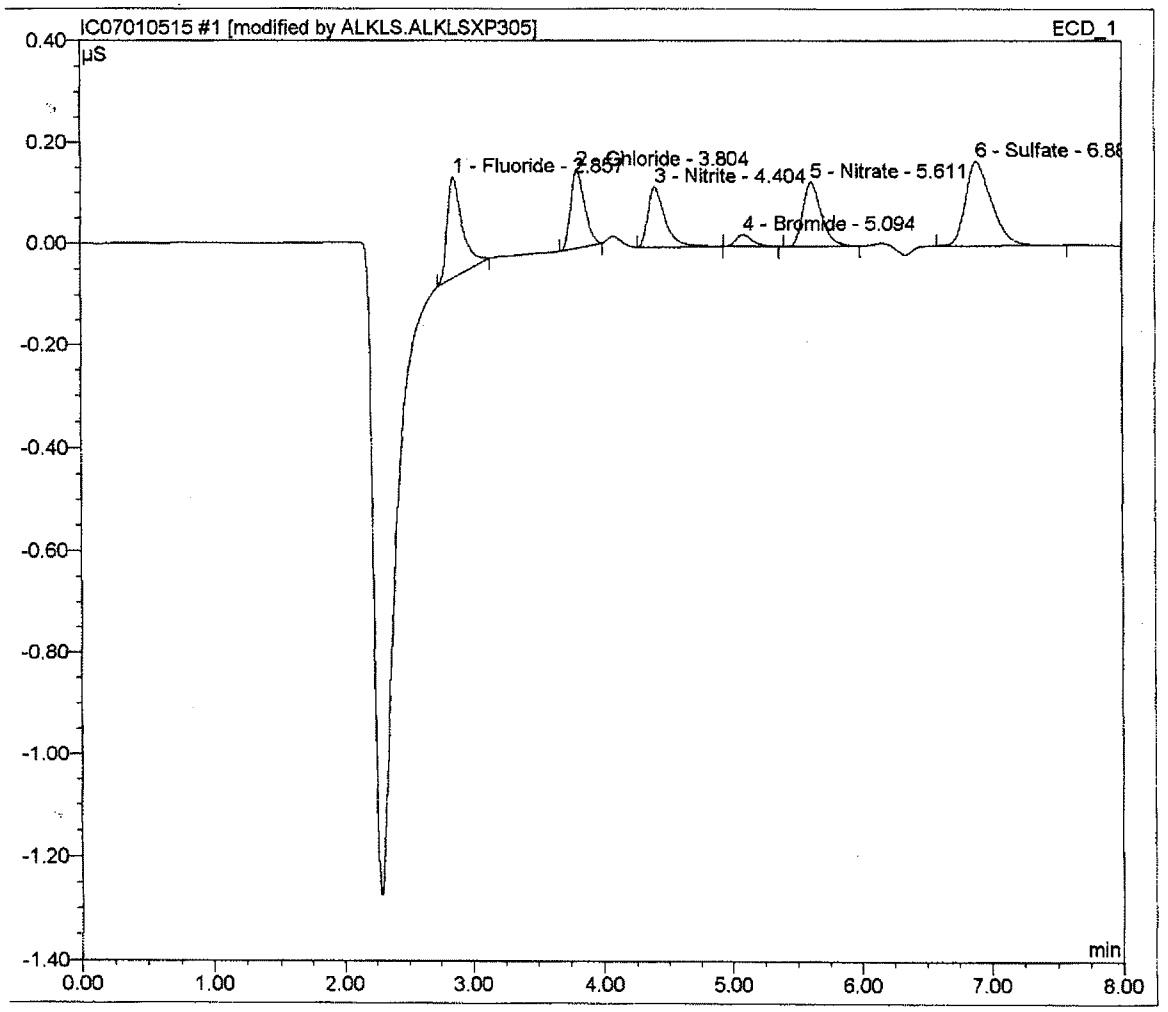
IC12/ICAL-65-A	100PPM	NO2, BR, NO3
IC12/ICAL-65-B	100PPM	F, CL, SO4

mL added

	IC12/ICAL-65-C	IC12/ICAL-65-D	IC12/ICAL-65-E	IC12/ICAL-65-F	IC12/ICAL-65-G	IC12/ICAL-65-H		
	STD2	STD3	STD4	STD5	STD6	STD7	STD8	STD1
F	0.100	0.200	0.500	1.000	5.00	7.50	10.00	0
CL	0.100	0.200	0.500	1.000	5.00	7.50	10.00	0
SO4	0.100	0.200	0.500	1.000	5.00	7.50	10.00	0
NO2	0.050	0.100	0.500	1.000	2.00	5.00	--	0
NO3	0.050	0.100	0.500	1.000	2.00	5.00	--	0
BR	0.050	0.100	0.500	1.000	2.00	5.00	--	0

Sample Name:	**STD2/LVL2**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**05/01/15 13:24**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.86	Fluoride	BMB*	0.026	0.198	0.0990
2	3.80	Chloride	BMB	0.019	0.154	0.1050
3	4.40	Nitrite	BMB	0.018	0.118	0.0498
4	5.09	Bromide	BMB*	0.003	0.023	0.0485
5	5.61	Nitrate	BMB	0.021	0.126	0.0478
6	6.89	Sulfate	BMB	0.038	0.165	0.2766
		TOTAL:		0.13	0.78	0.63



After
Initials 54

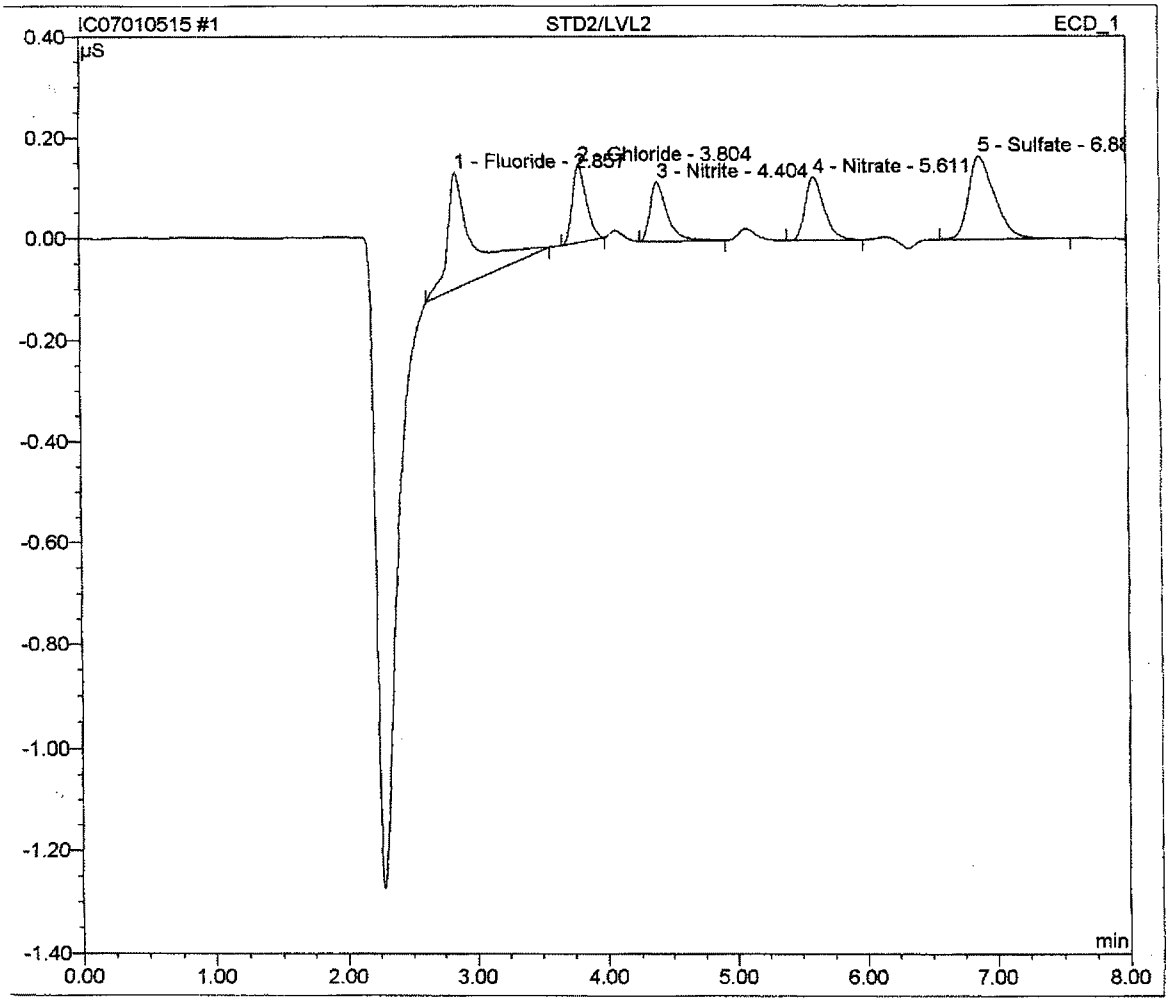
MAR 09 2015

☐Wrong Peak/Peak not Found
☒Baseline/shoulder Incorrect
☐Other

Chromeleon (c) Dionex 1996-2008
Version 6.80 SR10 Build 2818 (166959)

Sample Name:	**STD2/LVL2**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**05/01/15 13:24**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.86	Fluoride	BMB	0.051	0.231	0.1924
2	3.80	Chloride	BMB	0.019	0.154	0.1050
3	4.40	Nitrite	BMB	0.018	0.118	0.0498
4	5.61	Nitrate	BMB	0.021	0.126	0.0478
5	6.89	Sulfate	BMB	0.038	0.165	0.2766
		TOTAL:		0.15	0.79	0.67

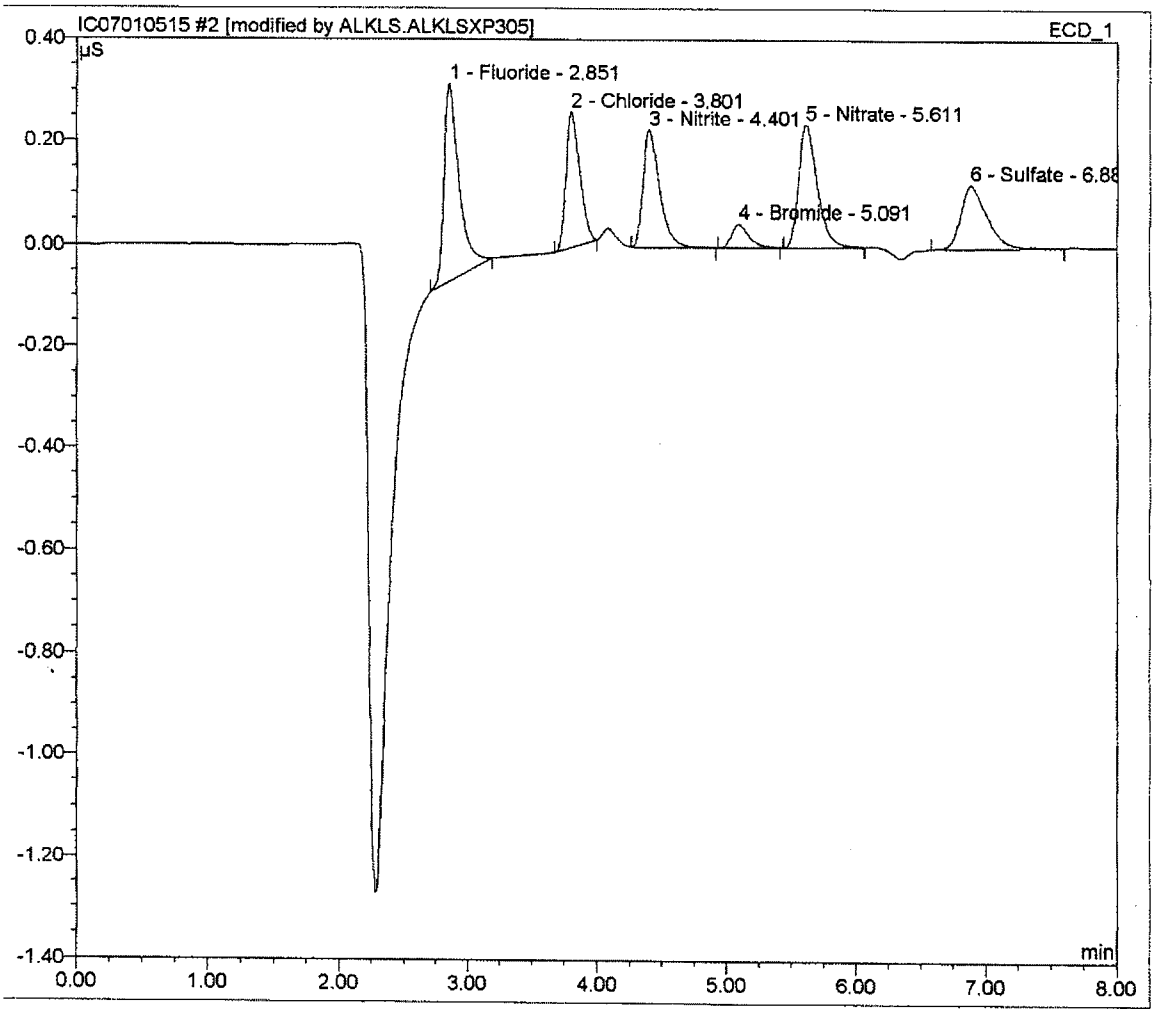


Before

MAR 09 2015 AV

Sample Name:	**STD3/LVL3**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**05/01/15 13:33**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.85	Fluoride	BMB*	0.052	0.385	0.1957
2	3.80	Chloride	BMB	0.032	0.261	0.1776
3	4.40	Nitrite	BMB	0.033	0.226	0.0920
4	5.09	Bromide	BMB*	0.007	0.045	0.0999
5	5.61	Nitrate	BMB	0.040	0.236	0.0903
6	6.88	Sulfate	BMB	0.029	0.121	0.2090
		TOTAL:		0.19	1.27	0.86



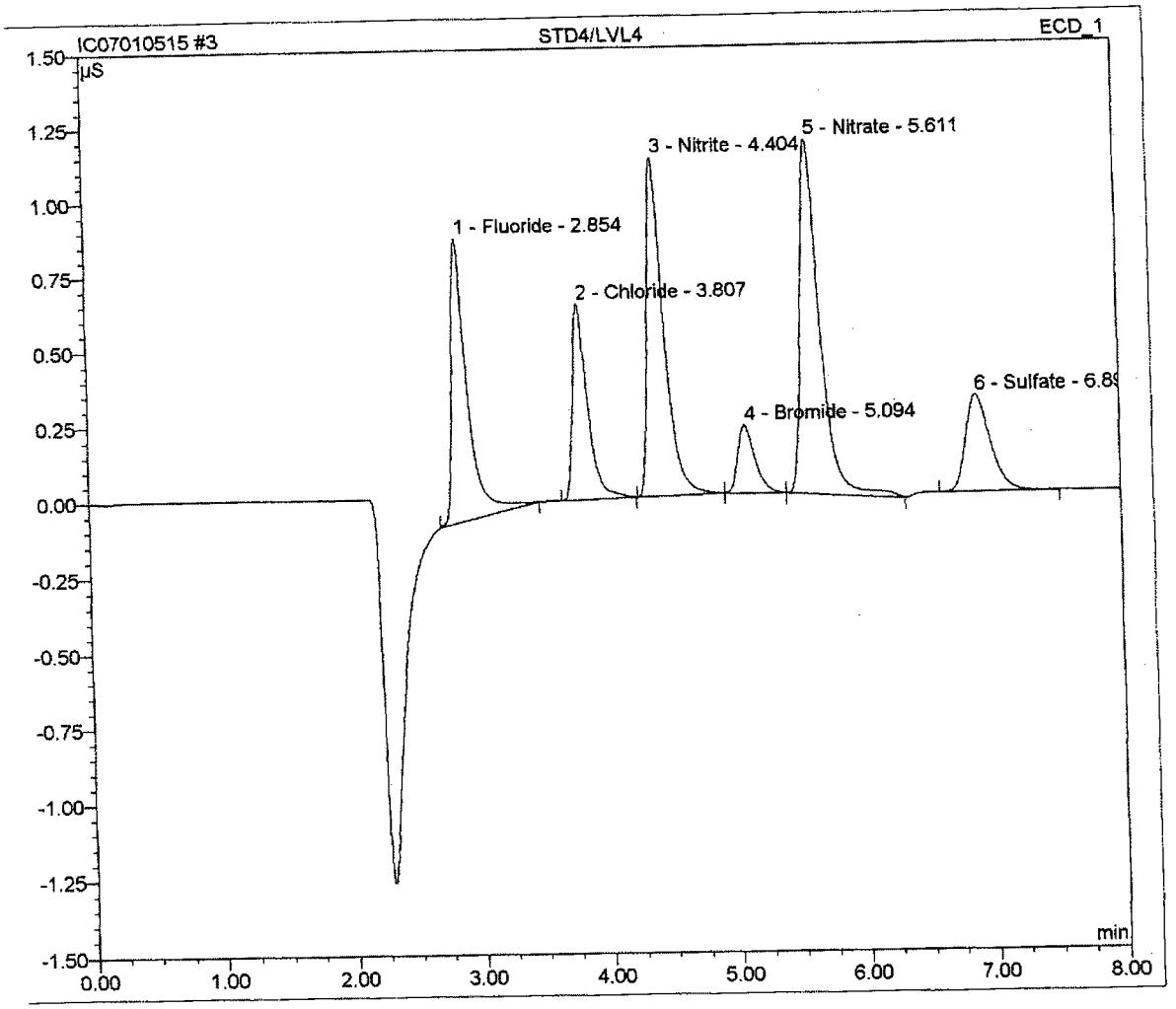
After
Initials _____

MAR 09 2015

☐Wrong Peak/Peak not Found
☐Baseline/shoulder Incorrect
☐Other _____

Sample Name:	**STD4/LVL4**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**05/01/15 13:43**	*Run Time:*	**8.00**

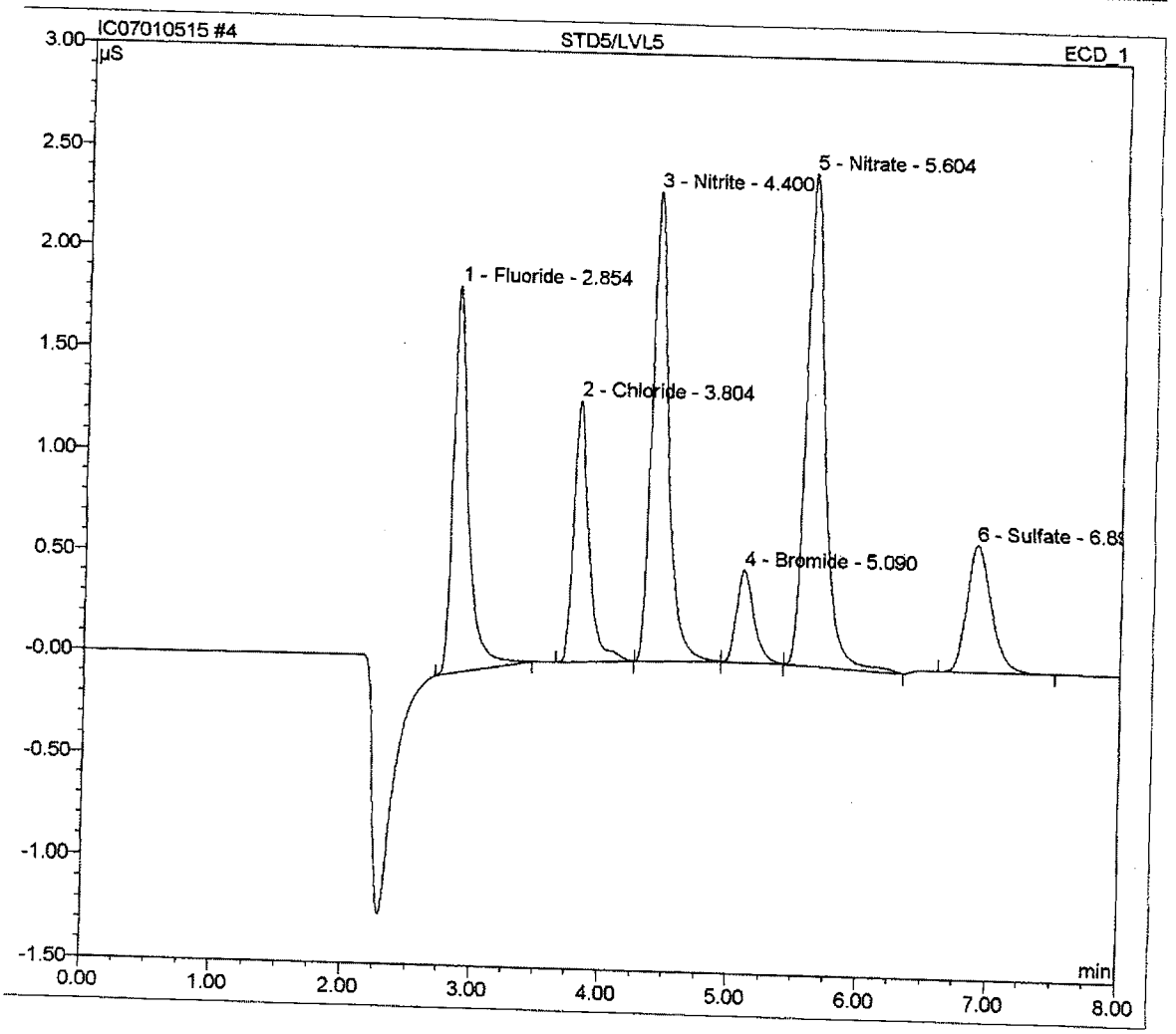
No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.85	Fluoride	BMB	0.135	0.947	0.5044
2	3.81	Chloride	BMB	0.088	0.649	0.4871
3	4.40	Nitrite	BMb	0.169	1.130	0.4683
4	5.09	Bromide	bMB	0.035	0.225	0.4850
5	5.61	Nitrate	BMB	0.208	1.183	0.4721
6	6.89	Sulfate	BMB	0.071	0.320	0.5218
		TOTAL:		0.71	4.45	2.94



Before
MAR 09 2015

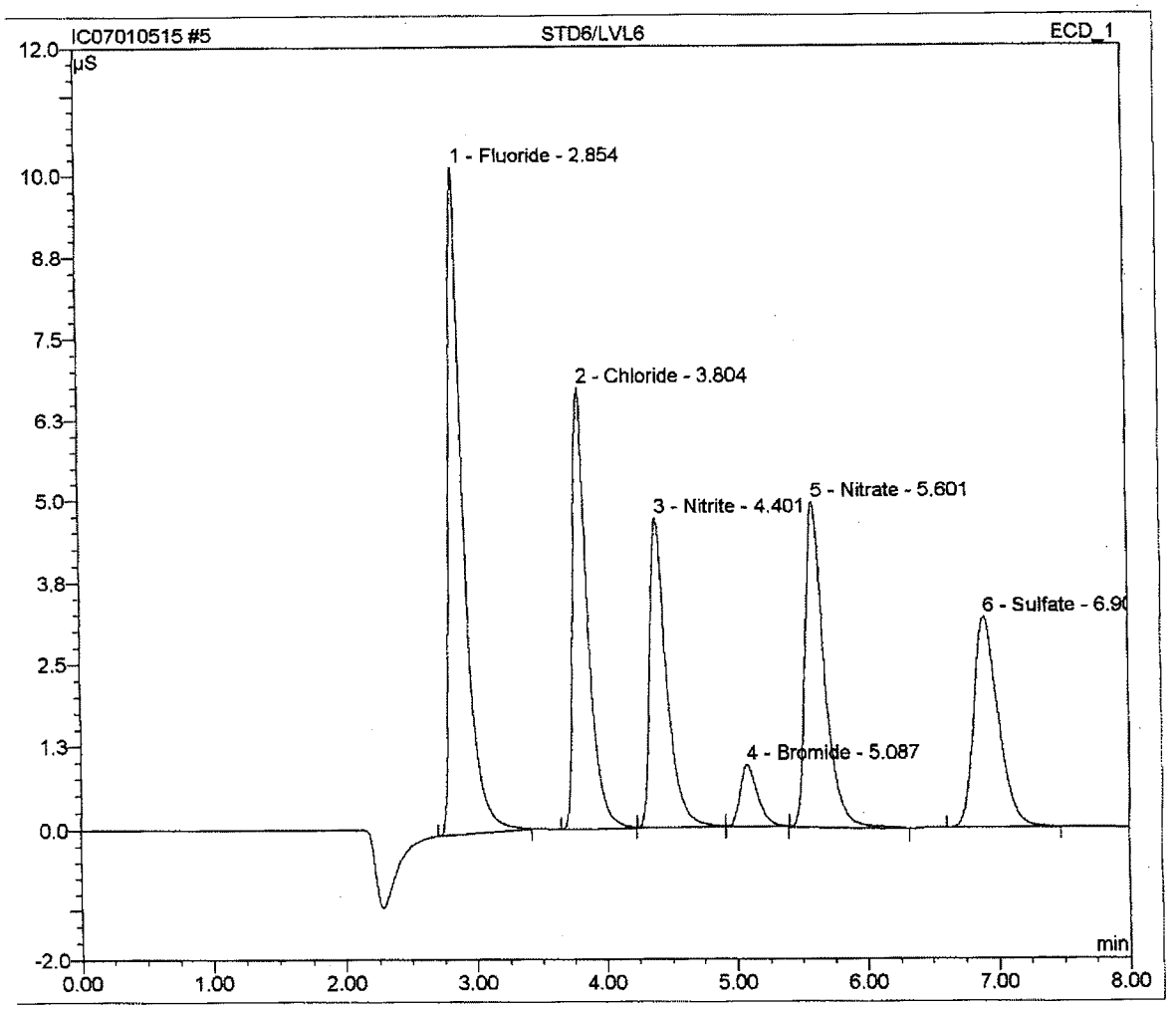
Sample Name:	**STD5/LVL5**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**05/01/15 13:52**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.85	Fluoride	BMB	0.259	1.901	0.9684
2	3.80	Chloride	BMB	0.176	1.288	0.9739
3	4.40	Nitrite	BMb	0.344	2.314	0.9528
4	5.09	Bromide	bMB	0.070	0.458	0.9860
5	5.60	Nitrate	BMB	0.415	2.427	0.9418
6	6.89	Sulfate	BMB	0.138	0.628	1.0067
		TOTAL:		1.40	9.02	5.83



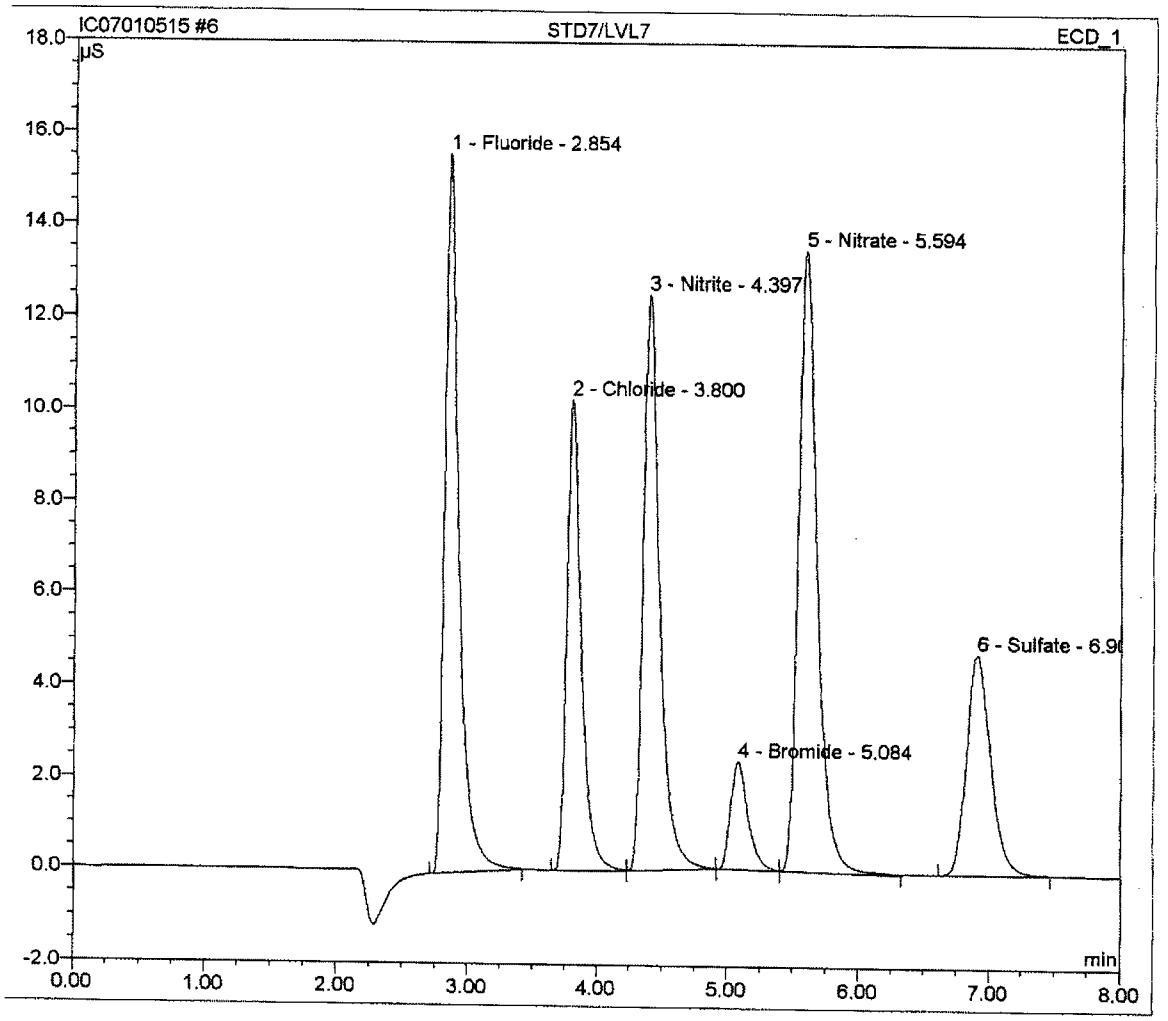
Sample Name:	**STD6/LVL6**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**05/01/15 14:02**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.85	Fluoride	BMB	1.309	10.192	4.8997
2	3.80	Chloride	BMB	0.884	6.735	4.8924
3	4.40	Nitrite	BMb	0.692	4.682	1.9170
4	5.09	Bromide	bMB	0.139	0.912	1.9530
5	5.60	Nitrate	BMB	0.834	4.937	1.8941
6	6.90	Sulfate	BMB	0.683	3.179	4.9869
		TOTAL:		4.54	30.64	20.54



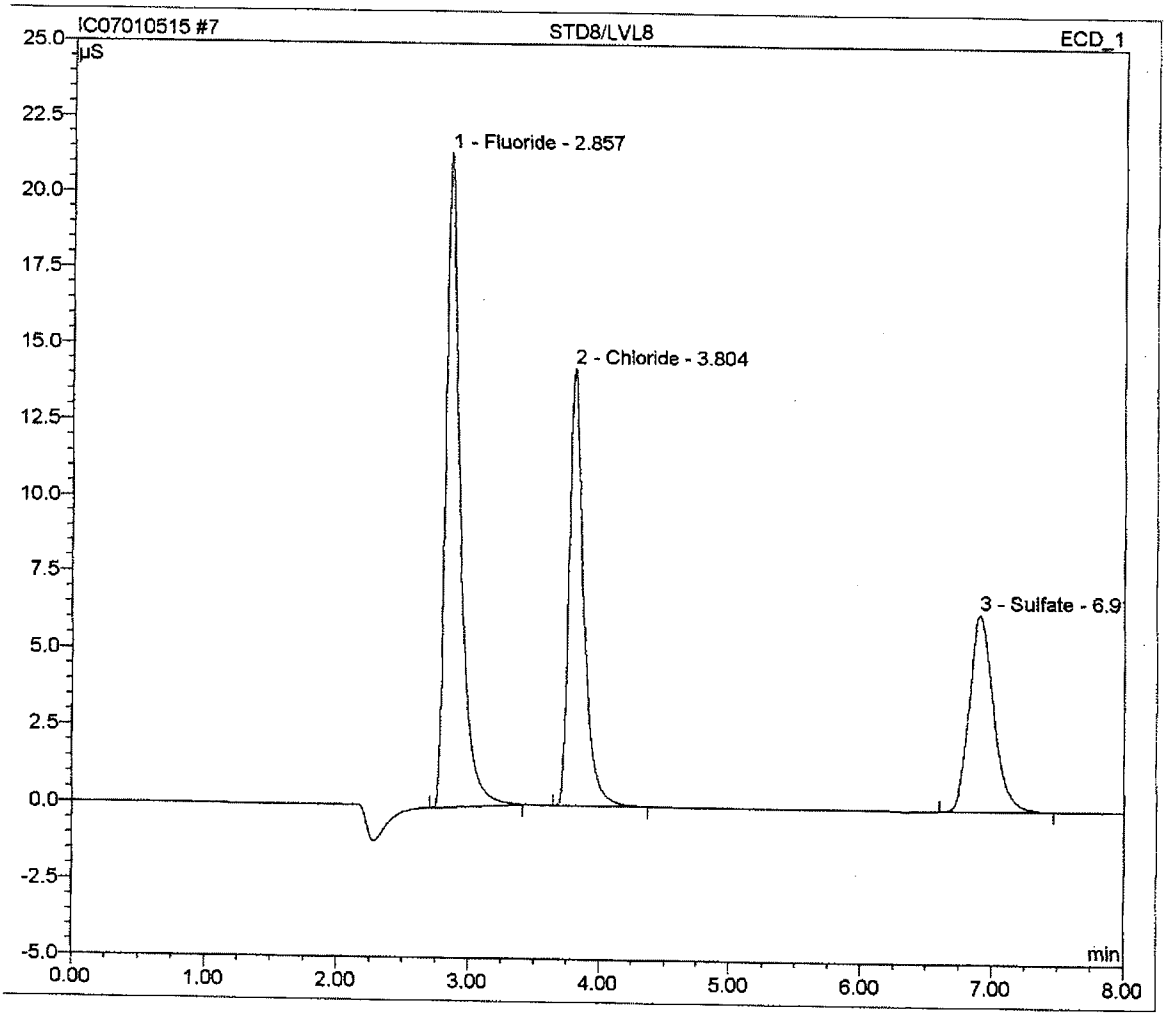
Sample Name:	**STD7/LVL7**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**05/01/15 14:12**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.85	Fluoride	BMB	1.984	15.601	7.4294
2	3.80	Chloride	BMb	1.329	10.253	7.3577
3	4.40	Nitrite	bMb	1.823	12.463	5.0460
4	5.08	Bromide	bMb	0.357	2.359	5.0231
5	5.59	Nitrate	bMB	2.226	13.442	5.0570
6	6.91	Sulfate	BMB	1.019	4.781	7.4409
		TOTAL:		8.74	58.90	37.35



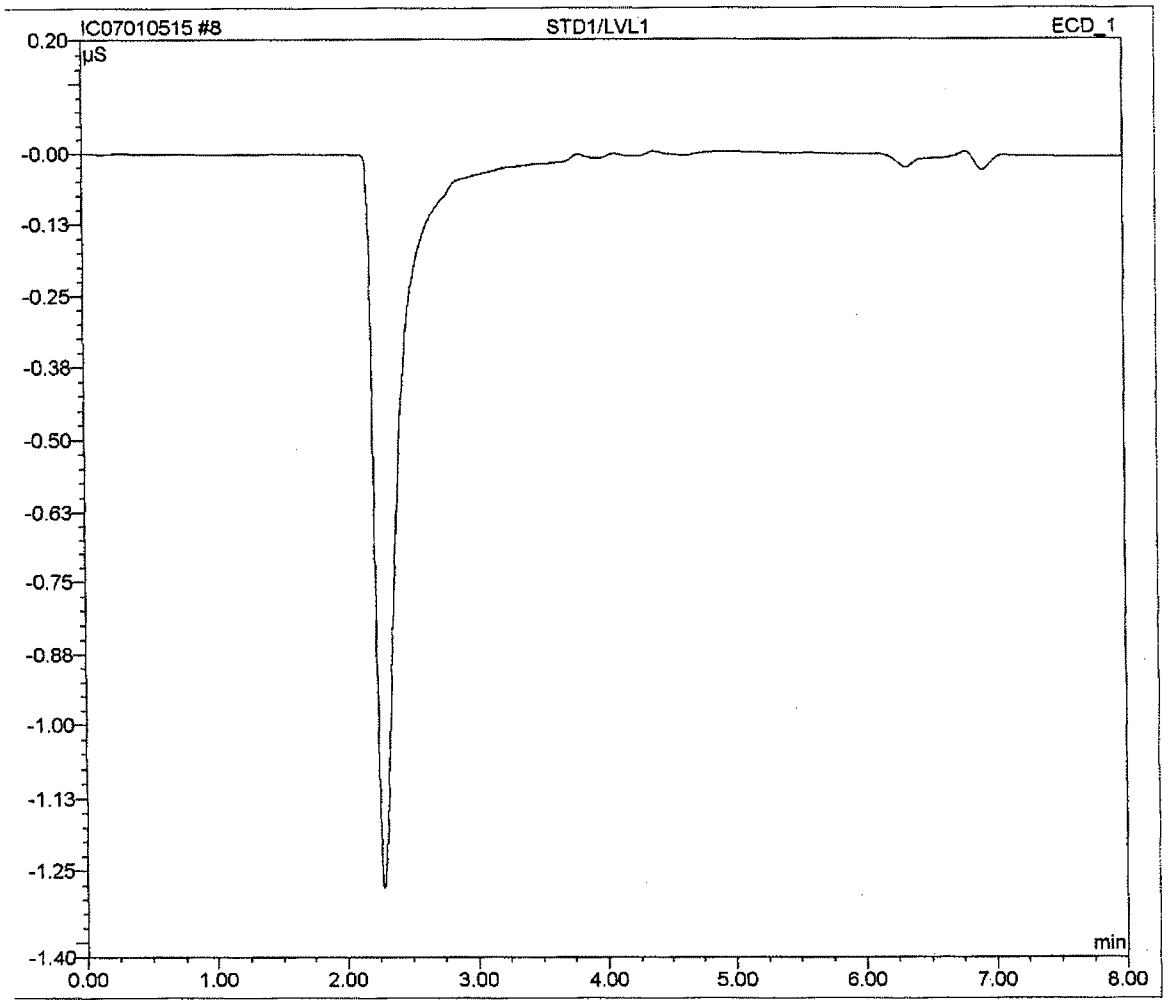
Sample Name:	**STD8/LVL8**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**05/01/15 14:21**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.86	Fluoride	BMB	2.699	21.435	10.1061
2	3.80	Chloride	BMB	1.836	14.262	10.1642
3	6.91	Sulfate	BMB	1.376	6.366	10.0472
		TOTAL:		5.91	42.06	30.32



Sample Name:	**STD1/LVL1**	*Inj. Vol.:*	**25.0**
Sample Type:	**standard**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**05/01/15 14:31**	*Run Time:*	**8.00**

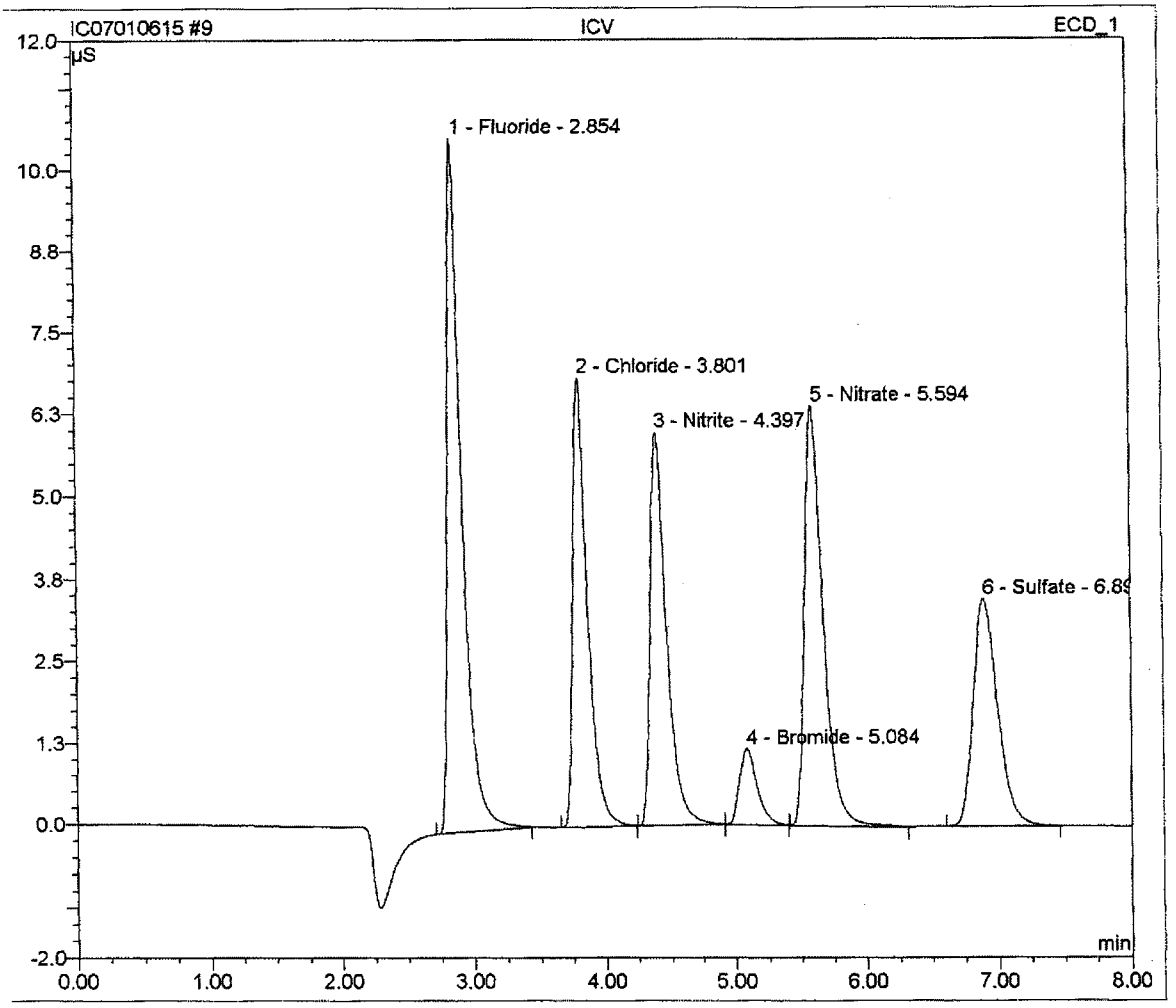
No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
		TOTAL:		0.00	0.00	0.00



Sample Name:	**ICV**	*Inj. Vol.:*	**25.0**
Sample Type:	**unknown**	*Dilution Factor:*	**1.0000**
Program:	**300**	*Operator:*	**n.a.**
Inj. Date/Time:	**06/01/15 09:46**	*Run Time:*	**8.00**

No.	Time min	Peak Name	Type	Area µS*min	Height µS	Amount ppm
1	2.85	Fluoride	BMB	1.342	10.624	5.0265
2	3.80	Chloride	BMB	0.882	6.838	4.8799
3	4.40	Nitrite	BMb	0.874	5.996	2.4183
4	5.08	Bromide	bMB	0.176	1.170	2.4771
5	5.59	Nitrate	BMB	1.059	6.389	2.4051
6	6.89	Sulfate	BMB	0.740	3.472	5.4013
			TOTAL:	5.07	34.49	22.61

101
98
97
99
96
108



ALS Environmental

Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Preparation Information Benchsheet

Prep Run: 233180
Team: Metals
Analyst: Keith Linn

Prep Workflow: MetDigSICP
Prep Method: EPA 3050B
Rush/NPDES: NPDES

Status: Prepped
Current Step: Digestion

Prep Date: 04/09/2015 10:15
Due Date: 04/23/2015
Hold Date: 09/20/2015

Lab Code	Client ID	Bottle #	Initial Amt	Initial Basis	Final Volume	Spike Amt	Spike ID	Comments
KQ1503409-02	Method Blank		1.00 g		100 mL			10% HNO3, 10% HCl
KQ1503409-01	Lab Control Sample		1.02 g		100 mL	1 g	69665	10% HNO3, 10% HCl
K1503503-001	SWSUMP-SOLIDS-040315	.01	3.03 g	As Received	100 mL			10% HNO3, 10% HCl
K1503521-001	WP-032415-W	.01	1.76 g	As Received	100 mL			10% HNO3, 10% HCl
K1503521-001: KQ1503409-03	Duplicate	.01	1.79 g	As Received	100 mL			10% HNO3, 10% HCl
K1503521-001: KQ1503409-04	Matrix Spike	.01	1.77 g	As Received	100 mL	1 mL 1 mL 1 mL 2 mL	78694 79195 80121 80122	10% HNO3, 10% HCl

6 Total Samples consisting of 2 Client Samples, 2 Client QC Samples, 2 Batch QC Samples associated with the current Prep Run.

Spiking Solutions

Name	Type	ID	Expires
K-MET SOIL CRM	Spike	69665	4/17/2015
K-MET SS1	Spike	80122	9/1/2015
K-MET SS3	Spike	78694	5/18/2015
K-MET SS4	Spike	80121	8/1/2015
K-MET SS5	Spike	79195	8/2/2015

Preparation Materials

Step	Name	ID
Digestion	K-MET 100ml Centrifuge Tube	76754
Digestion	K-MET HCL	77970
Digestion	K-MET HNO3	78450
Digestion	K-MET H2O2	78459
Digestion	Teflon Chips	80163

Preparation Hardware / Equipment

Step	Name	Property	Value	
Digestion	K-Balance-02	Date Checked	4/9/15	
Digestion	K-BlockDigester-07	Corrected Temperature	95	deg C
Digestion	K-BlockDigester-07	Correction Factor	0	deg C
Digestion	K-BlockDigester-07	Observed Temperature	95	deg C
Digestion	K-BlockDigester-07	Thermometer ID 1135503		NONE
Digestion	K-BlockDigester-07	Thermometer Location	13	NONE

Preparation Steps

Step	Started	Finished	By	Assisted By	Training?	Comments
Digestion	09-APR-15 10:15	09-APR-15 12:20	Keith Linn		N	

Comments

IR: 15 mins, SR: 30 mins, HClR: 15 mins.

Review

Reviewed by: _____ Date: 4/9/15

METALS SPIKING SOLUTIONS CONCENTRATIONS FORM

Solution Name	Element	mLs of 1000ppm Solution	Final Volume	Solution Conc. mg/L	Enter mls Added
K-MET SS1	HNO3	50.0	1000ml	-	
	Al	100*	1000ml	200	
	Ag	100*	1000ml	5	
	Ba	100*	1000ml	100	
	Be	100*	1000ml	5	
	Cd	100*	1000ml	5	
	Co	100*	1000ml	50	
	Cr	100*	1000ml	20	
	Cu	100*	1000ml	25	
	Fe	100*	1000ml	100	
	Pb	100*	1000ml	50	
*** Add after HNO3	Mn	100*	1000ml	50	
and before cas cal	Ni	100*	1000ml	50	
-14	Sb***	50	1000ml	50	
when making the	V	100*	1000ml	50	
solution	Zn	100*	1000ml	50	
K-MET SS2	HNO3	25.0	500ml	-	
	As	2.0	500ml	4	
	Cd	2.0	500ml	4	
	Pb	2.0	500ml	4	
	Se	2.0	500ml	4	
	Tl	2.0	500ml	4	
	Cu	2.0	500ml	4	
K-MET SS3	HNO3	25.0	500ml	-	
	As	50.0	500ml	100	
	Se	50.0	500ml	100	
	Tl	50.0	500ml	100	
	Hg	6	500	12	
K-MET SS4	HNO3	25	500ml	-	
	B	50	500ml	100	
	Mo	50	500ml	100	
K-MET SS5	HNO3	10.0	200ml	-	
	K**	20	200ml	1000	
	Na**	20	200ml	1000	
	Mg**	20	200ml	1000	
	Ca**	20	200ml	1000	
K-MET GFLCSW	HNO3	10.0	1000ml	-	
	As, Pb, Se, Tl	5.0	1000ml	2.5	
	Cd	-	-	1.25	
	Cu	2.5	1000ml	2.5	
K-MET QCP-CICV-1	Ca, Mg, Na, K	no dilution	-	2500	
	Al, Ba	no dilution	-	1000	
	Fe	no dilution	-	500	
	Co, Mn, Ni, V, Zn	no dilution	-	250	
	Cu, Ag	no dilution	-	125	
	Cr	no dilution	-	100	
	Be	no dilution	-	25	
K-MET QCP-CICV-2	Sb	no dilution	-	500	
K-MET QCP-CICV-3	As, Pb, Se, Tl	no dilution	-	500	
	Cd	no dilution	-	250	

* Denotes volume of mixed stock standard.

** Denotes 10,000 ppm individual stock standards.

Standard	mls of standard	ppm	Logbook #	Exp. Date

CVAA Mercury Data Review Form

K-CVAA-02

Element: Hg

Analysis Lot #: 040915B HG2

Starlims # 439843

Cal. STD/CCV Source: HG2-65-L

Service Request Numbers:

K1503408, K1503413, K1503503, K1503522, K1503564, K1503577, K1503624
K1503521

	Yes	No	NA
1) Appropriate standardization completed	X		
2) ICV within 10% of true value	X		
3) CCVs in control (+/- 10%)	X		
4) CCBs and or ICBs below MRL	X		
5) CCV/CCB check run every 10 samples	X		
6) All reported samples within calibration range	X		
7) Calculations correct	X		

Comments:

Data reviewed against service request(s) to ensure no samples were omitted: AEM (Initials)

Primary Reviewed By: AEM Date: 4/9/15

Secondary Reviewed By: JDB Date: 4/9/15

Data Review Form

Service Request #:	**K1503521**
Instrument ID#:	**K-CVAA-02**
DataFile Name:	**R:\ICP\WIP\DATA\K-CVAA-02 (QUICKTRACE)\040915B HG2.csv**
RUNNO:	**439843**

There are no issues to report.

Primary Approver: _____

Secondary Approver: JDS

CVAA Hg ANALYTICAL WORKSHEET

Method: (Circle One) 7470A 7471B 245.1	Service Request # :
Analysis For: Hg	

DATA

Pos.	SAMPLE NUMBER	Initial Sample (g) or (mL)	Initial Dilution (mL)	Dilution Factor	(µg/L) Measured	Sample Actual (mg/kg)	Sample Actual (µg/L)
1	Cal. Blk.	~	50	~	0.00		0.00
2	Std 0.2	*0.1	50	~	0.20		0.20
3	Std 0.5	*0.25	50	~	0.50		0.50
4	Std 1.0	*0.5	50	~	1.00		1.00
5	Std 5.0	*2.5	50	~	5.00		5.00
6	Std 10.0	*5.0	50	~	10.00		10.00
7	ICV1	**0.25	50	~	4.980		100%
8	ICB1	~	50	~	0.001		0.001
9	LLICV1	*0.1	50	~	0.191		96%
10	CCV1	*2.5	50	~	5.080		102%
11	CCB1	~	50	~	0.003		0.003
12	KQ1503430-03	0.544	50	~	0.012	0.001	
13	KQ1503430-01	~	50	~	4.960		99%
14	KQ1503430-02	0.250	50	50	1.940	19.400	97%
15	K1503408-008	0.548	50	~	0.316	0.029	
16	K1503408-008D	0.544	50	~	0.263	0.024	
17	K1503408-008S	0.546	50	~	5.010	0.459	94%
18	K1503413-008	0.548	50	~	0.260	0.024	
19	K1503503-001	0.926	50	~	1.750	0.094	
20	~~K1503521-001~~	~~0.545~~	~~50~~	~	~~14.000~~	~~1.284~~	
21	~~K1503521-001D~~	~~0.555~~	~~50~~	~	~~11.600~~	~~1.045~~	
22	CCV2	*2.5	50	~	5.090		102%
23	CCB2	~	50	~	0.004		0.004
24	~~K1503521-001S~~	~~0.549~~	~~50~~	~	~~14.900~~	~~1.357~~	
25	K1503522-002	0.606	50	~	0.034	0.003	

AEM 4/9/15

AEM 4/9/15

Comments: Cal. Inter. Std*_(100ppb)__HG2-65-L_
2nd Source Inter Std**_(1ppm)_HG2-64-Y_

Soil/Tissue Spike Level: K1503408-008S=0.458 mg/kg

Method	Spike Level	MRL	LCS Limit	MS Limit	RPD	Post-Spike @ 5ppb
7470A Water	1.0 µg/L	0.2 µg/L	80-120%	75-125%	20%	+/- 20%
245.1 Water	1.0 µg/L	0.2 µg/L	85-115%	70-130%	20%	+/- 20%
7470A TCLP	5.0 µg/L	1.0 µg/L	80-120%	75-125%	20%	+/- 20%
7471A Soil LCSS	19.9mg/kg	0.02 mg/kg	48-137%	80-120%	20%	+/- 20%
7471A Tissue Tort	0.292 mg/kg	0.02 mg/kg	74-129%	80-120%	20%	+/- 20%

Analyst:	Date: 4/9/15	Page Number:

CVAA Hg ANALYTICAL WORKSHEET

Method: (Circle One) 7470A 7471B 245.1	Service Request # :
Analysis For: Hg	

DATA

Pos.	SAMPLE NUMBER	Initial Sample (g) or (mL)	Initial Dilution (mL)	Dilution Factor	(µg/L) Measured	Sample Actual (mg/kg)	Sample Actual (µg/L)
26	K1503522-003	0.635	50	~	0.041	0.003	
27	K1503522-004	0.691	50	~	0.054	0.004	
28	K1503522-005	0.687	50	~	0.038	0.003	
29	K1503564-001	0.528	50	~	1.570	0.149	
30	K1503577-001	2.513	50	~	0.177	0.004	
31	K1503624-001	0.530	50	~	0.004	0.000	
32	K1503624-002	0.537	50	~	0.011	0.001	
33	K1503624-003	0.526	50	~	0.001	0.000	
34	CCV3	*2.5	50	~	5.090		102%
35	CCB3	~	50	~	-0.002		-0.002
36	K1503624-004	0.515	50	~	0.005	0.000	
37	K1503624-005	0.518	50	~	0.005	0.000	
38	K1503521-001 5	0.545	50	5	2.310	1.060	
39	K1503521-001A 5	~	50	5	7.170		97%
40	K1503521-001D 5	0.555	50	5	2.260	1.018	2%
41	K1503521-001S 5	0.549	50	5	3.320	1.512	99%
42	K1503522-002A	~	50	~	4.780		95%
43	K1503521-001L 5	0.545	50	25	0.484		5%
44	CCV4	*2.5	50	~	5.220		104%
45	CCB4	~	50	~	0.004		0.004
46							
47							
48							
49							
50							

Comments:

Soil/Tissue Spike Level: K1503521-001S=0.455 mg/kg

Method	Spike Level	MRL	LCS Limit	MS Limit	RPD	Post-Spike @ 5pub
7470A Water	1.0 µg/L	0.2 µg/L	80-120%	75-125%	20%	+/- 20%
245.1 Water	1.0 µg/L	0.2 µg/L	85-115%	70-130%	20%	+/- 20%
7470A TCLP	5.0 µg/L	1.0 µg/L	80-120%	75-125%	20%	+/- 20%
7471A Soil LCSS	19.9mg/kg	0.02 mg/kg	48-137%	80-120%	20%	+/- 20%
7471A Tissue Tort	0.292 mg/kg	0.02 mg/kg	74-129%	80-120%	20%	+/- 20%

Analyst:	Date: 4/9/15	Page Number: 2

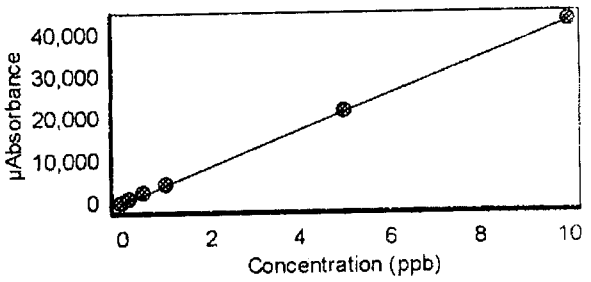
Report Generated By CETAC QuickTrace
Analyst: alkls.alklsxp196
Worksheet file: C:\Program Files\QuickTrace\Worksheets\040915B HG2.wsz
Date Started: 4/9/2015 11:46:18 AM
Comment:

Results

Sample Name					Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags
Calibration Blank					STD	04/09/15 01:05:16 pm	0.000	-11	374.7	
Replicates	45.7	-11.8	-45.1	-31.6						
Standard #1					STD	04/09/15 01:06:52 pm	0.200	867	0.52	
Replicates	860.1	868.6	870.4	867.6						
Standard #2					STD	04/09/15 01:08:29 pm	0.500	2148	0.96	
Replicates	2126.6	2173.8	2152.7	2136.9						
Standard #3					STD	04/09/15 01:10:07 pm	1.000	4349	0.36	
Replicates	4349.5	4356.6	4363.6	4327.4						
Standard #4					STD	04/09/15 01:11:45 pm	5.000	21698	0.56	
Replicates	21717.4	21810.9	21738.8	21524.3						
Standard #5					STD	04/09/15 01:13:24 pm	10.000	42812	0.45	
Replicates	42716.2	42899.7	43030.3	42601.3						

Calibration

Equation: A = -10.692 + 4294.740C
R2: 0.99994
SEE: 158.5925
Flags:



ICV1					ICV	04/09/15 01:15:03 pm	4.980	21361	0.37	
Replicates	21307.0	21426.3	21432.6	21278.7						
% Recovery	99.53									
ICB1					ICB	04/09/15 01:16:39 pm	0.001	-7	373.23	
Replicates	-9.8	26.7	-32.4	-10.8						

Sample Name					Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags
LLICV1					CRDL	04/09/15 01:18:16 pm	0.191	809	1.89	
Replicates	818.3	798.3	794.4	825.9						
% Recovery	95.46									
CCV1					CCV	04/09/15 01:19:54 pm	5.080	21810	0.44	
Replicates	21760.5	21861.4	21915.9	21703.6						
% Recovery	101.62									
CCB1					CCB	04/09/15 01:21:30 pm	0.003	1	975.45	
Replicates	3.6	-4.2	33.6	-29.5						
KQ1503430-03					UNK	04/09/15 01:23:05 pm	0.012	39	63.86	
Replicates	75.0	21.7	22.2	37.7						
KQ1503430-01					UNK	04/09/15 01:24:41 pm	4.960	21306	0.66	
Replicates	21269.0	21415.1	21417.0	21122.0						
KQ1503430-02					UNK	04/09/15 01:26:18 pm	1.940	8321	0.29	
Replicates	8291.2	8349.1	8326.8	8318.3						
K1503408-008					UNK	04/09/15 01:27:54 pm	0.316	1346	1.66	
Replicates	1323.9	1332.4	1372.8	1356.3						
K1503408-008D					UNK	04/09/15 01:29:31 pm	0.263	1119	3.03	
Replicates	1086.0	1150.6	1094.4	1146.5						
K1503408-008S					UNK	04/09/15 01:31:08 pm	5.010	21496	0.31	
Replicates	21455.1	21560.5	21543.5	21425.7						
K1503413-008					UNK	04/09/15 01:32:46 pm	0.260	1106	2.22	
Replicates	1086.5	1091.8	1106.3	1140.9						
K1503503-001					UNK	04/09/15 01:34:24 pm	1.750	7495	0.59	
Replicates	7517.0	7526.2	7506.4	7429.0						
~~K1503521-001~~					~~UNK~~	~~04/09/15 01:36:02 pm~~	~~14.000~~	~~60059~~	~~0.60~~	~~O~~
Replicates	60120.0	60293.3	60286.9	59535.3						

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Sample Name					Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags
~~K1503521-001D~~					~~UNK~~	~~04/09/15 01:38:49 pm~~	~~11.600~~	~~49719~~	~~0.50~~	~~O~~
Replicates	49741.6	49874.7	49895.9	49361.8						
CCV2					CCV	04/09/15 01:40:27 pm	5.090	21830	0.48	
Replicates	21741.2	21912.8	21927.6	21736.5						
% Recovery	101.71									
CCB2					CCB	04/09/15 01:42:03 pm	0.004	6	288.06	
Replicates	-14.6	11.5	25.3	1.2						
~~K1503521-001S~~					~~UNK~~	~~04/09/15 01:43:42 pm~~	~~14.900~~	~~64153~~	~~0.66~~	~~O~~
Replicates	64200.0	64434.0	64434.3	63544.9						
K1503522-002					UNK	04/09/15 01:46:20 pm	0.034	136	7.24	
Replicates	133.1	135.2	125.1	148.7						
K1503522-003					UNK	04/09/15 01:47:55 pm	0.041	163	13.50	
Replicates	173.5	165.0	131.8	182.2						
K1503522-004					UNK	04/09/15 01:49:31 pm	0.054	221	16.96	
Replicates	228.5	267.8	177.3	212.3						
K1503522-005					UNK	04/09/15 01:51:07 pm	0.038	154	7.71	
Replicates	170.9	146.2	145.2	154.7						
K1503564-001					UNK	04/09/15 01:52:43 pm	1.570	6721	0.67	
Replicates	6723.5	6718.7	6775.7	6665.2						
K1503577-001					UNK	04/09/15 01:54:19 pm	0.177	747	3.23	
Replicates	778.9	750.6	738.0	721.9						
K1503624-001					UNK	04/09/15 01:55:56 pm	0.004	6	486.35	
Replicates	-7.7	6.4	43.6	-19.7						
K1503624-002					UNK	04/09/15 01:57:33 pm	0.011	39	55.24	
Replicates	7.8	54.6	51.1	40.9						

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Sample Name					Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags
K1503624-003					UNK	04/09/15 01:59:11 pm	0.001	-6	332.70	
Replicates	4.3	-21.4	-24.7	17.3						
CCV3					CCV	04/09/15 02:00:49 pm	5.090	21834	0.31	
Replicates	21848.5	21880.0	21873.6	21732.6						
% Recovery	101.73									
CCB3					CCB	04/09/15 02:02:25 pm	-0.002	-19	66.27	
Replicates	-7.6	-36.1	-20.0	-12.0						
K1503624-004					UNK	04/09/15 02:04:02 pm	0.005	10	152.90	
Replicates	30.2	1.8	11.6	-4.2						
K1503624-005					UNK	04/09/15 02:05:40 pm	0.005	9	241.12	
Replicates	-16.4	6.2	10.3	34.6						
K1503521-001 5					UNK	04/09/15 02:08:09 pm	2.310	9897	0.55	
Replicates	9919.5	9925.7	9928.4	9815.4						
K1503521-001A 5					UNK	04/09/15 02:09:47 pm	7.170	30777	0.48	
Replicates	30767.5	30875.0	30896.2	30569.8						
K1503521-001D 5					UNK	04/09/15 02:11:23 pm	2.260	9693	0.47	
Replicates	9655.0	9759.1	9678.3	9680.3						
K1503521-001S 5					UNK	04/09/15 02:12:59 pm	3.320	14265	0.46	
Replicates	14326.9	14299.8	14258.4	14175.8						
K1503522-002A					UNK	04/09/15 02:14:35 pm	4.780	20521	0.32	
Replicates	20491.5	20546.4	20600.0	20447.5						
K1503521-001L 5					UNK	04/09/15 02:21:03 pm	0.484	2068	0.82	
Replicates	2046.7	2088.2	2069.7	2066.1						
CCV4					CCV	04/09/15 02:22:41 pm	5.220	22394	0.87	
Replicates	22540.5	22498.6	22424.6	22112.5						
% Recovery	104.34									

Sample Name					Type	Date/Time	Conc (ppb)	µAbs	%RSD	Flags
CCB4					CCB	04/09/15 02:24:17 pm	0.004	6	722.46	
	Replicates	-26.5	-2.2	64.7	-13.5					

Preparation Information Benchsheet

Prep Run: 233225
Team: Metals
Analyst: AMCKORNEY
Prep Workflow: HgDigS
Prep Method: Method
Rush/NPDES: NPDES
Status: Prepped
Current Step: Digestion
Prep Date: 04/09/2015 11:20
Due Date: 04/13/2015
Hold Date: 04/21/2015

Lab Code	Client ID	Bottle #	Initial Amt	Initial Basis	Final Volume	Spike Amt	Spike ID	
KQ1503430-03	Method Blank		0.544 g	AS RECEIVED	50 mL			
KQ1503430-01	Lab Control Sample		g	AS RECEIVED	50 mL	0.25 mL	80040	
KQ1503430-02	Lab Control Sample		0.250 g	AS RECEIVED	50 mL	0.25 g	69665	
K1503408-008	Composite	.06	0.548 g	COMPOSITE	50 mL			
K1503408-008: KQ1503430-04	Duplicate	.06	0.544 g	COMPOSITE	50 mL			
K1503408-008: KQ1503430-05	Matrix Spike	.06	0.546 g	COMPOSITE	50 mL	0.25 mL	80040	
K1503413-008	Composite	.07	0.548 g	COMPOSITE	50 mL			
K1503503-001	SWSUMP-SOLIDS-040315	.02	0.926 g	AS RECEIVED	50 mL			
K1503521-001	WP-032415-W	.02	0.545 g	AS RECEIVED	50 mL			
K1503521-001: KQ1503430-06	Duplicate	.02	0.555 g	AS RECEIVED	50 mL			
K1503521-001: KQ1503430-07	Matrix Spike	.02	0.549 g	AS RECEIVED	50 mL	0.25 mL	80040	
K1503522-002	NW Composite	.01	0.606 g	AS RECEIVED	50 mL			
K1503522-003	NE Composite	.01	0.635 g	AS RECEIVED	50 mL			
K1503522-004	SW Composite	.01	0.691 g	AS RECEIVED	50 mL			
K1503522-005	SE Composite	.01	0.687 g	AS RECEIVED	50 mL			
K1503564-001	AB16387	.02	0.528 g	AS RECEIVED	50 mL			
K1503577-001	Digester #2	.01	2.513 g	AS RECEIVED	50 mL			
K1503624-001	1413182.1	.01	0.530 g	AS RECEIVED	50 mL			
K1503624-002	1413182.2	.01	0.537 g	AS RECEIVED	50 mL			
K1503624-003	1413182.3	.01	0.526 g	AS RECEIVED	50 mL			
K1503624-004	1413182.4	.01	0.515 g	AS RECEIVED	50 mL			
K1503624-005	1413182.5	.01	0.518 g	AS RECEIVED	50 mL			

22 Total Samples consisting of 15 Client Samples, 4 Client QC Samples, 3 Batch QC Samples associated with the current Prep Run.

Spiking Solutions

Name	Type	ID	Expires	Name	Type	ID	Expires
K-MET Hg Source Standard 1000 ug/L	Spike	80040	5/1/2015	K-MET SOIL CRM	Spike	69665	4/17/2015

Preparation Materials

Step	Name	ID	Step	Name	ID
Digestion	K-MET NACl Hg	75966	Digestion	K-MET KMnO4 Hg	77588
Digestion	K-MET SnCl Hg	75968	Digestion	K-MET NH2OH-HCl Hg	78685
Digestion	K-MET 100ml Centrifuge Tube	76520	Digestion	K-MET HNO3 Hg	78792
Digestion	K-MET HCl Hg	77584	Digestion	Teflon Chips	80163

Preparation Hardware / Equipment

Step	Name	Property	Value		Step	Name	Property	Value	
Digestion	K-Balance-37	Date Calibrated	04/09/15		Digestion	K-BlockDigester-03	Observed Temperature	95	deg C
Digestion	K-BlockDigester-03	Correction Factor	0	deg C	Digestion	K-BlockDigester-03	Thermometer ID 1134911		NONE
Digestion	K-BlockDigester-03	Corrected Temperature	95	deg C	Digestion	K-BlockDigester-03	Thermometer Location	25	NONE

Preparation Steps

Step	Started	Finished	By	Assisted By	Training?	Comments
Digestion	09-APR-15 11:20	09-APR-15 11:50	AMCKORNEY		N	

Comments

CAL. STD/CCV SOURCE: HG2-65-L

Review

Reviewed by: JDB Date: 4/9/15

Preparation Information Benchsheet

Prep Run: 233225 **Prep Workflow:** HgDigS **Status:** Draft **Prep Date** 04/09/2015 08:49
Team: Metals **Prep Method:** Method **Current Step:** Digestion **Due Date:** 04/13/2015
Analyst: AMCKORNEY **Rush/NPDES:** NPDES **Hold Date:** 04/21/2015

Lab Code	Client ID	Bottle #	Target Amt	Initial Amt	Initial Basis	Final Volume	Spike Amt	Spike ID	Final Amt
KQ1503430-03	Method Blank		0.5 g						0.544
KQ1503430-01	Lab Control Sample		0.5 g				0.25 mL	30040	NA
KQ1503430-02	Lab Control Sample		0.5 g				0.25 g	69665	0.250
K1503408-008	Composite	.06	0.5 g						0.548
K1503408-008: KQ1503430-04	Duplicate	.06	0.5 g						0.544
K1503408-008: KQ1503430-05	Matrix Spike	.06	0.5 g				0.25 mL	30040	0.546
K1503413-008	Composite	.07	0.5 g						0.548
K1503503-001	SWSUMP-SOLIDS-040315	.02	0.5 g						0.926
K1503521-001	WP-032415-W	.02	0.5 g						0.545
K1503521-001: KQ1503430-06	Duplicate	.02	0.5 g						0.555
K1503521-001: KQ1503430-07	Matrix Spike	.02	0.5 g				0.25 mL	30040	0.549
K1503522-002	NW Composite	.01	0.5 g						0.606
K1503522-003	NE Composite	.01	0.5 g						0.635
K1503522-004	SW Composite	.01	0.5 g						0.691
K1503522-005	SE Composite	.01	0.5 g						0.687
K1503564-001	AB16387	.02	0.5 g						0.528
K1503577-001	Digester #2	.01	0.5 g						2.513
K1503624-001	1413182.1	.01	0.5 g						0.530
K1503624-002	1413182.2	.01	0.5 g						0.537
K1503624-003	1413182.3	.01	0.5 g						0.526
K1503624-004	1413182.4	.01	0.5 g						0.515
K1503624-005	1413182.5	.01	0.5 g						0.518

22 Total Samples consisting of 15 Client Samples, 4 Client QC Samples, 3 Batch QC Samples associated with the current Prep Run.

Spiking Solutions

Name	Type	ID	Expires	Name	Type	ID	Expires

11:20

K-MET Hg Source Standard 1000 ug/L	Spike	80040	5/1/2015	K-MET SOIL CRM	Spike	69665	4/17/2015

Preparation Materials

Step	Name	ID
Digestion	K-MET NACl Hg	75966
Digestion	K-MET SnCl Hg	75968
Digestion	K-MET 100ml Centrifuge Tube	76520
Digestion	K-MET HCl Hg	77584
Digestion	K-MET KMnO4 Hg	77588
Digestion	K-MET NH2OH-HCl Hg	78685
Digestion	K-MET HNO3 Hg	78792
Digestion	Teflon Chips	80163

Preparation Hardware / Equipment

Step	Name	Property	Value
Digestion	K-Balance-37	Date Calibrated	
Digestion	K-BlockDigester-03	Correction Factor	deg C
Digestion	K-BlockDigester-03	Corrected Temperature	deg C
Digestion	K-BlockDigester-03	Observed Temperature	deg C
Digestion	K-BlockDigester-03	Thermometer ID 1134911	NONE
Digestion	K-BlockDigester-03	Thermometer Location	75 NONE

Preparation Steps

Step	Started	Finished	By	Assisted By	Training?	Comments
Digestion						

Comments

Service Request # K1503521
Instrument ID# K-ICP-AES-03

ICP-OES 6010 Data Review Form

		Yes	No
1.	Standardization completed	X	
2.	ICV within 10 % of true value	X	
3.	ICB below MRL	X	
4.	CRI/LLICV standard analyzed.	X	
5.	ICS standards within 20% of true value	X	
6.	All preceding CCVs within 10 % of true value	X	
7.	Following CCV within 10 % of true value	X	
8.	Bracketing CCBs below MRL	X	
9.	Method Blank below MRL		X ①
10.	MS (75-125), Dup (20) and LCS (80-120) within control limits		X ②
11.	All analytes within instrument linear range	X	
12.	Adequate rinse out time allowed between samples to eliminate memory effect	X	
13.	Run terminated early		X

Comments: Non-homogeneous sample
StarLIMS Run 440349 Saved under 041415AICP03
6010C: Raise MRL As =0.02ppm.
① MB: As=0.0370, sample>20X
② High RPDs: Al=25%, Fe=23%
LS: Al=131%, post spike okay

Primary Review by [illegible] Date 4/14/15

Secondary Review by [illegible] Date 4/15/15

Data Review Form

Service Request #: **K1503521**
Instrument ID#: **K-ICP-AES-03**
DataFile Name: **R:\ICP\WIP\DATA\K-ICP-AES-03 (6500)\041415AICP03.txt**
RUNNO: **440349**

K1503521-001DUP - Metals T

DUP RPD

Spec 71814 v. 6 - Al3944 - RPD: 24 Limit: 20
Spec 71814 v. 6 - Fe2599 - RPD: 22 Limit: 20 Non homogeneous sample

K1503521-001MS - Metals T

MS Recovery

Spec 71814 v. 6 - Al3944 - Recovery: 130 Limits: 75 - 125 post-spike okay

Analytical Method 6010C

Primary Approver: AW 4/15/15
Secondary Approver: [illegible] 4/15/15

Sample Name: BLK Acquired: 4/14/2015 8:55:26 Type: Cal
Method: 2015A-ICP03(v75) Mode: IR Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0003	-19.73	1.271	2.559	.0178	-6.2620	-3.620
Stddev	.0002	1.33	.125	.216	.0009	2.9363	4.837
%RSD	48.76	6.756	9.857	8.438	5.044	46.890	133.6
#1	.0002	-20.67	1.359	2.712	.0184	-8.3383	-7.040
#2	.0004	-18.79	1.182	2.407	.0172	-4.1858	-.1993

Elem	Cd2144	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-.0004	-.0004	.0027	.2806	.0000	.0006	-.0002
Stddev	.0002	.0004	.0017	.0005	.0001	.0003	.0005
%RSD	49.85	91.80	63.46	.1922	5090.	46.49	286.4
#1	-.0003	-.0002	.0015	.2802	.0000	.0004	-.0005
#2	-.0005	-.0007	.0039	.2810	.0000	.0008	.0002

Elem	Cu3273	Fe2599	Pb2203	Li6707	Mg2790	Mg2795	Mg2852
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	-163.0	-.0006	-.0003	-19.39	-.0003	.0019	-7.125
Stddev	1.4	.0003	.0004	4.82	.0002	.0008	1.874
%RSD	.8545	44.90	155.2	24.87	73.83	43.25	26.30
#1	-162.0	-.0008	.0000	-22.80	-.0005	.0013	-5.800
#2	-163.9	-.0004	-.0005	-15.98	-.0002	.0024	-8.450

Elem	Mn2576	Mn2605	Mo2020	Ni2216	P_1782	K_7664	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0000	-.0001	.0005	.0009	.0000	7.630	.4437
Stddev	.000	.0000	.0002	.0000	.0001	2.722	1.006
%RSD	80.66	3.113	35.49	3.130	400.7	35.68	226.8
#1	.0000	.0000	.0004	.0009	-.0001	9.555	-.2679
#2	.0000	-.0001	.0006	.0010	.0001	5.705	1.155

Sample Name: BLK Acquired: 4/14/2015 8:55:26 Type: Cal
Method: 2015A-ICP03(v75) Mode: IR Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Si2516	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	5.515	-22.29	-.3795	-.00378	-.0001	.0002	.0013
Stddev	3.267	2.72	7.839	.00000	.0000	.0001	.0001
%RSD	59.25	12.20	2065.	.03438	.5411	37.76	4.830
#1	7.825	-20.37	5.164	-.00378	-.0001	.0002	.0014
#2	3.204	-24.22	-5.923	-.00378	-.0001	.0003	.0013

Elem	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.0003	.0000	1.810	.0012	1.066
Stddev	.0000	.000	.718	.0001	.186
%RSD	5.872	2953.	39.66	7.140	17.42
#1	.0003	.0003	2.317	.0012	.9346
#2	.0003	-.0003	1.302	.0011	1.197

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2873.3	78349.	4430.0
Stddev	16.5	348.	22.5
%RSD	.57406	.44462	.50885
#1	2861.6	78595.	4445.9
#2	2885.0	78103.	4414.0

GM
4/14/15
4/15/15

Sample Name: STD A Acquired: 4/14/2015 8:57:54 Type: Cal
Method: 2015A-ICP03(v75) Mode: IR Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-70-A

Elem	Al1670	Sb2068	Be2348	B_2496	Cd2144	Cd2265	Ca3933	Cr2677
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.3304	231.2	24012.	2058.	2.412	1.962	22.52	.0768
Stddev	.0016	.1	8.	11.	.006	.007	.00	.0002
%RSD	.4791	.0565	.03395	.5124	.2402	.3621	.0021	.2314
#1	.3293	231.2	24018.	2066.	2.408	1.957	22.52	.0769
#2	.3315	231.3	24006.	2051.	2.416	1.967	22.52	.0766

Elem	Co2307	Cu2247	Cu3273	Pb2203	Mg2795	Mn2576	Mo2020	Ni2216
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.8097	.4447	8645.	.1590	3.597	.4112	.5987	.7661
Stddev	.0007	.0012	25.	.0003	.001	.0018	.0006	.0024
%RSD	.0863	.2761	.2864	.2152	.0145	.4443	.0980	.3130
#1	.8092	.4439	8663.	.1587	3.597	.4100	.5983	.7644
#2	.8102	.4456	8628.	.1592	3.597	.4125	.5992	.7678

Elem	Se1960	Ag3280	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	150.3	8549.	.1182	.1290	.3644	.0943	.6432	5396.
Stddev	.6	5.	.0006	.0006	.0003	.0004	.0038	6.
%RSD	.4008	.0604	.4868	.4599	.0943	.4200	.5868	.1095
#1	150.7	8546.	.1178	.1286	.3646	.0940	.6406	5400.
#2	149.8	8553.	.1186	.1294	.3641	.0945	.6459	5392.

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2876.5	79432.	4553.5
Stddev	6.0	125.	32.5
%RSD	.20987	.15739	.71467
#1	2880.8	79520.	4576.5
#2	2872.2	79343.	4530.5

Sample Name: STD B Acquired: 4/14/2015 9:00:04 Type: Cal
Method: 2015A-ICP03(v75) Mode: IR Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-74-K

Elem	Al3944	As1890	Ba4554	Ca3158	Fe2599	Li6707	Mg2790
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	104100.	570.9	162.6	2.293	3.506	13270.	.4617
Stddev	1356.	2.5	2.1	.007	.010	42.	.0029
%RSD	1.303	.4425	1.312	.3046	.2847	.3181	.6304
#1	103100.	572.6	161.1	2.298	3.513	13240.	.4637
#2	105100.	569.1	164.1	2.288	3.498	13300.	.4596

Elem	Mg2852	Mn2605	P_1782	K_7664	Si2516	Na5895	Sr4077
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	36160.	.0503	1.932	8048.	5586.	26170.	28.851
Stddev	232.	.0001	.001	5.	24.	138.	.015
%RSD	.6421	.2800	.0567	.0589	.4352	.5277	.05345
#1	36000.	.0502	1.933	8051.	5569.	26070.	28.862
#2	36330.	.0504	1.931	8045.	5603.	26270.	28.841

Elem	Bi2230	S_1820
Units	Cts/S	Cts/S
Avg	.4918	382.7
Stddev	.0008	1.6
%RSD	.1700	.4060
#1	.4912	383.8
#2	.4924	381.6

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2809.8	75875.	4434.0
Stddev	7.1	303.	28.0
%RSD	.25185	.39965	.63212
#1	2814.8	75661.	4414.2
#2	2804.8	76090.	4453.9

Sample Name: ICVB Acquired: 4/14/2015 9:02:39 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-75-A

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.9836	1.051	-.0006	.0033	.0006	-.00003	1.969	.0000
Stddev	.0008	.001	.0000	.0011	.0001	.00004	.005	.000
%RSD	.0792	.0814	6.108	34.04	10.24	133.11	.2384	99.71
#1	.9842	1.050	-.0006	.0025	.0007	-.00006	1.972	.0000
#2	.9831	1.051	-.0006	.0041	.0006	.00000	1.966	.0000
Check ?	Chk Pass	None	None	None	None	None	Chk Pass	None
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	4.979	4.872	.0000	.0006	.0000	.0004	10.02
Stddev	.0000	.012	.014	.000	.0001	.000	.0006	.06
%RSD	25.89	.2447	.2952	42.82	15.05	4491.	165.9	.5675
#1	-.0001	4.970	4.882	.0000	.0006	.0001	.0008	10.07
#2	-.0001	4.987	4.862	.0000	.0007	-.0001	-.0001	9.985
Check ?	None	None	Chk Pass	None	None	None	None	None
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	1.966	4.997	4.956	5.095	9.707	9.899	.0002
Stddev	.0006	.003	.051	.003	.017	.102	.060	.0004
%RSD	429.5	.1349	1.010	.0609	.3295	1.054	.6053	142.3
#1	-.0003	1.964	5.033	4.958	5.083	9.779	9.857	.0005
#2	.0006	1.968	4.962	4.954	5.107	9.635	9.941	.0000
Check ?	None	Chk Pass	None	Chk Pass	None	None	Chk Pass	None
Value								
Range								

Sample Name: ICVB Acquired: 4/14/2015 9:02:39 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-75-A

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0007	4.997	.0247	.0012	4.985	.0002	13.65	1.9442
Stddev	.0004	.015	.0047	.0019	.042	.0001	.01	.0070
%RSD	49.82	.2984	18.86	164.3	.8380	59.59	.1066	.36001
#1	.0010	5.008	.0214	-.0002	4.956	.0001	13.64	1.9491
#2	.0005	4.987	.0280	.0026	5.015	.0003	13.66	1.9392
Check ?	None	Chk Pass	None	None	Chk Pass	None	None	Chk Pass
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0017	4.989	.0000	.0068	.0003	.0003	5.150	5.040
Stddev	.0005	.000	.0002	.0003	.0000	.0003	.015	.003
%RSD	30.30	.0024	757.2	5.030	.0050	113.3	.2898	.0571
#1	-.0020	4.989	.0002	.0065	.0003	.0001	5.160	5.042
#2	-.0013	4.989	-.0001	.0070	.0003	.0005	5.139	5.038
Check ?	None	Chk Pass	None	None	None	None	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2857.1	77668.	4471.8
Stddev	2.3	44.	54.4
%RSD	.08032	.05714	1.2160
#1	2855.4	77637.	4433.4
#2	2858.7	77699.	4510.3

Sample Name: ICV Acquired: 4/14/2015 9:07:02 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-78-C

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.328	5.045	2.398	2.517	4.974	.12379	.0020	1.244
Stddev	.012	.022	.001	.005	.000	.00020	.0001	.001
%RSD	.2841	.4386	.0245	.2025	.0075	.16008	6.416	.0554
#1	4.337	5.061	2.398	2.513	4.974	.12393	.0021	1.245
#2	4.320	5.030	2.398	2.520	4.975	.12365	.0020	1.244
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.231	12.35	11.93	.5011	1.217	.6025	.5929	2.486
Stddev	.002	.01	.01	.0000	.001	.0003	.0020	.007
%RSD	.1208	.0647	.0748	.0054	.0826	.0470	.3292	.2665
#1	1.232	12.36	11.94	.5011	1.218	.6027	.5943	2.491
#2	1.230	12.35	11.93	.5011	1.216	.6023	.5915	2.482
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.405	.0019	12.49	11.89	12.45	1.242	1.238	2.007
Stddev	.004	.0004	.01	.05	.05	.003	.013	.001
%RSD	.1795	21.44	.1126	.3858	.3779	.2619	1.078	.0237
#1	2.402	.0022	12.50	11.86	12.42	1.240	1.228	2.008
#2	2.409	.0016	12.48	11.92	12.49	1.244	1.247	2.007
Check ?	Chk Pass	None	Chk Pass	None	Chk Pass	Chk Pass	None	Chk Pass
Value								
Range								

NR- see rerun
GM
4/14/15

Sample Name: ICV Acquired: 4/14/2015 9:07:02 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-78-C

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.220	.0008	12.51	2.473	-.1334	F .5900	12.50	.00036
Stddev	.000	.0001	.03	.005	.0091	.0033	.05	.00004
%RSD	.0310	7.670	.2232	.2038	6.844	.5634	.4040	12.004
#1	1.220	.0008	12.49	2.469	-.1399	.5923	12.46	.00033
#2	1.220	.0009	12.53	2.476	-.1269	.5876	12.54	.00039
Check ?	Chk Pass	None	Chk Pass	Chk Pass	None	Chk Fail	Chk Pass	None
Value						.6250		
Range						-5.440%		

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.452	.0011	F 1.839	1.260	1.221	1.206	.0083	.0003
Stddev	.000	.0007	.004	.002	.004	.004	.0017	.0023
%RSD	.0057	61.79	.1941	.1783	.3256	.3545	20.80	752.9
#1	2.452	.0006	1.836	1.258	1.224	1.203	.0071	.0019
#2	2.452	.0016	1.841	1.261	1.218	1.209	.0096	-.0013
Check ?	Chk Pass	None	Chk Fail	Chk Pass	Chk Pass	Chk Pass	None	None
Value			2.000					
Range			-5.440%					

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2829.7	76462.	4435.0
Stddev	7.4	329.	10.0
%RSD	.26291	.43043	.22455
#1	2824.5	76695.	4428.0
#2	2835.0	76229.	4442.0

NR-see rerun
aw
4/14/15

Sample Name: ICV Acquired: 4/14/2015 9:09:54 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-78-C RERUN

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.334	5.040	2.419	2.524	4.976	.12449	.0002	1.241
Stddev	.004	.002	.004	.002	.022	.00043	.0001	.001
%RSD	.1041	.0439	.1726	.0882	.4344	.34363	33.33	.0615
#1	4.337	5.041	2.416	2.525	4.991	.12419	.0001	1.240
#2	4.331	5.038	2.422	2.522	4.961	.12480	.0002	1.241
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass
Value Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.231	12.48	12.01	.5038	1.215	.6027	.5933	2.497
Stddev	.004	.04	.19	.0008	.001	.0010	.0005	.003
%RSD	.2909	.3151	1.542	.1634	.0950	.1598	.0864	.1198
#1	1.228	12.51	12.14	.5044	1.216	.6034	.5930	2.495
#2	1.234	12.45	11.88	.5032	1.215	.6020	.5937	2.499
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.409	-.0014	12.57	11.87	12.56	1.254	1.243	2.010
Stddev	.011	.0008	.13	.02	.01	.002	.010	.003
%RSD	.4532	55.24	1.034	.1589	.1168	.1458	.7808	.1386
#1	2.401	-.0008	12.66	11.89	12.57	1.252	1.250	2.012
#2	2.417	-.0019	12.48	11.86	12.55	1.255	1.236	2.008
Check ?	Chk Pass	None	Chk Pass	None	Chk Pass	Chk Pass	None	Chk Pass
Value Range								

Sample Name: ICV Acquired: 4/14/2015 9:09:54 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-78-C RERUN

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.214	-.0014	12.60	2.476	-.1283	.5976	12.54	.00034
Stddev	.000	.0014	.03	.003	.0025	.0003	.04	.00001
%RSD	.0091	95.20	.2268	.1182	1.952	.0502	.3228	2.3747
#1	1.215	-.0005	12.62	2.474	-.1301	.5978	12.56	.00034
#2	1.214	-.0024	12.58	2.478	-.1265	.5974	12.51	.00035
Check ?	Chk Pass	None	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	None
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.450	.0009	F 1.848	1.269	1.220	1.206	.0096	-.0008
Stddev	.007	.0002	* .002	.003	.000	.003	.0012	.0007
%RSD	.2947	19.70	.1323	.2659	.0307	.2051	12.07	93.85
#1	2.445	.0010	1.846	1.266	1.220	1.204	.0087	-.0003
#2	2.455	.0008	1.850	1.271	1.220	1.208	.0104	-.0013
Check ?	Chk Pass	None	Chk Fail	Chk Pass	Chk Pass	Chk Pass	None	None
Value			2.000					
Range			-5.440%					

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2835.5	76667.	4454.5
Stddev	4.8	15.	20.0
%RSD	.17069	.01947	.44795
#1	2832.0	76656.	4440.4
#2	2838.9	76677.	4468.6

*NR for 200.7
ok for 6010
GM
4/14/15

Sample Name: ICB Acquired: 4/14/2015 9:13:56 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0001	.0131	.0019	.0003	-.00004	-.0009	.0000
Stddev	.0000	.0001	.0005	.0009	.0000	.00008	.0025	.0000
%RSD	69.93	111.5	4.108	49.62	11.86	200.75	271.7	28.95
#1	-.0001	.0000	.0127	.0012	.0002	-.00010	-.0027	.0000
#2	.0000	.0002	.0135	.0025	.0003	.00002	.0009	.0000
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0036	.0002	-.0003	.0002	-.0001	-.0008	.0042
Stddev	.0000	.0046	.0000	.0007	.0003	.0000	.0002	.0033
%RSD	39.71	126.7	13.88	235.9	156.4	19.02	32.20	78.14
#1	-.0001	.0068	.0002	-.0008	.0004	-.0002	-.0006	.0019
#2	-.0001	.0004	.0003	.0002	.0000	-.0001	-.0009	.0065
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020 *
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003	-.0002	-.0106	-.0001	-.0003	.0000	-.0007	F .0062
Stddev	.0013	.0000	.0198	.0000	.0019	.000	.0006	.0007
%RSD	404.5	4.201	186.7	53.02	583.4	145.5	94.92	11.34
#1	-.0006	-.0002	-.0247	-.0001	-.0017	.0000	-.0011	.0057
#2	.0012	-.0001	.0034	-.0001	.0010	.0000	-.0002	.0067
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	None	Chk Fail
High Limit								.0040
Low Limit								-.0040

*rerun
am
4/14/15

Sample Name: ICB Acquired: 4/14/2015 9:13:56 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0005	-.0064	.0036	-.0072	-.0001	-.0030	.00000
Stddev	.0005	.0014	.0198	.0041	.0015	.0004	.0040	.00009
%RSD	324.2	285.6	309.5	113.1	21.00	288.4	131.1	2003.6
#1	.0005	.0015	-.0204	.0007	-.0083	.0001	-.0002	.00007
#2	-.0002	-.0005	.0076	.0065	-.0062	-.0004	-.0058	-.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0008	.0004	.0002	.0001	-.0001	.0000	.0002	.0010
Stddev	.0006	.0005	.0001	.0005	.0001	.0001	.0022	.0009
%RSD	73.60	126.6	42.01	322.7	150.5	347.1	1242.	87.20
#1	-.0004	.0008	.0002	.0005	.0000	.0001	.0017	.0004
#2	-.0013	.0000	.0001	-.0002	-.0002	.0000	-.0014	.0016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2854.6	78122.	4403.6
Stddev	4.4	1297.	44.5
%RSD	.15259	1.6602	1.0100
#1	2851.6	77205.	4435.0
#2	2857.7	79039.	4372.1

Sample Name: ICB Acquired: 4/14/2015 9:16:28 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: RERUN

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	-.0010	.0026	-.0019	-.0001	-.00008	-.0003	.0000
Stddev	.0001	.0012	.0003	.0020	.0001	.00000	.0005	.000
%RSD	55.80	120.3	12.60	108.0	94.87	2.8857	207.8	1309.
#1	-.0001	-.0019	.0029	-.0004	.0000	-.00007	.0001	.0000
#2	-.0003	-.0002	.0024	-.0033	-.0001	-.00008	-.0006	.0000
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0111	.0003	-.0003	.0001	-.0001	-.0005	-.0015
Stddev	.0001	.0007	.0001	.0003	.0000	.0002	.0004	.0009
%RSD	134.3	6.086	28.19	94.62	1.555	265.8	90.15	60.42
#1	.0000	.0115	.0002	-.0006	.0001	.0001	-.0002	-.0008
#2	.0001	.0106	.0003	-.0001	.0001	-.0002	-.0008	-.0021
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0008	-.0227	-.0001	.0010	.0000	.0004	.0020
Stddev	.0007	.0005	.0128	.0000	.0003	.000	.0013	.0002
%RSD	431.4	66.51	56.56	37.95	30.17	33.39	363.2	8.247
#1	-.0007	.0004	-.0136	-.0001	.0013	.0000	.0013	.0018
#2	.0004	.0012	-.0317	.0000	.0008	.0000	-.0006	.0021
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass
High Limit								
Low Limit								

Sample Name: ICB Acquired: 4/14/2015 9:16:28 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: RERUN

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0007	-.0439	.0022	-.0005	.0000	-.0060	-.00001
Stddev	.0000	.0015	.0150	.0033	.0090	.000	.0071	.00001
%RSD	35.25	216.6	34.10	150.7	1853.	867.0	118.6	69.204
#1	.0002	.0004	-.0333	.0046	-.0069	-.0002	-.0110	-.00002
#2	.0001	-.0018	-.0544	-.0001	.0059	.0002	-.0010	-.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	.0003	.0001	.0005	.0002	.0000	-.0007	-.0013
Stddev	.0004	.0001	.0001	.0000	.0001	.0001	.0000	.0018
%RSD	158.5	24.41	47.64	4.957	75.16	226.4	.7207	139.6
#1	-.0005	.0003	.0002	.0005	.0001	.0001	-.0007	-.0026
#2	.0000	.0002	.0001	.0005	.0003	.0000	-.0007	.0000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2887.1	78232.	4433.8
Stddev	3.3	113.	14.9
%RSD	.11323	.14493	.33551
#1	2884.8	78312.	4423.3
#2	2889.4	78152.	4444.3

Sample Name: LLICV Acquired: 4/14/2015 9:19:59 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-69-J 0.5/50mL

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0108	.0095	.0225	.0082	.0041	.00113	.0215	.0011
Stddev	.0000	.0009	.0024	.0009	.0002	.00009	.0015	.0001
%RSD	.1187	9.748	10.79	11.24	5.979	7.5360	7.139	6.475
#1	.0108	.0088	.0242	.0088	.0039	.00107	.0204	.0011
#2	.0108	.0101	.0207	.0075	.0043	.00120	.0226	.0010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599 *
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0009	F .0267	.0223	.0039	.0024	.0039	.0039	F .0264
Stddev	.0000	.0111	.0003	.0005	.0002	.0000	.0007	.0007
%RSD	4.081	41.45	1.176	13.62	7.062	.9041	18.35	2.781
#1	.0009	.0345	.0224	.0036	.0025	.0040	.0034	.0269
#2	.0009	.0188	.0221	.0043	.0023	.0039	.0044	.0259
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value		.0200						.0200
Range		30.00%						30.00%

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0108	.0208	.0105	.0051	F .0073	.0010	.0013	.0048
Stddev	.0002	.0011	.0436	.0001	.0004	.0000	.0010	.0001
%RSD	1.685	5.471	415.9	2.763	5.859	3.056	72.17	2.122
#1	.0109	.0216	-.0204	.0052	.0070	.0010	.0020	.0047
#2	.0107	.0200	.0413	.0050	.0076	.0010	.0006	.0048
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Fail	Chk Pass	None	Chk Pass
Value					.0050			
Range					30.00%			

*rerun
CM
4/14/15

Sample Name: LLICV Acquired: 4/14/2015 9:19:59 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-69-J 0.5/50mL

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0042	.0402	.2370	.0200	.2071	.0040	.2131	.00105
Stddev	.0001	.0021	.0096	.0019	.0096	.0007	.0030	.00000
%RSD	3.319	5.142	4.060	9.745	4.629	16.59	1.424	.12066
#1	.0041	.0417	.2302	.0186	.2138	.0045	.2152	.00105
#2	.0043	.0387	.2438	.0214	.2003	.0035	.2109	.00105
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0104	.0209	.0022	.0044	.0041	.0043	.0232	.0442
Stddev	.0003	.0004	.0001	.0002	.0000	.0001	.0015	.0034
%RSD	2.689	1.707	5.882	3.579	.3480	1.880	6.634	7.796
#1	.0106	.0212	.0021	.0043	.0041	.0044	.0221	.0466
#2	.0102	.0207	.0023	.0046	.0041	.0042	.0243	.0418
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2901.9	79355.	4468.8
Stddev	9.4	526.	6.3
%RSD	.32272	.66250	.14096
#1	2908.5	78983.	4473.3
#2	2895.3	79727.	4464.4

Sample Name: LLICV Acquired: 4/14/2015 9:31:26 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-69-J 0.5/50mL RERUN

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0104	.0099	.0212	.0088	.0041	.00104	.0192	.0010
Stddev	.0003	.0001	.0001	.0029	.0001	.00006	.0005	.0000
%RSD	2.612	.8897	.6566	32.83	1.232	5.9182	2.417	1.031
#1	.0103	.0098	.0213	.0068	.0041	.00108	.0189	.0010
#2	.0106	.0100	.0211	.0109	.0041	.00099	.0195	.0010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0009	.0247	.0211	.0037	.0020	.0042	.0041	.0245
Stddev	.0001	.0055	.0000	.0003	.0005	.0003	.0006	.0006
%RSD	14.36	22.35	.2341	8.026	26.12	7.651	13.83	2.313
#1	.0009	.0208	.0210	.0035	.0017	.0044	.0037	.0249
#2	.0010	.0286	.0211	.0039	.0024	.0039	.0045	.0241
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0110	.0214	-.0245	.0051	F .0087	.0009	.0008	.0048
Stddev	.0010	.0018	.0215	.0001	.0006	.0000	.0001	.0001
%RSD	8.912	8.287	87.99	1.059	7.218	3.762	14.89	2.628
#1	.0117	.0202	-.0092	.0051	.0082	.0009	.0009	.0047
#2	.0103	.0227	-.0397	.0051	.0091	.0009	.0008	.0049
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Fail	Chk Pass	None	Chk Pass
Value					.0050			
Range					30.00%			

Sample Name: LLICV Acquired: 4/14/2015 9:31:26 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-69-J 0.5/50mL RERUN

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0042	.0399	.2186	.0213	.1994	.0041	.1946	.00097
Stddev	.0000	.0003	.0697	.0007	.0018	.0008	.0026	.00002
%RSD	.9859	.8154	31.88	3.164	.9167	19.23	1.338	2.3404
#1	.0042	.0401	.2679	.0208	.1981	.0047	.1928	.00096
#2	.0043	.0397	.1693	.0217	.2007	.0036	.1965	.00099
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0102	.0209	.0023	.0036	.0042	.0042	.0221	.0402
Stddev	.0008	.0002	.0000	.0001	.0001	.0000	.0025	.0010
%RSD	7.541	.7718	1.576	2.460	3.161	.7375	11.46	2.522
#1	.0097	.0208	.0022	.0036	.0041	.0042	.0239	.0395
#2	.0108	.0210	.0023	.0037	.0043	.0041	.0203	.0409
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2876.6	78650.	4524.8
Stddev	3.7	16.	69.5
%RSD	.12993	.02086	1.5356
#1	2874.0	78662.	4574.0
#2	2879.2	78639.	4475.7

Sample Name: LLICV,0.5 Acquired: 4/14/2015 9:33:52 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-69-J 1/50mL

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0203	.0211	.0403	.0219	.0083	.00208	.0398	.0020
Stddev	.0002	.0002	.0030	.0006	.0002	.00003	.0003	.0001
%RSD	1.126	1.089	7.518	2.603	2.066	1.5126	.6813	2.684
#1	.0201	.0209	.0425	.0224	.0084	.00206	.0400	.0019
#2	.0205	.0213	.0382	.0215	.0082	.00210	.0396	.0020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0021	.0499	.0411	.0084	.0045	.0081	.0079	.0442
Stddev	.0000	.0014	.0003	.0005	.0002	.0002	.0006	.0038
%RSD	.0807	2.880	.7479	5.612	4.201	2.839	8.165	8.616
#1	.0021	.0488	.0413	.0087	.0047	.0083	.0083	.0415
#2	.0021	.0509	.0409	.0080	.0044	.0080	.0074	.0469
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0216	.0440	.0205	.0103	.0126	.0019	.0009	.0083
Stddev	.0002	.0031	.0256	.0000	.0006	.0001	.0001	.0002
%RSD	1.069	6.966	124.7	.0762	4.647	5.174	7.797	2.641
#1	.0214	.0418	.0386	.0103	.0122	.0020	.0010	.0085
#2	.0217	.0462	.0024	.0103	.0130	.0018	.0009	.0082
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass
Value								
Range								

NR
GM
4/14/15

Sample Name: LLICV,0.5 Acquired: 4/14/2015 9:33:52 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-69-J 1/50mL

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0083	.0812	.4278	.0393	.4022	.0082	.4210	.00206
Stddev	.0003	.0004	.0079	.0018	.0016	.0000	.0030	.00006
%RSD	3.448	.4701	1.852	4.457	.3898	.6103	.7052	2.7759
#1	.0081	.0815	.4334	.0406	.4033	.0082	.4231	.00210
#2	.0085	.0809	.4222	.0381	.4011	.0081	.4189	.00202
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0190	.0419	.0041	.0082	.0082	.0082	.0431	.0825
Stddev	.0014	.0000	.0003	.0000	.0002	.0001	.0020	.0012
%RSD	7.376	.0459	7.636	.4591	1.977	1.660	4.714	1.513
#1	.0180	.0418	.0039	.0082	.0081	.0081	.0417	.0816
#2	.0200	.0419	.0043	.0081	.0083	.0083	.0445	.0834
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2886.4	79022.	4493.5
Stddev	2.7	131.	29.0
%RSD	.09406	.16530	.64460
#1	2888.3	79115.	4514.0
#2	2884.5	78930.	4473.0

NR
GWM
4/14/15

Sample Name: CCVB1 Acquired: 4/14/2015 9:37:22 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.650	10.14	-.0007	1.002	10.07	-.00004	-.0001	.0001
Stddev	.042	.09	.0036	.006	.10	.00002	.0002	.0001
%RSD	.5476	.9272	485.4	.6329	.9465	60.745	235.0	104.3
#1	7.667	10.02	-.0004	1.003	10.06	-.00007	.0001	.0000
#2	7.592	10.25	-.0026	1.008	10.21	-.00003	.0001	.0000
#3	7.690	10.15	.0041	.9931	10.01	-.00004	-.0002	.0001
#4	7.651	10.13	-.0041	1.002	9.993	-.00002	-.0003	.0001
Check ?	None	Chk Pass	None	Chk Pass	Chk Pass	None	None	None
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	9.954	9.775	-.0001	.0002	-.0002	-.0008	10.05
Stddev	.0001	.074	.167	.0003	.0002	.0002	.0004	.05
%RSD	115.3	.7390	1.706	251.1	107.6	123.2	55.81	.5415
#1	-.0001	9.881	9.526	-.0005	.0002	.0001	-.0010	9.975
#2	.0000	10.00	9.875	-.0002	.0003	-.0002	-.0009	10.04
#3	.0000	9.902	9.843	.0000	.0003	-.0004	-.0001	10.06
#4	-.0003	10.03	9.857	.0002	-.0001	-.0002	-.0011	10.10
Check ?	None	Chk Pass	None	None	None	None	None	Chk Pass
Value								
Range								

Sample Name: CCVB1 Acquired: 4/14/2015 9:37:22 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0010	1.015	10.11	9.678	10.13	.9994	1.004	.0002
Stddev	.0011	.006	.03	.034	.02	.0040	.004	.0000
%RSD	103.5	.5850	.2733	.3465	.2155	.4000	.4230	14.14
#1	.0002	1.023	10.07	9.644	10.13	.9964	1.007	.0002
#2	.0001	1.017	10.11	9.719	10.14	1.003	1.007	.0002
#3	.0015	1.010	10.12	9.659	10.10	.9956	.9986	.0002
#4	.0023	1.011	10.13	9.691	10.15	1.003	1.002	.0002
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None
Value								
Range								

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006	10.02	10.17	-.0007	10.10	-.0004	10.12	.98843
Stddev	.0003	.02	.03	.0017	.04	.0002	.02	.00619
%RSD	44.95	.1879	.3070	244.6	.3849	56.62	.1646	.62602
#1	.0005	10.04	10.18	-.0010	10.09	-.0002	10.13	.98107
#2	.0006	9.997	10.17	.0003	10.16	-.0007	10.13	.98981
#3	.0009	10.01	10.12	.0009	10.07	-.0004	10.10	.98690
#4	.0003	10.03	10.20	-.0029	10.07	-.0003	10.11	.99594
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	Chk Pass
Value								
Range								

Sample Name: CCVB1 Acquired: 4/14/2015 9:37:22 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0009	.0008	.0006	.0008	.0001	.0001	1.018	1.001
Stddev	.0006	.0011	.0002	.0005	.0002	.0000	.005	.009
%RSD	66.57	133.1	36.97	72.26	142.8	22.97	.5201	.8751
#1	-.0016	.0013	.0004	.0003	-.0001	.0002	1.025	1.006
#2	-.0012	.0010	.0008	.0006	.0001	.0002	1.015	1.009
#3	-.0007	-.0008	.0004	.0016	.0003	.0001	1.013	.9896
#4	-.0002	.0018	.0006	.0006	.0002	.0001	1.019	.9991
Check ?	None	None	None	None	None	None	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2835.8	77030.	4465.0
Stddev	18.1	215.	25.4
%RSD	.63712	.27928	.56942
#1	2835.3	77004.	4493.7
#2	2860.3	77337.	4479.2
#3	2817.1	76937.	4442.7
#4	2830.3	76843.	4444.6

Sample Name: CCVA1 Acquired: 4/14/2015 9:42:38 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2516	.2688	.2521	.2561	.2534	.25034	.2500	.2522
Stddev	.0005	.0015	.0009	.0024	.0014	.00067	.0012	.0008
%RSD	.1962	.5681	.3441	.9191	.5469	.26580	.4617	.3008
#1	.2517	.2698	.2529	.2581	.2543	.24947	.2490	.2530
#2	.2519	.2680	.2527	.2574	.2546	.25089	.2513	.2520
#3	.2509	.2671	.2517	.2560	.2516	.25017	.2490	.2526
#4	.2520	.2704	.2510	.2528	.2531	.25084	.2505	.2512
Check ?	Chk Pass	None	Chk Pass	None	None	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2508	.5018	.4995	.2532	.2508	.2502	.2488	.2560
Stddev	.0011	.0055	.0027	.0024	.0015	.0006	.0014	.0064
%RSD	.4379	1.101	.5404	.9488	.6130	.2426	.5509	2.517
#1	.2523	.4966	.5009	.2498	.2526	.2510	.2486	.2589
#2	.2506	.5012	.5023	.2554	.2504	.2500	.2474	.2638
#3	.2507	.5000	.4960	.2539	.2515	.2504	.2485	.2505
#4	.2497	.5096	.4990	.2537	.2490	.2496	.2507	.2510
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
Value								
Range								

Sample Name: CCVA1 Acquired: 4/14/2015 9:42:38 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2506	-.0010	.2729	.2520	.2600	.2538	.2499	.2502
Stddev	.0010	.0009	.0146	.0009	.0007	.0020	.0017	.0007
%RSD	.3938	95.80	5.333	.3478	.2673	.7918	.6634	.2640
#1	.2520	-.0006	.2663	.2522	.2600	.2510	.2486	.2508
#2	.2506	-.0024	.2935	.2530	.2598	.2554	.2499	.2499
#3	.2500	-.0004	.2600	.2509	.2592	.2552	.2522	.2506
#4	.2499	-.0006	.2717	.2517	.2609	.2536	.2488	.2494
Check ?	Chk Pass	None	None	Chk Pass	None	Chk Pass	None	Chk Pass
Value								
Range								

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2515	.0001	2.631	.2482	.1138	.2507	.2526	.00005
Stddev	.0009	.0011	.011	.0032	.0032	.0004	.0116	.00005
%RSD	.3638	2194.	.4347	1.297	2.802	.1745	4.586	114.05
#1	.2518	.0002	2.645	.2470	.1123	.2510	.2453	.00008
#2	.2510	.0009	2.634	.2511	.1170	.2504	.2690	-.00002
#3	.2527	-.0015	2.626	.2505	.1101	.2503	.2436	.00003
#4	.2507	.0006	2.619	.2442	.1158	.2511	.2525	.00009
Check ?	Chk Pass	None	None	Chk Pass	None	Chk Pass	None	None
Value								
Range								

Sample Name: CCVA1 Acquired: 4/14/2015 9:42:38 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2502	.2499	.2528	.2534	.2505	.2513	.0020	-.0009
Stddev	.0015	.0017	.0015	.0016	.0010	.0009	.0012	.0014
%RSD	.5907	.6778	.5967	.6482	.4076	.3519	62.62	148.7
#1	.2523	.2509	.2508	.2510	.2520	.2509	.0009	-.0008
#2	.2502	.2495	.2533	.2548	.2501	.2519	.0022	-.0003
#3	.2488	.2515	.2544	.2540	.2502	.2522	.0037	-.0029
#4	.2496	.2477	.2527	.2536	.2497	.2503	.0012	.0003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2877.1	78269.	4473.5
Stddev	10.1	517.	27.4
%RSD	.35178	.66027	.61222
#1	2864.4	78880.	4476.7
#2	2889.1	77852.	4435.2
#3	2876.7	77828.	4481.9
#4	2878.2	78515.	4500.0

Sample Name: CCB Acquired: 4/14/2015 9:49:53 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	-.0026	-.0004	-.0018	.0001	-.00003	-.0011	-.0001
Stddev	.0000	.0005	.0007	.0010	.0001	.00005	.0005	.0000
%RSD	11.70	19.14	197.7	55.28	62.46	210.47	44.18	55.26
#1	-.0001	-.0022	-.0009	-.0011	.0001	-.00006	-.0015	.0000
#2	-.0002	-.0029	.0001	-.0025	.0002	.00001	-.0008	-.0001
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0009	.0002	-.0002	.0002	.0005	-.0004	.0040
Stddev	.0001	.0122	.0000	.0004	.0001	.0000	.0002	.0023
%RSD	80.61	1314.	13.29	180.1	32.16	.0380	44.50	58.27
#1	-.0001	.0096	.0002	.0001	.0002	.0005	-.0003	.0057
#2	-.0002	-.0077	.0002	-.0005	.0002	.0005	-.0005	.0024
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0007	.0000	-.0139	-.0001	.0020	.0000	.0007	.0008
Stddev	.0021	.0012	.0399	.0000	.0023	.0000	.0009	.0000
%RSD	290.4	3978.	288.1	2.531	114.7	39.34	131.0	5.888
#1	-.0008	-.0008	-.0421	-.0001	.0004	.0000	.0000	.0008
#2	.0022	.0009	.0144	-.0001	.0036	.0000	.0013	.0008
Check ?	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None	Chk Pass
High Limit								
Low Limit								

Sample Name: CCB Acquired: 4/14/2015 9:49:53 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0012	.0826	.0028	-.0130	.0001	-.0053	.00004
Stddev	.0003	.0022	.0006	.0002	.0033	.0010	.0080	.00001
%RSD	337.4	193.6	.6817	5.374	25.28	1286.	150.4	27.403
#1	.0003	.0004	.0830	.0027	-.0153	.0008	.0003	.00003
#2	-.0001	-.0028	.0822	.0029	-.0107	-.0006	-.0109	.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	.0009	.0000	.0002	.0000	.0000	.0002	-.0035
Stddev	.0005	.0002	.0001	.0001	.000	.000	.0016	.0021
%RSD	176.7	17.31	242.9	70.64	2719.	212.5	744.4	59.84
#1	-.0007	.0010	.0000	.0003	.0000	.0000	.0013	-.0020
#2	.0001	.0008	.0001	.0001	-.0001	.0000	-.0009	-.0050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2862.7	79478.	4586.2
Stddev	5.1	415.	10.9
%RSD	.17688	.52167	.23808
#1	2859.1	79771.	4578.5
#2	2866.3	79185.	4593.9

Sample Name: ICSA Acquired: 4/14/2015 9:52:19 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-77-D

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	23.04	425.5	.0068	.0031	.0001	-.00044	.0065	.0014
Stddev	.01	6.2	.0017	.0004	.0004	.00010	.0023	.0002
%RSD	.0273	1.453	25.07	12.48	320.3	22.404	34.56	12.60
#1	23.05	429.9	.0081	.0028	.0004	-.00051	.0049	.0012
#2	23.04	421.1	.0056	.0033	-.0002	-.00037	.0081	.0015
Check ?	None	None	None	None	None	None	None	None
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	471.0	*****	.0014	.0003	-.0008	-.0017	186.9
Stddev	.000	.3	-----	.0002	.0004	.0007	.0005	.7
%RSD	900.2	.0694	-----	11.83	142.6	85.11	28.18	.3526
#1	-.0002	470.8	-----	.0015	.0000	-.0014	-.0014	186.4
#2	.0001	471.2	-----	.0013	.0006	-.0003	-.0021	187.3
Check ?	None	Chk Pass	None	None	None	None	None	Chk Pass
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0091	.0042	510.6	*****	401.7	-.0015	-.0060	.0001
Stddev	.0034	.0010	1.5	-----	.6	.0001	.0008	.0000
%RSD	37.59	23.38	.2933	-----	.1396	7.389	13.39	33.23
#1	-.0067	.0035	509.5	-----	401.3	-.0014	-.0054	.0000
#2	-.0115	.0049	511.6	-----	402.1	-.0016	-.0065	.0001
Check ?	None	None	Chk Pass	None	None	None	None	None
Value								
Range								

Sample Name: ICSA Acquired: 4/14/2015 9:52:19 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-77-D

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0039	.0021	-.0300	.0038	.0012	-.0001	.0010	.00326
Stddev	.0006	.0004	.0112	.0007	.0060	.0003	.0058	.00017
%RSD	15.21	21.35	37.35	19.30	499.0	277.7	565.8	5.3652
#1	.0035	.0024	-.0221	.0044	.0054	-.0004	-.0031	.00338
#2	.0043	.0017	-.0379	.0033	-.0030	.0001	.0051	.00313
Check ?	None	None	None	None	None	None	None	None
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0021	.0017	.0008	.0016	-.0023	-.0006	.0173	-.0236
Stddev	.0007	.0008	.0002	.0002	.0003	.0001	.0010	.0009
%RSD	33.84	48.59	19.97	14.44	14.88	12.62	5.640	3.646
#1	-.0026	.0023	.0009	.0014	-.0021	-.0006	.0166	-.0242
#2	-.0016	.0011	.0007	.0018	-.0026	-.0007	.0180	-.0230
Check ?	None	None	None	None	None	None	None	None
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2545.7	68081.	4329.6
Stddev	3.5	1103.	13.7
%RSD	.13647	1.6195	.31580
#1	2548.1	68860.	4319.9
#2	2543.2	67301.	4339.2

Sample Name: ICSAB Acquired: 4/14/2015 9:54:56 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-75-B

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	23.02	424.6	.8758	-.0015	.4990	.46658	.0074	.8904
Stddev	.13	2.9	.0060	.0033	.0008	.00155	.0023	.0000
%RSD	.5768	.6805	.6827	213.7	.1630	.33294	30.37	.0002
#1	22.93	422.6	.8800	.0008	.4996	.46548	.0090	.8904
#2	23.12	426.7	.8715	-.0039	.4985	.46767	.0058	.8903
Check ?	None	None	Chk Pass	None	Chk Pass	Chk Pass	None	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.8788	472.4	*****	.4871	.4385	.4378	.4399	187.4
Stddev	.0005	2.0	-----	.0006	.0001	.0015	.0024	.3
%RSD	.0593	.4289	-----	.1314	.0200	.3513	.5485	.1523
#1	.8791	471.0	-----	.4866	.4385	.4388	.4382	187.2
#2	.8784	473.9	-----	.4875	.4386	.4367	.4416	187.6
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.8410	.0034	510.0	*****	396.3	.4752	.5222	.0001
Stddev	.0024	.0001	1.1	-----	4.5	.0001	.0059	.0002
%RSD	.2813	4.011	.2115	-----	1.134	.0300	1.126	165.7
#1	.8393	.0035	510.8	-----	399.5	.4751	.5264	.0000
#2	.8427	.0033	509.2	-----	393.1	.4753	.5181	.0003
Check ?	Chk Pass	None	Chk Pass	None	None	Chk Pass	Chk Pass	None
Value								
Range								

Sample Name: ICSAB Acquired: 4/14/2015 9:54:56 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: ICP14-75-B

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.8652	.0021	-.0211	.0011	-.0050	.8946	.0043	.00331
Stddev	.0013	.0060	.0511	.0008	.0153	.0065	.0011	.00005
%RSD	.1475	289.9	242.3	72.12	304.2	.7296	24.73	1.6321
#1	.8661	-.0022	.0150	.0017	.0058	.8900	.0036	.00335
#2	.8643	.0063	-.0572	.0006	-.0158	.8992	.0051	.00327
Check ?	Chk Pass	None	None	None	None	Chk Pass	None	None
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0015	.0025	.0006	.5095	.8700	.8487	.0199	-.0233
Stddev	.0014	.0013	.0001	.0002	.0015	.0035	.0001	.0026
%RSD	97.16	50.69	10.10	.0480	.1721	.4090	.3710	11.19
#1	.0025	.0035	.0006	.5097	.8690	.8512	.0199	-.0215
#2	.0005	.0016	.0005	.5093	.8711	.8462	.0198	-.0252
Check ?	None	None	None	Chk Pass	Chk Pass	Chk Pass	None	None
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2545.0	67989.	4343.1
Stddev	5.9	312.	18.1
%RSD	.23003	.45927	.41710
#1	2549.2	67768.	4355.9
#2	2540.9	68209.	4330.3

Sample Name: 200ppm Fe Acquired: 4/14/2015 9:57:48 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: 0.2/10mL Fe 10,000ppm MET2-40-J

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	.0081	.0029	-.0036	.0003	-.00015	-.0013	.0009
Stddev	.0001	.0002	.0002	.0020	.0000	.00005	.0014	.0000
%RSD	50e6	2.086	7.233	55.91	5.186	33.317	104.3	3.425
#1	.0001	.0080	.0028	-.0050	.0003	-.00019	-.0003	.0010
#2	-.0001	.0083	.0031	-.0021	.0003	-.00012	-.0023	.0009
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	.0160	.0097	-.0001	.0011	.0000	-.0009	F 199.9
Stddev	.0001	.0004	.0006	.0002	.0002	.0000	.0006	1.1
%RSD	1660000.	2.618	5.977	265.4	15.43	302.8	64.00	.5546
#1	-.0001	.0157	.0101	.0001	.0012	.0000	-.0014	200.7
#2	.0001	.0163	.0092	-.0002	.0010	.0000	-.0005	199.1
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit								.0200
Low Limit								-.0200

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0023	-.0021	.0019	F .0076	.0077	-.0003	-.0028	-.0011
Stddev	.0017	.0000	.0158	.0005	.0037	.0001	.0003	.0004
%RSD	74.75	2.080	818.5	6.714	48.43	22.15	12.18	34.56
#1	-.0035	-.0021	.0131	.0079	.0103	-.0002	-.0030	-.0009
#2	-.0011	-.0022	-.0093	.0072	.0050	-.0003	-.0025	-.0014
Check ?	Chk Pass	Chk Pass	None	Chk Fail	None	Chk Pass	None	Chk Pass
High Limit				.0050				
Low Limit				-.0050				

Sample Name: 200ppm Fe Acquired: 4/14/2015 9:57:48 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: 0.2/10mL Fe 10,000ppm MET2-40-J

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0015	.0023	-.0401	-.0042	-.0115	-.0008	-.0088	.00012
Stddev	.0001	.0015	.0061	.0015	.0070	.0000	.0080	.00001
%RSD	3.409	63.90	15.12	34.65	61.07	2.010	91.49	8.5391
#1	.0015	.0034	-.0358	-.0052	-.0165	-.0008	-.0031	.00012
#2	.0016	.0013	-.0444	-.0032	-.0065	-.0008	-.0145	.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0024	.0000	-.0006	.0004	.0002	.0144	.0001
Stddev	.0002	.0002	.0001	.0003	.0002	.0001	.0031	.0001
%RSD	81.83	8.663	1914.	56.62	43.78	87.81	21.69	121.1
#1	-.0001	.0026	-.0001	-.0003	.0003	.0001	.0166	.0001
#2	-.0004	.0023	.0001	-.0008	.0006	.0003	.0122	.0000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2866.7	77796.	4452.5
Stddev	1.3	155.	42.5
%RSD	.04666	.19933	.95525
#1	2867.6	77906.	4422.4
#2	2865.7	77686.	4482.6

Sample Name: CCVB Acquired: 4/14/2015 10:00:23 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.611	10.34	-.0006	1.027	9.892	-.00004	.0001	.0000
Stddev	.020	.03	.0016	.001	.158	.00003	.0005	.0001
%RSD	.2579	.2560	254.5	.0482	1.600	65.037	415.5	555.6
#1	7.597	10.32	.0005	1.027	9.780	-.00002	.0004	.0001
#2	7.624	10.36	-.0018	1.026	10.00	-.00006	-.0002	.0000
Check ?	None	Chk Pass	None	Chk Pass	Chk Pass	None	None	None
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	10.02	9.585	-.0001	.0002	.0000	-.0009	10.09
Stddev	.000	.06	.063	.0003	.0002	.0001	.0001	.03
%RSD	28.62	.6191	.6613	251.5	123.3	1633.	15.67	.3334
#1	.0000	9.972	9.541	-.0004	.0003	-.0001	-.0010	10.06
#2	-.0001	10.06	9.630	.0001	.0000	.0001	-.0008	10.11
Check ?	None	Chk Pass	None	None	None	None	None	Chk Pass
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0017	1.036	10.10	9.485	10.35	1.004	1.015	-.0002
Stddev	.0011	.027	.03	.154	.20	.001	.016	.0001
%RSD	65.36	2.580	.2718	1.628	1.929	.0548	1.547	30.94
#1	.0025	1.055	10.12	9.376	10.49	1.004	1.026	-.0003
#2	.0009	1.017	10.08	9.594	10.21	1.003	1.004	-.0002
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None
Value								
Range								

Sample Name: CCVB Acquired: 4/14/2015 10:00:23 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003	9.986	10.20	.0007	10.34	-.0006	10.30	.98947
Stddev	.0000	.011	.18	.0000	.15	.0004	.27	.00116
%RSD	14.75	.1111	1.813	5.080	1.476	67.47	2.571	.11721
#1	.0003	9.978	10.33	.0007	10.45	-.0009	10.49	.98865
#2	.0003	9.994	10.07	.0007	10.23	-.0003	10.12	.99029
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	Chk Pass
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0005	-.0004	.0004	.0013	.0001	.0001	1.007	1.018
Stddev	.0004	.0003	.0001	.0007	.0001	.0000	.001	.007
%RSD	80.41	65.86	26.67	56.85	106.9	7.987	.0701	.6937
#1	.0002	-.0006	.0005	.0008	.0002	.0001	1.008	1.013
#2	.0008	-.0002	.0004	.0018	.0000	.0001	1.007	1.023
Check ?	None	None	None	None	None	None	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2895.5	77863.	4580.1
Stddev	3.5	177.	96.5
%RSD	.12254	.22752	2.1062
#1	2898.0	77988.	4648.3
#2	2893.0	77737.	4511.9

Sample Name: CCVA Acquired: 4/14/2015 10:03:12 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2509	.2745	.2558	.2601	.2569	.25710	.2572	.2524
Stddev	.0006	.0032	.0024	.0021	.0032	.00086	.0013	.0003
%RSD	.2233	1.172	.9412	.8077	1.234	.33464	.4939	.1002
#1	.2505	.2723	.2575	.2616	.2546	.25649	.2581	.2523
#2	.2513	.2768	.2541	.2586	.2591	.25771	.2563	.2526
Check ?	Chk Pass	None	Chk Pass	None	None	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2516	.5060	.5082	.2547	.2510	.2483	.2520	.2779
Stddev	.0001	.0032	.0088	.0021	.0000	.0001	.0001	.0127
%RSD	.0207	.6297	1.729	.8246	.0155	.0397	.0479	4.566
#1	.2516	.5083	.5020	.2562	.2510	.2484	.2521	.2690
#2	.2517	.5038	.5145	.2532	.2510	.2483	.2519	.2869
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2528	.0022	.2832	.2583	.2729	.2558	.2543	.2491
Stddev	.0009	.0011	.0142	.0069	.0087	.0003	.0005	.0001
%RSD	.3384	49.52	5.005	2.674	3.196	.1156	.2160	.0410
#1	.2522	.0030	.2933	.2534	.2667	.2556	.2539	.2491
#2	.2534	.0014	.2732	.2632	.2790	.2561	.2546	.2490
Check ?	Chk Pass	None	None	Chk Pass	None	Chk Pass	None	Chk Pass
Value								
Range								

Sample Name: CCVA Acquired: 4/14/2015 10:03:12 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2512	-.0027	2.608	.2546	.1184	.2562	.2637	.00023
Stddev	.0007	.0015	.004	.0016	.0102	.0022	.0072	.00029
%RSD	.2963	54.19	.1499	.6150	8.614	.8476	2.729	123.73
#1	.2507	-.0038	2.611	.2557	.1112	.2547	.2586	.00003
#2	.2517	-.0017	2.605	.2535	.1256	.2578	.2688	.00044
Check ?	Chk Pass	None	None	Chk Pass	None	Chk Pass	None	None
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2512	.2504	.2531	.2540	.2510	.2553	.0008	-.0013
Stddev	.0006	.0012	.0006	.0004	.0007	.0000	.0003	.0039
%RSD	.2425	.4736	.2513	.1677	.2623	.0010	41.28	309.7
#1	.2508	.2495	.2535	.2537	.2506	.2553	.0011	-.0041
#2	.2517	.2512	.2526	.2543	.2515	.2553	.0006	.0015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2928.5	79587.	4525.5
Stddev	1.6	43.	7.3
%RSD	.05556	.05405	.16095
#1	2927.3	79556.	4520.3
#2	2929.6	79617.	4530.6

Sample Name: CCB Acquired: 4/14/2015 10:05:25 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	-.0009	.0003	.0008	.0001	.00002	-.0020	.0000
Stddev	.0002	.0018	.0017	.0006	.0001	.00007	.0002	.000
%RSD	138.8	195.8	620.1	77.89	52.21	408.14	8.898	269.4
#1	.0000	.0004	-.0009	.0013	.0001	-.00003	-.0019	.0000
#2	-.0003	-.0022	.0015	.0004	.0002	.00007	-.0021	.0000
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	-.0014	.0004	-.0001	.0001	.0000	-.0003	.0028
Stddev	.000	.0117	.0000	.0004	.0001	.000	.0000	.0033
%RSD	59.76	808.5	10.90	593.7	110.1	1425.	12.99	115.5
#1	.0000	.0068	.0004	-.0003	.0000	.0003	-.0004	.0005
#2	.0000	-.0097	.0004	.0002	.0002	-.0003	-.0003	.0051
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	-.0002	-.0087	.0000	.0027	.0000	.0000	.0007
Stddev	.001	.0014	.0097	.0000	.0028	.000	.0012	.0002
%RSD	2757.	571.1	111.2	541.2	104.2	179.8	7312.	25.58
#1	.0005	-.0012	-.0019	.0000	.0047	-.0001	.0009	.0009
#2	-.0005	.0007	-.0155	.0000	.0007	.0000	-.0008	.0006
Check ?	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None	Chk Pass
High Limit								
Low Limit								

Sample Name: CCB Acquired: 4/14/2015 10:05:25 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0008	.0319	.0006	-.0031	-.0003	-.0132	.00006
Stddev	.0002	.0007	.0070	.0017	.0083	.0003	.0054	.00000
%RSD	128.2	86.41	21.97	273.6	270.6	84.57	40.61	4.3987
#1	-.0003	.0003	.0368	-.0006	.0028	-.0001	-.0094	.00006
#2	.0000	.0014	.0269	.0018	-.0090	-.0005	-.0170	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	.0000	.0002	.0003	-.0002	.0000	.0004	-.0011
Stddev	.0003	.0001	.0002	.0000	.0003	.0001	.0003	.0019
%RSD	48.98	1047.	146.0	5.817	206.4	1329.	80.32	174.2
#1	-.0007	.0001	.0000	.0003	.0001	.0001	.0002	.0003
#2	-.0004	-.0001	.0003	.0003	-.0004	-.0001	.0006	-.0024
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2886.8	78322.	4465.3
Stddev	26.7	566.	40.0
%RSD	.92365	.72254	.89498
#1	2868.0	77922.	4437.0
#2	2905.7	78722.	4493.5

Sample Name: KQ1503409-02 Acquired: 4/14/2015 10:23:51 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 2 Test Type: Sample Type:
Comment: EM 041415A 1/2 K1503521-MB

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F .0119	-.0008	F .0362	-.0002	-.00009	-.0012	-.0001	-.0001
#1	.0210	-.0013	.0377	-.0003	-.00003	-.0014	-.0001	-.0001
#2	.0028	-.0003	.0347	-.0001	-.00015	-.0010	-.0001	-.0001

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0051	-.0005	-.0001	-.0002	-.0009	.0052	.0010	-.0015
#1	.0051	-.0006	-.0004	.0000	-.0006	.0071	.0014	-.0007
#2	.0050	-.0004	.0001	-.0004	-.0012	.0033	.0007	-.0024

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0009	.0001	.0003	.0000	.0142	.0584	.0007	-.0031
#1	.0010	.0001	.0003	.0002	.0132	.0309	-.0003	-.0020
#2	.0009	.0000	.0004	-.0001	.0152	.0860	.0017	-.0041

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	-.0030	-.00002	-.0011	.0174	-.0001	.0000	.0010
#1	-.0009	-.0008	.00007	-.0002	.0181	-.0001	-.0001	.0009
#2	-.0002	-.0051	-.00010	-.0021	.0168	-.0002	.0002	.0010

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0012	.0011	.0047
#1	.0011	.0000	.0054
#2	.0012	.0021	.0040

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2873.0	80724.	4573.5
#1	2876.5	81230.	4584.5
#2	2869.6	80219.	4562.6

NR-see rerun
CW
4/14/15

Sample Name: KQ1503409-01 Acquired: 4/14/2015 10:26:16 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 2 Test Type: Sample Type:
Comment: EM 041415A 1/2 K1503521-LCSS

Elem	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	38.41	.3473	.5869	1.633	.37867	.7287	.8916	.8935
#1	38.43	.3454	.5848	1.633	.37930	.7259	.8917	.8926
#2	38.38	.3491	.5890	1.632	.37804	.7315	.8915	.8943

Elem	Ca3158	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	33.90	.7214	.6494	.4913	.5255	60.14	.5804	.0388
#1	33.94	.7231	.6494	.4908	.5246	60.06	.5798	.0370
#2	33.86	.7196	.6493	.4917	.5265	60.22	.5809	.0406

Elem	Mg2852	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	15.77	1.647	.6804	.7529	2.600	14.85	.7530	7.352
#1	15.78	1.651	.6809	.7531	2.598	14.83	.7576	7.367
#2	15.75	1.643	.6798	.7527	2.602	14.88	.7484	7.338

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2086	15.28	.49627	.8934	.5423	1.424	.5126	.7855
#1	.2088	15.27	.49668	.8955	.5421	1.426	.5131	.7864
#2	.2084	15.29	.49585	.8914	.5425	1.422	.5120	.7846

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.8016	.0034	1.277
#1	.8018	.0014	1.273
#2	.8015	.0054	1.281

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2944.8	80098.	4732.7
#1	2947.0	79794.	4736.5
#2	2942.7	80403.	4728.8

Sample Name: KQ1503409-02 Acquired: 4/14/2015 10:31:25 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 2 Test Type: Sample Type:
Comment: EM 041415A 1/2 K1503521-MB RERUN

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0022	.0007	F .0370	-.0002	-.00011	-.0008	-.0001	-.0003
#1	.0021	-.0004	.0369	-.0001	-.00012	-.0008	-.0001	-.0002
#2	.0023	.0018	.0370	-.0003	-.00009	-.0008	-.0001	-.0003

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0055	.0002	.0002	-.0004	-.0014	.0040	-.0002	-.0004
#1	.0056	.0001	.0004	-.0005	-.0016	.0035	-.0003	-.0006
#2	.0055	.0003	.0000	-.0002	-.0011	.0045	.0000	-.0002

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0009	.0002	.0007	.0001	.0137	.0657	.0048	.0033
#1	.0009	.0005	.0006	.0003	.0131	.0297	.0056	.0051
#2	.0008	.0000	.0008	.0000	.0144	.1016	.0041	.0015

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	-.0150	.00002	-.0018	.0158	.0001	.0003	.0010
#1	-.0003	-.0133	.00006	.0002	.0162	.0002	.0005	.0009
#2	-.0007	-.0167	-.00002	-.0038	.0155	.0000	.0001	.0011

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0011	.0031	.0057
#1	.0012	.0025	.0066
#2	.0011	.0037	.0049

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2884.9	79648.	4507.4
#1	2882.3	79530.	4504.8
#2	2887.5	79766.	4510.0

Sample Name: K1503521-001 Acquired: 4/14/2015 10:33:52 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 2 Test Type: Sample Type:
Comment: EM 041415A 1/2

Elem	Al3944	Sb2068	As1890 *	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.557	5.609	>90.00	.0210	-.00039	.0009	-.0201	-.0002
#1	5.559	5.622	732.5	.0212	-.00040	.0016	-.0201	-.0001
#2	5.554	5.596	735.7	.0208	-.00038	.0002	-.0202	-.0002

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0215	.0048	.0012	.0087	.0083	10.85	.0077	.0024
#1	.0219	.0050	.0014	.0087	.0081	10.93	.0082	.0030
#2	.0210	.0045	.0010	.0087	.0084	10.76	.0071	.0017

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0533	.0291	.0005	.0007	.1256	.2506	-.2036	1.368
#1	.0537	.0291	.0004	.0008	.1239	.2394	-.2056	1.363
#2	.0529	.0291	.0007	.0007	.1272	.2617	-.2015	1.373

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0067	.00062	-.0016	.0097	.1257	.0122	.0716
#1	.0003	-.0041	.00065	-.0014	.0097	.1248	.0117	.0716
#2	-.0005	.0174	.00059	-.0017	.0097	.1266	.0127	.0716

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0731	.0018	2.627
#1	.0731	.0013	2.633
#2	.0731	.0023	2.621

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2907.3	79558.	4551.2
#1	2912.0	79214.	4508.5
#2	2902.6	79902.	4594.0

*1/500 dilution
GM
4/14/15

Sample Name: K1503521-001L Acquired: 4/14/2015 10:36:10 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 10 Test Type: Sample Type:
Comment: EM 041415A 1/10

Elem	Al1670	Sb2068	As1890 *	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.010	1.160	>90.00	.0040	-.00012	-.0010	-.0033	-.0001
#1	1.011	1.162	549.9	.0038	-.00018	-.0018	-.0033	-.0002
#2	1.009	1.158	547.8	.0042	-.00006	-.0002	-.0033	-.0001

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0069	.0006	.0004	.0018	.0012	2.184	.0025	.0017
#1	.0069	.0004	.0001	.0017	.0014	2.182	.0024	.0023
#2	.0070	.0009	.0006	.0019	.0010	2.187	.0026	.0010

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0109	.0060	.0000	.0002	.0279	.0404	-.0852	.2747
#1	.0110	.0059	.0001	.0005	.0265	.0775	-.0849	.2779
#2	.0109	.0060	-.0001	-.0001	.0293	.0034	-.0854	.2715

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	.0064	.00018	-.0014	.0024	.0246	.0028	.0152
#1	-.0004	.0109	.00017	-.0010	.0024	.0246	.0028	.0151
#2	.0001	.0019	.00019	-.0018	.0025	.0246	.0028	.0153

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0155	.0016	.5656
#1	.0155	.0002	.5660
#2	.0154	.0029	.5653

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2917.9	79001.	4609.6
#1	2919.6	78975.	4578.4
#2	2916.3	79026.	4640.7

* 1/2500 dilution
Gm
4/14/15

Sample Name: K1503521-001D Acquired: 4/14/2015 10:38:31 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 2 Test Type: Sample Type:
Comment: EM 041415A 1/2

Elem	Al3944	Sb2068	As1890 *	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.161	5.595	>90.00	.0238	-.00042	.0011	-.0204	-.0002
#1	7.167	5.610	734.8	.0238	-.00033	.0006	-.0204	-.0002
#2	7.154	5.581	740.1	.0238	-.00052	.0016	-.0203	-.0002

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0280	.0069	.0012	.0105	.0103	13.71	.0085	.0000
#1	.0280	.0068	.0013	.0107	.0106	13.73	.0081	-.0011
#2	.0279	.0069	.0010	.0103	.0100	13.69	.0089	.0011

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0603	.0356	.0007	.0008	.1565	.2651	-.1992	1.378
#1	.0602	.0355	.0005	.0008	.1579	.2759	-.1981	1.376
#2	.0603	.0358	.0009	.0009	.1551	.2542	-.2004	1.379

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0002	-.0093	.00067	-.0010	.0092	.1591	.0161	.0943
#1	-.0002	-.0123	.00076	-.0013	.0096	.1592	.0165	.0945
#2	-.0003	-.0063	.00059	-.0006	.0088	.1589	.0157	.0941

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0962	.0007	2.605
#1	.0963	.0000	2.606
#2	.0961	.0013	2.603

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2896.6	78852.	4526.2
#1	2894.8	78817.	4542.0
#2	2898.5	78887.	4510.3

*1/500 dilution
aw
4/14/15

Sample Name: K1503521-001S Acquired: 4/14/2015 10:40:50 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 2 Test Type: Sample Type:
Comment: EM 041415A 1/2

Elem	Al3944	Sb2068	As1890 *	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	8.179	6.259	>90.00	1.053	.04981	.4787	.0284	.0482
#1	8.240	6.243	733.8	1.045	.04970	.4767	.0285	.0483
#2	8.118	6.275	735.5	1.060	.04991	.4807	.0283	.0480

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.133	.2111	.4984	.2548	.2721	13.66	.4933	-.0002
#1	5.172	.2116	.4983	.2547	.2721	13.61	.4937	-.0017
#2	5.094	.2106	.4985	.2550	.2720	13.71	.4929	.0012

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	5.081	.5428	.5124	.4940	.1394	5.354	.2434	2.034
#1	5.054	.5418	.5130	.4944	.1364	5.344	.2421	2.042
#2	5.108	.5438	.5117	.4936	.1423	5.365	.2448	2.025

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0499	5.246	.00115	.4851	.0092	.1509	.5347	.5654
#1	.0496	5.280	.00119	.4840	.0101	.1509	.5345	.5662
#2	.0501	5.211	.00110	.4862	.0084	.1509	.5349	.5647

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.5656	.0040	2.841
#1	.5649	.0047	2.835
#2	.5663	.0033	2.847

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2854.6	78279.	4525.5
#1	2844.5	78081.	4576.9
#2	2864.7	78477.	4474.0

* 1/500 dilution
am
4/14/15

Sample Name: K1503521-001A Acquired: 4/14/2015 10:43:01 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 2 Test Type: Sample Type:
Comment: EM 041415A 1/2 A=0.05/10mL ClCV-1,3 + Sb 1000ppm

Elem	Al3944	Sb2068	As1890 *	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.29	10.25	>90.00	5.029	.12123	.0020	1.204	1.216
#1	10.22	10.26	729.5	5.042	.12092	.0019	1.202	1.216
#2	10.36	10.23	735.1	5.017	.12154	.0021	1.205	1.217

Elem	Ca3158	Cr2677	Co2307	Cu2247	Cu3273	Fe2599 **	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	12.51	.5065	1.207	.6059	.6300	13.39	2.385	.0007
#1	12.55	.5045	1.208	.6058	.6285	13.42	2.383	.0009
#2	12.48	.5086	1.207	.6061	.6316	13.36	2.387	.0006

Elem	Mg2852	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	12.65	1.278	.0009	1.194	.1308	12.73	2.003	1.352
#1	12.63	1.279	.0010	1.195	.1328	12.73	2.000	1.350
#2	12.67	1.277	.0009	1.194	.1289	12.74	2.007	1.353

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.5909	12.54	.00093	2.393	.0095	.1258	1.280	1.265
#1	.5897	12.52	.00093	2.392	.0090	.1255	1.282	1.264
#2	.5921	12.56	.00094	2.393	.0100	.1260	1.279	1.267

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	1.255	.0107	2.615
#1	1.255	.0109	2.616
#2	1.254	.0105	2.613

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2839.2	76979.	4451.7
#1	2839.7	76864.	4432.8
#2	2838.8	77094.	4470.7

** N/A
* 1/500 dilution
GWM
4/14/15

Sample Name: K1503521-001 Acquired: 4/14/2015 10:50:06 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 100 Test Type: Sample Type:
Comment: EM 041415A 1/100

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.1052	.1279	>90.00	.0002	-.00006	-.0015	-.0004	-.0001
#1	.1051	.1294	100.8	.0004	-.00002	-.0014	-.0004	-.0001
#2	.1054	.1264	100.4	.0001	-.00010	-.0015	-.0004	-.0001

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0025	.0001	.0003	-.0001	-.0003	.2224	.0002	.0019
#1	.0024	.0000	.0003	-.0005	-.0004	.2219	.0007	.0036
#2	.0025	.0001	.0002	.0002	-.0001	.2230	-.0003	.0002

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0012	.0007	.0002	-.0001	.0021	-.0076	-.0100	.0266
#1	.0013	.0006	.0000	-.0001	.0026	-.0219	-.0080	.0250
#2	.0010	.0007	.0003	-.0001	.0017	.0067	-.0120	.0282

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	-.0075	.00005	-.0006	.0008	.0028	.0005	.0016
#1	-.0003	-.0102	.00011	-.0016	.0003	.0027	.0004	.0017
#2	.0005	-.0048	-.00001	.0004	.0013	.0029	.0006	.0014

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0016	.0011	.0590
#1	.0016	.0000	.0572
#2	.0016	.0022	.0607

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2945.6	79721.	4608.0
#1	2949.4	79994.	4614.3
#2	2941.8	79447.	4601.7

NR
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4/14/15

Sample Name: K1503521-001 Acquired: 4/14/2015 10:58:19 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 500 Test Type: Sample Type:
Comment: EM 041415A 1/500

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0215	.0265	20.96	-.0002	-.00007	-.0017	-.0001	-.0001
#1	.0214	.0278	20.98	-.0001	-.00004	-.0012	-.0002	.0000
#2	.0215	.0253	20.94	-.0003	-.00010	-.0023	.0000	-.0001

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0012	-.0004	.0003	.0000	-.0003	.0460	-.0001	-.0020
#1	.0012	.0001	.0002	-.0001	.0001	.0448	.0009	-.0021
#2	.0012	-.0009	.0004	.0001	-.0007	.0473	-.0011	-.0019

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003	.0001	.0002	-.0001	.0002	-.0070	-.0001	-.0006
#1	.0003	.0001	.0001	.0003	-.0021	-.0207	.0014	.0034
#2	.0003	.0001	.0002	-.0005	.0025	.0066	-.0016	-.0045

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	-.0111	.00007	-.0007	.0001	.0005	.0001	.0004
#1	.0000	-.0076	.00004	-.0016	-.0003	.0006	.0003	.0004
#2	-.0003	-.0146	.00010	.0001	.0005	.0003	-.0001	.0005

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0004	-.0008	.0106
#1	.0004	.0003	.0129
#2	.0004	-.0020	.0083

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2919.5	79738.	4503.7
#1	2921.9	79419.	4529.4
#2	2917.1	80058.	4478.1

Sample Name: CCVB Acquired: 4/14/2015 11:00:47 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.627	9.217	.0025	1.032	9.913	-.00002	-.0020	.0000
Stddev	.064	1.161	.0006	.009	.067	.00005	.0004	.0000
%RSD	.8330	12.60	24.36	.8439	.6760	291.37	19.38	194.8
#1	7.671	8.396	.0030	1.026	9.960	-.00006	-.0023	.0000
#2	7.582	10.04	.0021	1.038	9.865	.00002	-.0017	.0001
Check ?	None	Chk Pass	None	Chk Pass	Chk Pass	None	None	None
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	9.923	9.494	.0000	.0004	-.0001	.0011	10.01
Stddev	.0001	.009	.154	.000	.0001	.0000	.0012	.01
%RSD	69.91	.0903	1.624	102.3	33.36	18.94	115.8	.1358
#1	-.0002	9.917	9.603	.0000	.0005	-.0001	.0019	10.02
#2	-.0001	9.929	9.385	.0000	.0003	-.0001	.0002	10.01
Check ?	None	Chk Pass	None	None	None	None	None	Chk Pass
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0014	1.010	9.543	9.914	10.02	1.009	1.062	.0000
Stddev	.0004	.010	.081	.013	.06	.017	.059	.0004
%RSD	30.48	1.032	.8496	.1267	.6311	1.674	5.551	2580.
#1	.0011	1.003	9.600	9.905	9.976	1.020	1.103	-.0003
#2	.0017	1.018	9.486	9.923	10.07	.9966	1.020	.0003
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None
Value								
Range								

NR-see rerun
am
4/14/15

Sample Name: CCVB Acquired: 4/14/2015 11:00:47 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0007	9.863	10.09	.0005	10.07	-.0001	9.967	.98390
Stddev	.0004	.007	.20	.0019	.12	.0004	.059	.00675
%RSD	56.37	.0669	2.028	355.0	1.235	418.1	.5959	.68613
#1	.0010	9.868	9.948	-.0008	9.986	-.0003	9.925	.97913
#2	.0005	9.858	10.24	.0018	10.16	.0002	10.01	.98868
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	Chk Pass
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0021	.0002	.0006	.0019	.0004	.0002	1.009	1.017
Stddev	.0001	.0007	.0001	.0007	.0001	.0000	.006	.003
%RSD	3.536	285.0	18.60	38.88	25.90	7.213	.5996	.2949
#1	-.0022	-.0002	.0007	.0024	.0004	.0002	1.005	1.015
#2	-.0020	.0007	.0005	.0013	.0003	.0002	1.014	1.019
Check ?	None	None	None	None	None	None	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2874.0	72928.	4474.1
Stddev	20.8	4702.	43.0
%RSD	.72318	6.4472	.96172
#1	2859.3	69604.	4443.7
#2	2888.7	76253.	4504.5

NR- see rerun
GW
4/14/15

Sample Name: CCVB Acquired: 4/14/2015 11:03:59 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: RERUN

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.674	10.72	-.0001	1.036	10.13	-.00005	-.0010	.0001
Stddev	.026	.16	.0015	.004	.01	.00002	.0013	.0001
%RSD	.3349	1.462	1081.	.4079	.0884	42.935	131.5	259.5
#1	7.693	10.83	-.0012	1.033	10.14	-.00006	-.0001	.0002
#2	7.656	10.61	.0009	1.039	10.12	-.00003	-.0018	.0000
Check ?	None	Chk Pass	None	Chk Pass	Chk Pass	None	None	None
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	9.882	9.644	.0001	.0003	-.0004	-.0006	10.05
Stddev	.000	.064	.108	.0005	.0003	.0001	.0006	.01
%RSD	7.242	.6509	1.117	376.0	101.1	24.43	89.23	.1402
#1	.0000	9.927	9.568	.0004	.0004	-.0003	-.0002	10.06
#2	.0000	9.836	9.721	-.0002	.0001	-.0004	-.0011	10.04
Check ?	None	Chk Pass	None	None	None	None	None	Chk Pass
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0015	1.004	10.21	9.790	10.03	.9985	1.002	-.0002
Stddev	.0004	.006	.03	.001	.01	.0017	.003	.0001
%RSD	28.89	.6497	.2839	.0048	.1137	.1667	.3404	67.65
#1	.0012	1.009	10.23	9.790	10.03	.9973	.9995	-.0002
#2	.0018	.9996	10.19	9.790	10.02	.9997	1.004	-.0001
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None
Value								
Range								

Sample Name: CCVB Acquired: 4/14/2015 11:03:59 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: RERUN

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006	10.01	10.04	-.0022	10.13	-.0001	9.978	.98662
Stddev	.0001	.00	.03	.0002	.04	.0006	.015	.00302
%RSD	10.29	.0002	.3152	8.411	.3859	518.2	.1479	.30574
#1	.0006	10.01	10.02	-.0023	10.16	.0003	9.989	.98875
#2	.0006	10.01	10.07	-.0021	10.10	-.0006	9.968	.98448
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	Chk Pass
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	-.0004	.0005	.0007	.0001	.0002	1.016	1.027
Stddev	.0003	.0003	.0002	.0001	.0000	.0001	.003	.001
%RSD	52.60	85.69	40.25	21.39	25.45	40.28	.2870	.1116
#1	-.0004	-.0001	.0006	.0008	.0001	.0003	1.014	1.027
#2	-.0008	-.0006	.0003	.0006	.0001	.0001	1.018	1.026
Check ?	None	None	None	None	None	None	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2869.4	77521.	4430.9
Stddev	9.2	425.	3.5
%RSD	.32118	.54761	.07852
#1	2862.9	77822.	4433.3
#2	2875.9	77221.	4428.4

Sample Name: CCVA Acquired: 4/14/2015 11:06:39 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2533	.2822	.2538	.2711	.2557	.25428	.2533	.2524
Stddev	.0018	.0010	.0037	.0024	.0014	.00134	.0021	.0016
%RSD	.7120	.3586	1.462	.8946	.5292	.52515	.8343	.6483
#1	.2546	.2815	.2564	.2728	.2548	.25522	.2548	.2535
#2	.2520	.2829	.2511	.2694	.2567	.25333	.2518	.2512
Check ?	Chk Pass	None	Chk Pass	None	None	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2545	.5104	.4955	.2539	.2511	.2500	.2519	.2580
Stddev	.0013	.0018	.0022	.0001	.0017	.0015	.0003	.0033
%RSD	.5068	.3522	.4391	.0495	.6801	.5883	.1170	1.279
#1	.2554	.5116	.4940	.2540	.2523	.2510	.2522	.2557
#2	.2536	.5091	.4971	.2538	.2499	.2489	.2517	.2604
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2556	-.0012	.2654	.2527	.2567	.2506	.2484	.2475
Stddev	.0004	.0014	.0051	.0007	.0010	.0014	.0011	.0019
%RSD	.1394	124.6	1.932	.2917	.3805	.5722	.4609	.7698
#1	.2554	-.0022	.2690	.2522	.2574	.2516	.2476	.2488
#2	.2559	-.0001	.2618	.2532	.2560	.2496	.2492	.2461
Check ?	Chk Pass	None	None	Chk Pass	None	Chk Pass	None	Chk Pass
Value								
Range								

Sample Name: CCVA Acquired: 4/14/2015 11:06:39 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2496	-.0026	2.576	.2515	.1113	.2516	.2539	.00014
Stddev	.0011	.0013	.060	.0014	.0010	.0023	.0016	.00014
%RSD	.4481	52.06	2.328	.5491	.8697	.9268	.6215	102.08
#1	.2504	-.0035	2.534	.2525	.1119	.2533	.2550	.00024
#2	.2488	-.0016	2.618	.2506	.1106	.2500	.2527	.00004
Check ?	Chk Pass	None	None	Chk Pass	None	Chk Pass	None	None
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2544	.2505	.2515	.2502	.2530	.2526	.0037	-.0037
Stddev	.0017	.0012	.0002	.0008	.0013	.0017	.0011	.0004
%RSD	.6781	.4695	.0968	.3230	.5063	.6616	30.88	10.64
#1	.2556	.2497	.2513	.2507	.2539	.2537	.0029	-.0034
#2	.2532	.2513	.2517	.2496	.2521	.2514	.0045	-.0039
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2886.5	78626.	4469.6
Stddev	4.8	168.	29.6
%RSD	.16489	.21342	.66338
#1	2889.9	78745.	4490.5
#2	2883.2	78508.	4448.6

Sample Name: CCB Acquired: 4/14/2015 11:08:51 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B 2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	-.0001	-.0010	F .0177	.0004	-.00002	-.0006	.0000
Stddev	.000	.0006	.0025	.0005	.0001	.00001	.0005	.000
%RSD	52.35	1030.	253.6	2.845	25.26	47.431	74.42	2590.
#1	-.0001	.0004	.0008	.0180	.0005	-.00001	-.0003	.0000
#2	.0000	-.0005	-.0028	.0173	.0003	-.00002	-.0010	.0000
Check ?	Chk Pass	None	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				.0100				
Low Limit				-.0100				

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	.0101	.0001	-.0002	-.0002	-.0003	-.0010	.0017
Stddev	.000	.0015	.0001	.0002	.0002	.0003	.0003	.0025
%RSD	276.3	14.56	100.7	103.0	102.7	98.64	32.29	147.5
#1	-.0001	.0091	.0002	-.0004	-.0003	-.0001	-.0007	-.0001
#2	.0000	.0112	.0000	-.0001	-.0001	-.0005	-.0012	.0034
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	-.0010	.0027	-.0001	.0013	.0000	.0005	.0007
Stddev	.0016	.0020	.0075	.0000	.0004	.0001	.0005	.0003
%RSD	315.2	205.9	275.9	14.05	29.21	151.9	97.59	37.76
#1	-.0017	.0004	.0081	-.0001	.0015	.0000	.0009	.0005
#2	.0006	-.0024	-.0026	.0000	.0010	.0001	.0002	.0009
Check ?	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None	Chk Pass
High Limit								
Low Limit								

NR-see rerun
aw
4/14/15

Sample Name: CCB Acquired: 4/14/2015 11:08:51 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0005	.0005	-.0008	-.0016	-.0002	.0020	.00022
Stddev	.0001	.0000	.0217	.0022	.0040	.0001	.0131	.00002
%RSD	34.79	6.639	4017.	277.7	256.9	50.42	670.4	10.221
#1	.0002	.0005	-.0148	.0008	.0013	-.0003	.0112	.00024
#2	.0003	.0005	.0159	-.0023	-.0044	-.0001	-.0073	.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	.0006	-.0001	.0004	.0003	.0000	.0008	-.0013
Stddev	.0013	.0005	.0001	.0001	.0000	.000	.0031	.0001
%RSD	218.6	74.87	156.6	33.89	5.581	379.4	394.7	6.032
#1	-.0015	.0003	.0000	.0005	.0003	.0000	.0030	-.0014
#2	.0003	.0010	-.0002	.0003	.0003	.0000	-.0014	-.0013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2858.3	77704.	4402.1
Stddev	2.8	991.	82.2
%RSD	.09913	1.2751	1.8676
#1	2860.3	77003.	4344.0
#2	2856.3	78404.	4460.3

NR - see rerun
AW
4/14/15

Sample Name: CCB Acquired: 4/14/2015 11:24:01 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: RERUN

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0005	-.0008	F .0103	.0001	-.00007	-.0008	.0000
Stddev	.0000	.0004	.0009	.0029	.0003	.00000	.0001	.000
%RSD	23.20	80.81	112.4	27.86	429.4	2.0635	13.03	114.1
#1	-.0001	.0008	-.0002	.0083	-.0001	-.00007	-.0007	.0000
#2	-.0001	.0002	-.0015	.0123	.0003	-.00008	-.0009	.0000
Check ?	Chk Pass	None	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				.0100				
Low Limit				-.0100				

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0050	-.0001	-.0001	.0000	-.0005	-.0010	.0033
Stddev	.0001	.0021	.0001	.0001	.000	.0002	.0008	.0023
%RSD	102.3	41.56	156.5	47.87	142.9	39.65	75.63	69.13
#1	.0000	.0064	.0000	-.0002	-.0001	-.0004	-.0005	.0017
#2	-.0001	.0035	-.0002	-.0001	.0000	-.0007	-.0015	.0050
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	-.0011	-.0136	-.0001	.0008	.0000	-.0007	.0003
Stddev	.0018	.0015	.0032	.0000	.0010	.000	.0001	.0001
%RSD	973.5	144.1	23.40	48.26	120.2	73.16	18.64	30.97
#1	.0015	-.0022	-.0113	-.0001	.0001	.0000	-.0008	.0004
#2	-.0011	.0000	-.0158	-.0001	.0015	-.0001	-.0006	.0003
Check ?	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None	Chk Pass
High Limit								
Low Limit								

Sample Name: CCB Acquired: 4/14/2015 11:24:01 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: RERUN

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	-.0009	.0205	.0011	.0001	-.0005	.0036	.00005
Stddev	.0000	.0003	.0013	.0040	.0006	.0001	.0025	.00011
%RSD	152.8	33.42	6.261	358.3	660.3	26.51	69.46	238.06
#1	.0000	-.0011	.0214	-.0017	-.0004	-.0004	.0018	-.00003
#2	.0000	-.0007	.0196	.0039	.0005	-.0006	.0053	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	-.0005	-.0001	-.0003	.0000	.0000	-.0005	-.0004
Stddev	.0003	.0005	.0001	.0003	.0002	.000	.0008	.0007
%RSD	68.61	105.4	51.86	98.50	758.2	112.8	156.1	186.5
#1	-.0002	-.0001	-.0001	-.0001	-.0001	-.0001	.0001	-.0009
#2	-.0006	-.0008	-.0001	-.0006	.0002	.0000	-.0010	.0001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2878.9	78451.	4458.2
Stddev	5.0	184.	87.2
%RSD	.17292	.23402	1.9560
#1	2882.4	78321.	4519.9
#2	2875.3	78581.	4396.6

Sample Name: K1503521-001L Acquired: 4/14/2015 11:27:31 Type: Unk
Method: 2015A-ICP03(v7/5) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 2500 Test Type: Sample Type:
Comment: EM 041415A 1/2500

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0047	.0052	4.286	.0001	-.00005	-.0012	-.0001	.0000
#1	.0047	.0052	4.283	-.0001	-.00003	-.0012	.0000	-.0001
#2	.0047	.0052	4.289	.0004	-.00006	-.0013	-.0001	.0001

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0015	.0003	.0002	.0001	-.0012	.0120	-.0004	-.0021
#1	.0015	.0004	.0004	.0002	-.0008	.0120	.0001	-.0033
#2	.0016	.0002	-.0001	-.0001	-.0016	.0120	-.0010	-.0009

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0001	.0000	-.0002	.0000	-.0006	-.0130	.0014	.0028
#1	.0001	.0000	-.0002	-.0002	-.0022	-.0126	.0024	.0017
#2	.0000	.0000	-.0002	.0001	.0010	-.0135	.0005	.0039

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0013	.00003	-.0009	.0003	.0002	.0006	.0001
#1	.0000	-.0050	.00007	-.0005	.0011	.0003	.0007	.0002
#2	-.0003	.0076	-.00002	-.0012	-.0006	.0001	.0006	.0001

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0000	.0021	.0003
#1	.0000	.0013	.0005
#2	.0000	.0029	.0002

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2881.3	78853.	4435.0
#1	2877.9	78833.	4401.6
#2	2884.8	78873.	4468.5

Sample Name: K1503521-001D Acquired: 4/14/2015 11:29:58 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 500 Test Type: Sample Type:
Comment: EM 041415A 1/500

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0287	.0234	21.50	.0006	.00006	-.0030	-.0001	.0000
#1	.0291	.0235	21.53	.0004	.00001	-.0030	-.0001	-.0001
#2	.0284	.0233	21.47	.0007	.00010	-.0030	-.0001	.0000

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0013	-.0002	.0000	-.0003	-.0010	.0591	-.0004	-.0017
#1	.0013	.0001	.0000	-.0004	-.0012	.0587	-.0007	-.0020
#2	.0013	-.0004	.0000	-.0002	-.0008	.0595	-.0002	-.0014

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0002	.0000	.0001	.0006	-.0188	-.0032	-.0009
#1	.0002	.0002	.0001	.0001	.0018	-.0395	-.0035	-.0078
#2	.0002	.0002	-.0001	.0001	-.0005	.0020	-.0028	.0061

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0007	.0067	.00009	.0001	.0002	.0005	.0002	.0005
#1	-.0008	.0162	.00010	-.0003	.0005	.0005	.0005	.0003
#2	-.0006	-.0028	.00009	.0004	-.0002	.0004	.0000	.0006

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0004	.0011	.0113
#1	.0004	.0013	.0079
#2	.0005	.0008	.0146

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2891.4	78831.	4466.1
#1	2889.8	78538.	4469.8
#2	2893.0	79123.	4462.4

Sample Name: K1503521-001S Acquired: 4/14/2015 11:32:22 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 500 Test Type: Sample Type:
Comment: EM 041415A 1/500

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0331	.0281	21.71	.0046	.00017	.0009	.0001	.0003
#1	.0330	.0269	21.74	.0046	.00017	.0015	.0001	.0003
#2	.0332	.0293	21.69	.0046	.00017	.0003	.0001	.0002

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0224	.0007	.0024	.0012	.0001	.0596	.0039	.0007
#1	.0226	.0013	.0021	.0015	.0001	.0596	.0028	.0015
#2	.0223	.0000	.0026	.0009	.0000	.0596	.0051	.0000

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0216	.0022	.0020	.0024	.0000	.0511	.0005	.0128
#1	.0216	.0022	.0017	.0026	-.0009	.0812	.0013	.0040
#2	.0216	.0022	.0022	.0022	.0009	.0210	-.0003	.0216

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0004	.0037	.00003	.0007	.0006	.0005	.0018	.0024
#1	-.0003	.0131	.00003	.0018	.0007	.0003	.0020	.0024
#2	-.0005	-.0057	.00004	-.0003	.0006	.0007	.0017	.0024

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0025	.0001	.0116
#1	.0025	.0012	.0103
#2	.0025	-.0010	.0129

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2897.9	78650.	4428.1
#1	2889.2	78443.	4411.5
#2	2906.6	78858.	4444.6

Sample Name: K1503521-001A Acquired: 4/14/2015 11:34:48 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 500 Test Type: Sample Type:
Comment: EM 041415A 1/500 A= 0.2/10mL As 1000ppm MET2-51-H

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0220	.0246	40.87	.0002	.00005	-.0012	-.0002	.0000
#1	.0221	.0261	40.79	.0003	.00001	-.0006	-.0001	.0000
#2	.0218	.0231	40.96	.0001	.00008	-.0018	-.0002	-.0001

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0028	.0000	.0001	.0001	-.0007	.0448	-.0005	.0015
#1	.0028	.0003	.0000	.0000	-.0003	.0440	-.0011	.0004
#2	.0028	-.0004	.0002	.0002	-.0011	.0456	.0001	.0026

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0003	.0001	.0000	-.0001	.0005	.0067	-.0026	.0013
#1	.0003	.0001	-.0002	-.0001	.0020	-.0075	-.0057	-.0016
#2	.0004	.0001	.0002	.0000	-.0011	.0209	.0004	.0042

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0006	-.0033	.00017	-.0004	.0004	.0006	.0004	.0005
#1	-.0008	-.0068	.00019	-.0005	.0009	.0007	.0003	.0005
#2	-.0005	.0002	.00015	-.0004	.0000	.0006	.0005	.0005

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0005	.0018	.0094
#1	.0005	.0020	.0106
#2	.0004	.0015	.0082

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2906.4	78564.	4472.7
#1	2894.6	79208.	4460.2
#2	2918.3	77920.	4485.3

Sample Name: KQ1503543-03 Acquired: 4/14/2015 11:37:59 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: EM 041415A K1503708-MB1

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0063	-.0003	F .0206	.0010	-.00018	.0009	.0000	-.0002
#1	.0063	-.0026	.0205	.0011	-.00014	.0000	.0000	-.0004
#2	.0063	.0020	.0207	.0010	-.00023	.0019	.0000	-.0001

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F .0210	-.0004	.0002	.0014	-.0005	.0059	.0003	-.0002
#1	.0212	-.0003	.0002	.0015	-.0003	.0074	.0006	.0011
#2	.0209	-.0004	.0003	.0014	-.0007	.0044	.0001	-.0014

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0012	.0001	.0003	.0000	.0284	.0510	.0033	.0026
#1	.0011	.0002	.0002	-.0005	.0279	.0530	.0038	.0016
#2	.0013	.0001	.0003	.0004	.0288	.0490	.0028	.0036

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	-.0070	.00012	-.0028	F .0337	-.0001	.0002	F .0140
#1	-.0002	-.0102	.00014	-.0041	.0347	-.0002	.0003	.0140
#2	-.0003	-.0038	.00010	-.0015	.0327	-.0001	.0002	.0141

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	F .0139	.0019	.0097
#1	.0140	.0019	.0091
#2	.0138	.0019	.0103

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2862.7	78978.	4510.2
#1	2863.4	78636.	4471.4
#2	2862.1	79321.	4549.0

Sample Name: KQ1503543-01 Acquired: 4/14/2015 11:40:25 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: EM 041415A K1503708-LCSW

Elem	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.236	.9406	.9682	2.045	.09406	.9283	.0961	.0966
#1	4.209	.9373	.9647	2.051	.09409	.9275	.0961	.0966
#2	4.263	.9439	.9717	2.040	.09403	.9290	.0960	.0965

Elem	Ca3158	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.772	.4119	.9904	.4817	.4981	2.009	.9792	-.0008
#1	9.778	.4131	.9913	.4825	.4975	2.012	.9814	-.0020
#2	9.767	.4107	.9895	.4810	.4986	2.006	.9770	.0003

Elem	Mg2852	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.968	.9972	1.025	.9646	.0289	10.05	.8657	-.0742
#1	9.993	.9993	1.026	.9664	.0294	10.07	.8633	-.0741
#2	9.943	.9951	1.025	.9627	.0283	10.02	.8680	-.0744

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0925	9.920	.00043	.9621	.0341	.0002	1.021	.9640
#1	.0923	9.961	.00053	.9662	.0347	.0001	1.022	.9653
#2	.0927	9.880	.00034	.9580	.0334	.0002	1.020	.9627

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.9241	.0073	.0103
#1	.9206	.0075	.0082
#2	.9276	.0072	.0125

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2796.7	76965.	4438.4
#1	2785.2	76663.	4435.8
#2	2808.1	77266.	4441.0

Sample Name: KQ1503543-02 Acquired: 4/14/2015 11:42:43 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: EM 041415A K1503708-DLCSW

Elem	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	4.248	.9443	.9769	2.052	.09450	.9334	.0963	.0968
#1	4.234	.9492	.9826	2.054	.09375	.9250	.0961	.0967
#2	4.261	.9395	.9713	2.050	.09524	.9418	.0964	.0970

Elem	Ca3158	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	9.898	.4136	.9956	.4802	.4957	2.028	.9792	-.0016
#1	9.886	.4131	.9947	.4801	.4948	2.021	.9784	-.0017
#2	9.910	.4140	.9966	.4804	.4965	2.034	.9800	-.0016

Elem	Mg2852	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	10.06	1.005	1.039	.9693	.0274	10.12	.8727	-.0698
#1	9.952	1.006	1.040	.9675	.0288	10.03	.8796	-.0746
#2	10.18	1.003	1.038	.9711	.0260	10.22	.8658	-.0650

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0932	10.01	.00031	.9678	.0333	.0001	1.027	.9817
#1	.0925	9.895	.00027	.9707	.0338	.0000	1.030	.9791
#2	.0938	10.12	.00036	.9649	.0327	.0003	1.025	.9842

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.9379	.0060	.0058
#1	.9411	.0064	.0062
#2	.9348	.0056	.0055

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2795.6	76719.	4412.0
#1	2801.2	76158.	4371.4
#2	2789.9	77280.	4452.5

Sample Name: K1503708-001 Acquired: 4/14/2015 11:45:01 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: EM 041415A

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0066	.0038	.0089	.0007	-.00020	.0021	.0003	.0000
#1	.0066	.0041	.0092	.0006	-.00022	.0016	.0003	.0001
#2	.0066	.0036	.0085	.0008	-.00018	.0025	.0003	-.0001

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0410	.0221	.0113	.0064	.0053	18.51	.0019	-.0002
#1	.0410	.0219	.0114	.0066	.0051	18.46	.0024	.0002
#2	.0410	.0223	.0113	.0061	.0055	18.56	.0014	-.0006

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0057	.1642	.0025	.5587	.0432	.0351	.0021	.0062
#1	.0058	.1645	.0025	.5578	.0430	.0229	.0020	.0092
#2	.0056	.1640	.0024	.5596	.0433	.0473	.0022	.0032

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	.0021	.00023	-.0020	.0307	.0052	.0036	.0539
#1	.0000	.0125	.00022	-.0020	.0306	.0055	.0038	.0538
#2	.0000	-.0083	.00024	-.0019	.0307	.0050	.0033	.0539

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0541	.0020	.8639
#1	.0542	.0029	.8717
#2	.0540	.0012	.8560

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2906.7	79082.	4464.0
#1	2918.2	79241.	4458.4
#2	2895.2	78924.	4469.6

Sample Name: K1503708-003 Acquired: 4/14/2015 11:47:24 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: EM 041415A

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0058	.0008	.0035	.0006	-.00016	.0006	.0001	-.0001
#1	.0060	.0006	.0011	.0005	-.00016	-.0006	.0001	-.0002
#2	.0056	.0010	.0059	.0006	-.00017	.0017	.0001	-.0001

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0375	.0227	.0377	.0074	.0059	19.70	.0020	-.0009
#1	.0375	.0231	.0381	.0076	.0059	19.73	.0020	.0010
#2	.0374	.0224	.0373	.0073	.0059	19.68	.0019	-.0028

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0046	.0373	.0025	1.222	.0327	.0237	.0020	.0104
#1	.0047	.0373	.0025	1.227	.0323	-.0166	.0015	.0149
#2	.0045	.0373	.0024	1.217	.0332	.0640	.0026	.0059

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0158	.0049	.00018	-.0021	.0306	.0067	.0148	.0261
#1	.0158	-.0037	.00012	-.0027	.0306	.0068	.0149	.0262
#2	.0158	.0136	.00024	-.0014	.0305	.0067	.0146	.0260

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0263	.0020	.9077
#1	.0264	.0018	.9023
#2	.0262	.0023	.9132

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2888.7	78841.	4461.5
#1	2884.1	79043.	4429.5
#2	2893.3	78639.	4493.5

Sample Name: KQ1503544-01 Acquired: 4/14/2015 11:49:49 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: EM 041415A K1503708-MB2

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F .0104	-.0002	.0073	.0004	-.00001	.0004	.0000	-.0001
#1	.0104	.0002	.0054	.0004	-.00005	.0007	.0000	.0001
#2	.0104	-.0005	.0092	.0003	.00002	.0001	-.0001	-.0003

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0109	-.0006	.0002	F .0048	F .0051	.0080	.0014	-.0005
#1	.0109	-.0004	.0003	.0049	.0045	.0083	.0016	-.0009
#2	.0109	-.0009	.0001	.0047	.0056	.0076	.0012	-.0002

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0012	.0005	.0001	.0003	.0001	.0303	.0009	.0530
#1	.0013	.0005	.0000	.0006	.0017	.0261	.0017	.0496
#2	.0012	.0006	.0001	.0001	-.0014	.0346	.0000	.0563

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	.0328	.00017	-.0018	-.0002	.0002	.0003	.0028
#1	.0000	.0273	.00007	-.0025	-.0002	.0001	.0007	.0029
#2	-.0005	.0382	.00027	-.0011	-.0001	.0004	.0000	.0026

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0026	.0014	.0015
#1	.0026	.0014	-.0007
#2	.0026	.0013	.0037

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2902.6	77954.	4444.7
#1	2901.2	78340.	4461.1
#2	2904.0	77569.	4428.3

Sample Name: CCVB Acquired: 4/14/2015 11:52:17 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	7.667	10.53	.0002	1.019	10.11	-.00004	.0007	.0001
Stddev	.014	.08	.0009	.006	.11	.00001	.0017	.0000
%RSD	.1820	.7216	499.0	.5938	1.064	16.074	234.3	8.000
#1	7.677	10.59	.0008	1.024	10.03	-.00004	-.0005	.0001
#2	7.657	10.48	-.0005	1.015	10.18	-.00003	.0020	.0001
Check ?	None	Chk Pass	None	Chk Pass	Chk Pass	None	None	None
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	9.964	9.622	-.0003	.0002	.0001	-.0004	10.08
Stddev	.000	.007	.372	.0003	.0001	.0001	.0003	.03
%RSD	2159.	.0730	3.861	116.4	38.31	160.3	61.84	.3045
#1	-.0001	9.969	9.359	-.0001	.0002	.0000	-.0006	10.06
#2	.0001	9.959	9.885	-.0005	.0001	.0001	-.0002	10.10
Check ?	None	Chk Pass	None	None	None	None	None	Chk Pass
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0011	1.021	10.00	9.605	10.22	1.002	1.020	.0000
Stddev	.0006	.012	.37	.336	.08	.003	.010	.000
%RSD	52.28	1.195	3.685	3.493	.7840	.2807	.9624	618.1
#1	.0015	1.029	10.26	9.368	10.28	1.004	1.027	.0000
#2	.0007	1.012	9.741	9.842	10.16	.9999	1.013	-.0001
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None
Value								
Range								

Sample Name: CCVB Acquired: 4/14/2015 11:52:17 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0006	9.962	10.21	-.0003	10.28	-.0002	10.12	.99064
Stddev	.0000	.024	.09	.0021	.05	.0002	.14	.00131
%RSD	2.373	.2401	.8724	609.6	.5275	63.39	1.378	.13183
#1	.0006	9.979	10.27	-.0018	10.31	-.0001	10.22	.99156
#2	.0006	9.945	10.14	.0011	10.24	-.0004	10.02	.98971
Check ?	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	Chk Pass
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0005	.0004	.0005	.0012	.0001	.0001	1.011	1.030
Stddev	.0010	.0006	.0000	.0005	.0000	.0000	.005	.004
%RSD	219.4	130.5	.7799	39.84	.8412	26.36	.5101	.4235
#1	-.0012	.0000	.0005	.0015	.0001	.0001	1.015	1.033
#2	.0003	.0008	.0005	.0009	.0001	.0002	1.008	1.027
Check ?	None	None	None	None	None	None	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2885.9	77415.	4478.1
Stddev	3.1	141.	59.6
%RSD	.10706	.18182	1.3310
#1	2888.0	77515.	4520.3
#2	2883.7	77316.	4436.0

Sample Name: CCVA Acquired: 4/14/2015 11:54:50 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2543	.2816	.2534	.2605	.2582	.25813	.2563	.2532
Stddev	.0030	.0026	.0044	.0014	.0024	.00320	.0028	.0017
%RSD	1.174	.9105	1.754	.5260	.9482	1.2383	1.082	.6553
#1	.2564	.2798	.2565	.2615	.2565	.25587	.2543	.2544
#2	.2522	.2835	.2502	.2595	.2599	.26039	.2582	.2520
Check ?	Chk Pass	None	Chk Pass	None	None	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2552	.5086	.5030	.2590	.2520	.2504	.2526	.2632
Stddev	.0009	.0020	.0057	.0018	.0017	.0011	.0031	.0019
%RSD	.3435	.3979	1.136	.6984	.6864	.4506	1.240	.7391
#1	.2558	.5072	.4989	.2603	.2533	.2512	.2504	.2646
#2	.2546	.5100	.5070	.2577	.2508	.2496	.2548	.2618
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
Value								
Range								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2536	-.0006	.2665	.2543	.2670	.2571	.2576	.2482
Stddev	.0012	.0015	.0271	.0023	.0023	.0004	.0058	.0014
%RSD	.4882	239.3	10.17	.9219	.8668	.1644	2.233	.5798
#1	.2545	-.0017	.2473	.2526	.2687	.2568	.2616	.2492
#2	.2527	.0004	.2856	.2560	.2654	.2574	.2535	.2472
Check ?	Chk Pass	None	None	Chk Pass	None	Chk Pass	None	Chk Pass
Value								
Range								

Sample Name: CCVA Acquired: 4/14/2015 11:54:50 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2505	.0000	2.609	.2544	.1205	.2558	.2682	.00016
Stddev	.0016	.001	.025	.0026	.0004	.0028	.0015	.00012
%RSD	.6214	2297.	.9568	1.009	.3699	1.084	.5531	75.904
#1	.2516	-.0006	2.627	.2562	.1208	.2538	.2692	.00007
#2	.2494	.0006	2.592	.2526	.1202	.2578	.2671	.00024
Check ?	Chk Pass	None	None	Chk Pass	None	Chk Pass	None	None
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.2515	.2523	.2557	.2540	.2536	.2538	.0007	-.0027
Stddev	.0027	.0002	.0006	.0001	.0008	.0012	.0006	.0015
%RSD	1.061	.0682	.2414	.0209	.3196	.4634	84.16	56.47
#1	.2534	.2524	.2561	.2540	.2542	.2546	.0010	-.0016
#2	.2496	.2522	.2553	.2541	.2531	.2530	.0003	-.0038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2900.2	78236.	4538.2
Stddev	11.0	746.	77.7
%RSD	.38065	.95377	1.7118
#1	2892.4	77709.	4593.1
#2	2908.0	78764.	4483.2

Sample Name: CCB Acquired: 4/14/2015 11:57:04 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0003	-.0011	-.0016	.0043	.0005	-.00003	-.0003	.0000
Stddev	.0001	.0008	.0000	.0013	.0000	.00000	.0009	.000
%RSD	22.96	73.76	1.357	29.27	9.639	16.138	341.0	1.085
#1	-.0002	-.0017	-.0016	.0052	.0005	-.00002	.0004	.0000
#2	-.0003	-.0005	-.0015	.0034	.0004	-.00003	-.0009	.0000
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0000	.0134	.0002	-.0005	.0003	-.0001	-.0010	.0019
Stddev	.000	.0020	.0001	.0004	.0003	.0006	.0003	.0006
%RSD	266.8	14.58	71.88	81.89	109.2	820.7	30.00	32.88
#1	.0000	.0120	.0002	-.0008	.0001	-.0005	-.0008	.0024
#2	.0000	.0148	.0001	-.0002	.0005	.0004	-.0012	.0015
Check ?	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0005	-.0005	-.0023	-.0001	.0010	.0001	.0011	.0008
Stddev	.0003	.0027	.0211	.0001	.0012	.0000	.0003	.0000
%RSD	66.61	605.3	919.6	85.92	119.8	33.67	31.26	.6067
#1	.0007	-.0024	.0126	.0000	.0018	.0001	.0009	.0008
#2	.0003	.0015	-.0172	-.0002	.0002	.0001	.0013	.0008
Check ?	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None	Chk Pass
High Limit								
Low Limit								

Sample Name: CCB Acquired: 4/14/2015 11:57:04 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0002	.0006	-.0101	.0000	.0015	.0001	.0087	.00007
Stddev	.0001	.0016	.0015	.002	.0048	.0000	.0041	.00002
%RSD	35.49	259.2	14.96	17380.	316.2	26.05	47.69	27.238
#1	.0002	-.0005	-.0090	-.0015	.0049	.0001	.0116	.00008
#2	.0003	.0017	-.0111	.0015	-.0019	.0001	.0057	.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0012	.0007	.0000	-.0002	.0000	-.0001	.0008	-.0027
Stddev	.0000	.0010	.0001	.0000	.000	.0001	.0021	.0011
%RSD	1.255	137.5	534.3	.4568	298.4	112.4	253.5	41.27
#1	-.0012	.0000	-.0001	-.0002	.0000	.0000	.0024	-.0034
#2	-.0011	.0014	.0001	-.0002	-.0001	-.0001	-.0007	-.0019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2886.6	78478.	4432.2
Stddev	8.1	97.	8.1
%RSD	.28179	.12408	.18207
#1	2892.4	78409.	4426.5
#2	2880.9	78547.	4437.9

Sample Name: LLCCV Acquired: 4/14/2015 12:00:38 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Al1670	Al3944	Sb2068	As1890 *	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0106	.0105	.0215	F .0134	.0045	.00102	.0209	.0010
Stddev	.0001	.0029	.0007	.0006	.0002	.00001	.0005	.0000
%RSD	.5665	27.52	3.234	4.312	3.713	.81466	2.358	4.202
#1	.0107	.0084	.0210	.0138	.0044	.00103	.0206	.0010
#2	.0106	.0125	.0220	.0130	.0047	.00102	.0213	.0010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				.0100				
Range				30.00%				

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0010	F .0334	.0214	.0044	.0022	.0035	.0034	.0193
Stddev	.0001	.0102	.0001	.0006	.0003	.0001	.0003	.0027
%RSD	9.609	30.62	.4751	12.58	15.10	2.422	10.20	14.19
#1	.0011	.0261	.0215	.0048	.0020	.0036	.0032	.0212
#2	.0009	.0406	.0213	.0040	.0025	.0034	.0037	.0173
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value		.0200						
Range		30.00%						

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0108	.0203	.0100	.0051	.0068	.0010	.0000	.0042
Stddev	.0008	.0016	.0139	.0001	.0020	.0000	.001	.0003
%RSD	7.638	7.714	139.4	1.539	28.92	.4059	4654.	6.868
#1	.0114	.0215	.0001	.0050	.0081	.0010	.0005	.0040
#2	.0102	.0192	.0198	.0051	.0054	.0010	-.0006	.0044
Check ?	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None	Chk Pass
Value								
Range								

*rerun
am
4/14/15

Sample Name: LLCCV Acquired: 4/14/2015 12:00:38 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment:

Elem	Ni2216	P_1782	K_7664 *	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0042	.0386	F .2641	.0203	.2059	.0043	.2165	.00115
Stddev	.0000	.0025	.0036	.0001	.0073	.0002	.0048	.00004
%RSD	.4001	6.370	1.348	.7115	3.538	4.019	2.235	3.2631
#1	.0042	.0368	.2616	.0202	.2111	.0044	.2199	.00112
#2	.0043	.0403	.2667	.0204	.2008	.0042	.2131	.00117
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.2000					
Range			30.00%					

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0090	.0214	.0021	.0041	.0043	.0042	.0236	.0408
Stddev	.0005	.0007	.0001	.0005	.0000	.0001	.0018	.0043
%RSD	5.552	3.084	2.699	11.50	.3303	3.471	7.621	10.64
#1	.0086	.0209	.0020	.0044	.0043	.0041	.0223	.0378
#2	.0093	.0219	.0021	.0037	.0043	.0043	.0248	.0439
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2900.5	78784.	4494.2
Stddev	9.2	575.	12.3
%RSD	.31806	.72990	.27403
#1	2894.0	79191.	4485.5
#2	2907.1	78378.	4502.9

*rerun
am
4/14/15

Sample Name: LLCCV Acquired: 4/14/2015 12:05:28 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: RERUN

Elem	Al1670	Al3944	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0107	.0100	.0202	.0125	.0044	.00101	.0195	.0011
Stddev	.0001	.0013	.0058	.0006	.0003	.00006	.0004	.0000
%RSD	.7080	13.36	28.85	4.758	5.929	5.5603	1.935	1.286
#1	.0107	.0090	.0161	.0121	.0046	.00097	.0198	.0011
#2	.0106	.0109	.0243	.0129	.0043	.00105	.0192	.0011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Cd2265	Ca3158	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0010	F .0264	.0215	.0039	.0023	.0040	.0034	.0250
Stddev	.0001	.0046	.0001	.0005	.0001	.0003	.0003	.0017
%RSD	5.136	17.32	.4549	12.34	4.811	8.330	8.442	6.812
#1	.0010	.0232	.0216	.0035	.0022	.0043	.0032	.0262
#2	.0011	.0297	.0215	.0042	.0024	.0038	.0036	.0238
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value		.0200						
Range		30.00%						

Elem	Pb2203	Li6707	Mg2790	Mg2795	Mg2852	Mn2576	Mn2605	Mo2020
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0111	.0209	.0095	.0051	.0073	.0010	.0004	.0043
Stddev	.0009	.0017	.0126	.0000	.0005	.0000	.0000	.0003
%RSD	8.497	8.157	133.1	.2364	7.204	3.287	.0952	7.968
#1	.0118	.0221	.0184	.0051	.0077	.0010	.0004	.0040
#2	.0104	.0197	.0006	.0051	.0070	.0010	.0004	.0045
Check ?	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass	None	Chk Pass
Value								
Range								

Sample Name: LLCCV Acquired: 4/14/2015 12:05:28 Type: QC
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: RERUN

Elem	Ni2216	P_1782	K_7664	Se1960	Si2516	Ag3280	Na5895	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0043	.0392	.2049	.0206	.2043	.0038	.2094	.00118
Stddev	.0004	.0025	.0079	.0020	.0024	.0004	.0027	.00011
%RSD	8.568	6.436	3.849	9.920	1.170	9.845	1.307	9.5120
#1	.0045	.0410	.1994	.0192	.2060	.0036	.2075	.00126
#2	.0040	.0374	.2105	.0221	.2027	.0041	.2114	.00110
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Tl1908	Sn1899	Ti3361	V_2924	Zn2062	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0103	.0205	.0021	.0038	.0042	.0042	.0228	.0423
Stddev	.0016	.0001	.0001	.0002	.0003	.0000	.0007	.0008
%RSD	15.89	.5048	2.562	4.708	6.248	.6236	2.930	1.959
#1	.0091	.0206	.0021	.0037	.0040	.0042	.0233	.0417
#2	.0114	.0204	.0021	.0040	.0044	.0042	.0223	.0429
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2896.0	78201.	4463.5
Stddev	26.0	18.	50.2
%RSD	.89925	.02285	1.1237
#1	2914.4	78189.	4499.0
#2	2877.6	78214.	4428.0

Sample Name: 900ppm As Acquired: 4/14/2015 17:13:21 Type: Unk
Method: 2015A-ICP03(v75) Mode: CONC Corr. Factor: 1.000000
User: admin Dilution: 1 Test Type: Sample Type:
Comment: EM 041415A 9/10mL As 1000ppm MET2-51-H

Elem	Al1670	Sb2068	As1890	Ba4554	Be2348	B_2496	Cd2144	Cd2265
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0043	-.0018	>90.00	.0003	-.00022	-.0015	-.0026	-.0002
#1	.0046	-.0029	493.2	.0003	-.00020	-.0018	-.0025	-.0002
#2	.0040	-.0006	496.1	.0003	-.00023	-.0013	-.0026	-.0002

Elem	Ca3933	Cr2677	Co2307	Cu2247	Cu3273	Fe2599	Pb2203	Li6707
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0079	.0000	.0003	.0670	.0689	.0013	.0017	-.0027
#1	.0079	-.0002	.0004	.0674	.0693	-.0005	.0007	-.0042
#2	.0080	.0002	.0002	.0666	.0686	.0030	.0028	-.0011

Elem	Mg2795	Mn2576	Mo2020	Ni2216	P_1782	K_7664	Se1960	Si2516
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.0008	.0010	.0001	.0003	.0013	.1063	-.0758	.0054
#1	.0008	.0010	.0002	.0006	.0017	.0551	-.0767	.0019
#2	.0009	.0010	.0001	-.0001	.0010	.1574	-.0749	.0090

Elem	Ag3280	Na5895	Sr4077	Tl1908	Sn1899	Ti3361	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.0001	.0083	.00012	-.0014	.0011	.0000	.0001	.0039
#1	.0000	.0097	.00010	-.0021	.0011	-.0001	-.0002	.0038
#2	-.0002	.0068	.00014	-.0008	.0011	.0001	.0005	.0040

Elem	Zn2138	Bi2230	S_1820
Units	ppm	ppm	ppm
Avg	.0040	.0014	.0418
#1	.0040	.0037	.0412
#2	.0040	-.0009	.0424

Int. Std.	Y_2243	Y_3600	Y_3600-2
Units	Cts/S	Cts/S	Cts/S
Avg	2861.3	78510.	4470.4
#1	2857.5	78509.	4463.1
#2	2865.0	78511.	4477.7

NR- no additional corrections required
AM
4/14/15

Service Request # K1503521 (1/100)
Calibration 041715A
QC in calibration 041715A
QC Service Request # K1503521
STARLIMS run # 440949

ICP-MS Data Review Form

	Yes	No	NA
1. Appropriate standardization completed	X		
2. ICV within 10 % of true value	X		
3. CCV's in control	X		
4. CCB's and/or ICB's below MRL	X		
5. Method blank below MRL	X		
6. LCS in control	X		
7. Spike and duplicate in control	X		
8. All analytes within instrument linear range	X		
9. Adequate rinse out time allowed	X		
10. Internal standards in control	X		
11. Interferences checked	X		
12. Se over MRL		X	
13. LLICV run	X		
14. Cd Correction Applied		X	
15. ICSA and ICSAB in control	X		
16. Serial dilution run	X		
17. Post spike in control	X		
18. Was run stop prematurely, If so why?		X	

Comments: Report As from ICP.
Zn MRL=2X.

Primary Review By: [illegible] Date: 4/17/15
Secondary Review By: [illegible] Date: 4/17/15

R:\icp\misc\data review forms\icpms review form

Data Review Form

Service Request #: **K1503521**
Instrument ID#: **K-ICP-MS-05**
DataFile Name: **R:\ICP\WIP\DATA\K-ICP-MS-05 (Agilent)\041715A.csv**
RUNNO: **440949**

K1503521-001 - Metals T
Passing LLCCV
No passing LLCCV - 66 Zn [He] for Spec 76858 v. 3
K1503521-001SDL - Metals T
Passing LLCCV
No passing LLCCV - 66 Zn [He] for Spec 76858 v. 3 LLCCV @ 2X for Zn
Serial Dillution
Serial Dillution parent not found for Spec 76858 v. 3
Serial Dillution parent not found for Spec 76858 v. 3
K1503521-001PS - Metals T
Passing LLCCV
No passing LLCCV - 66 Zn [He] for Spec 76858 v. 3
PS Recovery
Spec 76858 v. 3 - 111 Cd [He] - Recovery: 0 Limits: 80 - 120 105%
Spec 76858 v. 3 - 114 Cd [He] - Recovery: 0 Limits: 80 - 120 104%

Analytical Method 6020A

Primary Approver: [illegible] 4/17/15
Secondary Approver:

US EPA Tune Check Sample Report

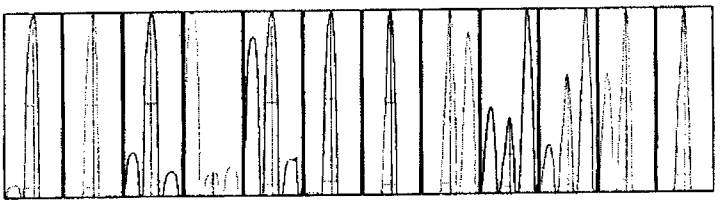
Batch Folder D:\Data\Experiments\041715A.b
Report Comment ALS Tune
Instrument Name G3281A JP13482848

[No Gas]

Mass	Count (Mean)	RSD% (Actual)	RSD% (Required)	RSD% (Flag)
7	190472	0.91	5.00	
9	74218	0.70	5.00	
24	319805	0.58	5.00	
25	42356	0.58	5.00	
26	49015	0.31	5.00	
59	484101	0.64	5.00	
115	696981	0.98	5.00	
206	174180	0.74	5.00	
207	153520	1.16	5.00	
208	372913	1.03	5.00	
209	577566	0.59	5.00	
238	788385	0.75	5.00	

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
7	190505	188453	192385	189066	191952
9	74782	73483	73951	74261	74613
24	319759	322147	320866	318962	317291
25	42405	42507	42324	41955	42592
26	49049	48938	48808	49070	49211
59	486483	483624	482058	487911	480431
115	704804	699270	691807	700901	688123
206	175191	175474	174302	173685	172249
207	154712	155322	153829	150765	152972
208	377514	371012	376637	369532	369872
209	581081	579854	578397	575933	572565
238	795463	786875	783836	793573	782177

Integration Time [sec] = 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	Width-X% (Actual)	Width-X% (Required)	Width-X% (Flag)
7	30921	7.05	6.9 - 7.1		0.785	0.900	
9	12464	9.05	8.9 - 9.1		0.814	0.900	
24	50748	23.90	23.9 - 24.1		0.787	0.900	
25	6769	24.95	24.9 - 25.1		0.787	0.900	
26	7814	25.95	25.9 - 26.1		0.786	0.900	
59	81870	58.95	58.9 - 59.1		0.798	0.900	
115	131195	115.00	114.9 - 115.1		0.770	0.900	
206	34023	206.00	205.9 - 206.1		0.810	0.900	
207	29742	207.00	206.9 - 207.1		0.779	0.900	
208	72583	208.00	207.9 - 208.1		0.778	0.900	
209	114061	209.00	208.9 - 209.1		0.774	0.900	
238	149203	238.00	237.9 - 238.1		0.821	0.900	

X% = 5 **Integration Time [sec] =** 0.1 **Acquisition Time [sec] =** 279 **Y Axis =** Linear

Tune Parameters

Plasma Paramters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
RF Power	1600	W	Carrier Gas	0.57	L/min			
RF Matching	1.76	V	Option Gas	0.0	%			
Smpl Depth	8.0	mm	Nebulizer Pump	0.10	rps			
S/C Temp	2	°C						

Lenses Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Extract 1	0.0	V	Omega Lens	7.6	V			
Extract 2	-165.0	V	Cell Entrance	-30	V			
Omega Bias	-90	V	Cell Exit	-50	V			
Deflect	12.8	V						

Cell Parameters

ParameterName	Value	Unit	ParameterName	Value	Unit	ParameterName	Value	Unit
Use Gas	false		3rd Gas Flow	0	%			
He Flow	0.0	mL/min	OctP Bias	-8.0	V			
H2 Flow	0.0	mL/min	OctP RF	200	V			
Energy Discrimination	5.0	V						

	Sample						
		Rjct	Data File	Acq. Date-Time	Type	Sample Name	Comment
1			001CALB.	4/17/2015 9:54:24 AM	CalBlk	Prime	
2			002CALB.	4/17/2015 9:58:14 AM	CalBlk	Rinse	
3			003CALB.	4/17/2015 10:01:58 AM	CalBlk	Rinse	
4			004CALB.	4/17/2015 10:05:43 AM	CalBlk	Blank	
5			005CALS.	4/17/2015 10:09:29 AM	CalStd	25ppb	
6			006_ICV.d	4/17/2015 10:13:13 AM	ICV	ICV	
7			007_CCV.	4/17/2015 10:16:57 AM	CCV	CCV	
8			008_ICB.d	4/17/2015 10:20:41 AM	ICB	ICB	
9			009_CCB.	4/17/2015 10:24:26 AM	CCB	CCB	
10			010LICV.d	4/17/2015 10:28:10 AM	LLICV	LLICVS	
11			011ICSA.d	4/17/2015 10:31:54 AM	ICSA	ICSA	
12			012ICSB.d	4/17/2015 10:35:38 AM	ICSB	ICSAB	
13			013_PB.d	4/17/2015 10:39:23 AM	PB	KQ1503665-02	5
14			014SMPL.	4/17/2015 10:43:07 AM	Sample	K1503503-001A	5 +200ppb
15			015_CCV.	4/17/2015 10:50:57 AM	CCV	CCV	
16			016_CCB.	4/17/2015 10:54:42 AM	CCB	CCB	
17			017LCCV.	4/17/2015 10:58:26 AM	LLCCV	LLCCVS	
18			019LCCV.	4/17/2015 11:05:25 AM	LLCCV	LLCCVS	
19			020LCCV.	4/17/2015 11:12:16 AM	LLCCV	LLCCVS	
20			021_PB.d	4/17/2015 11:16:05 AM	PB	KQ1503409-02	5
21			022_ARF.d	4/17/2015 11:19:50 AM	AllRef	K1503521-001	500
22			023SMPL.	4/17/2015 11:23:33 AM	Sample	K1503521-001D	500
23			024SMPL.	4/17/2015 11:27:15 AM	Sample	K1503521-001L	2500
24			025_PDS.d	4/17/2015 11:30:56 AM	PDS	K1503521-001A	500 +50ppb +10ppb Ag
25			026SMPL.	4/17/2015 11:34:37 AM	Sample	K1503521-001S	500
26			027SMPL.	4/17/2015 11:38:32 AM	Sample	RINSE	
27			028_QCS.	4/17/2015 11:42:18 AM	QCS	KQ1503409-01	20
28			029_CCV.	4/17/2015 11:46:02 AM	CCV	CCV	
29			030_CCB.	4/17/2015 11:49:47 AM	CCB	CCB	
30			031_CCB.	4/17/2015 11:53:33 AM	CCB	CCB	
31			033LCCV.	4/17/2015 12:00:19 PM	LLCCV	LLCCVS	
32			034_ARF.d	4/17/2015 12:29:34 PM	AllRef	K1503521-001	100
33			035SMPL.	4/17/2015 12:33:15 PM	Sample	K1503521-001D	100
34			036SMPL.	4/17/2015 12:36:56 PM	Sample	K1503521-001L	500
35			037_PDS.d	4/17/2015 12:40:36 PM	PDS	K1503521-001A	100 +50ppb +10ppb Ag
36			038SMPL.	4/17/2015 12:44:16 PM	Sample	K1503521-001S	100
37			039SMPL.	4/17/2015 12:47:57 PM	Sample	RINSE	
38			040_CCV.	4/17/2015 12:51:42 PM	CCV	CCV	
39			041_CCB.	4/17/2015 12:55:25 PM	CCB	CCB	
40			042LCCV.	4/17/2015 12:59:10 PM	LLCCV	LLCCVS	

	Sample						
		Rict	Data File	Acq. Date-Time	Type	Sample Name	Comment
41			043LCCV.	4/17/2015 1:02:57 PM	LLCCV	LLCCVS	
42			044LCCV.	4/17/2015 1:06:41 PM	LLCCV	LLCCVS	
43			045_QC1.d	4/17/2015 1:10:26 PM	QC1	LLCCVS 0.5	

	Analyte			
	Name	Mass	ISTD	Tune Mode
1	Be	9	45	No Gas
2	V	51	72	He
3	Cr	52	72	He
4	Cr	53	72	He
5	Mn	55	72	He
6	Co	59	72	He
7	Ni	60	72	He
8	Ni	62	72	He
9	Cu	63	72	He
10	Cu	65	72	He
11	Zn	66	72	He
12	As	75	72	He
13	Se	77	72	H2
14	Se	78	72	H2
15	Mo	95	115	He
16	Mo	97	115	He
17	Mo	98	115	He
18	Ag	107	115	He
19	Ag	109	115	He
20	Cd	111	115	He
21	Cd	114	115	He
22	Sb	121	115	He
23	Sb	123	115	He
24	Ba	135	115	He
25	Ba	137	115	He
26	Tl	203	175	He
27	Tl	205	175	He
28	[Pb]	206	175	He
29	[Pb]	207	175	He
30	Pb	208	175	He
31	Li	6		No Gas
32	Sc	45		No Gas
33	Sc	45		He
34	Sc	45		H2
35	Ga	71		H2

Analyte				
Name		Mass	ISTD	Tune Mode
36	Ge	72		No Gas
37	Ge	72		He
38	Ge	72		H2
39	Y	89		He
40	Rh	103		He
41	In	115		He
42	Lu	175		He
43	Th	232		He

Calibration Blank Report

Sample Table

Sample Name	Blank
Data File Name	004CALB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:05:43-07:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Mode	CPS	%RSD
Be	9	No Gas	19	137.29
V	51	He	142	0.95
Cr	52	He	451	3.03
Cr	53	He	100	23.09
Mn	55	He	37	65.62
Co	59	He	73	27.01
Ni	60	He	311	3.78
Ni	62	He	57	27.45
Cu	63	He	919	0.76
Cu	65	He	459	3.14
Zn	66	He	883	0.82
As	75	He	12	152.94
Se	77	H2	1119	0.47
Se	78	H2	6	179.80
Mo	95	He	8	841.82
Mo	97	He	7	1299.04
Mo	98	He	16	286.79
Ag	107	He	8	1386.17
Ag	109	He	13	374.91
Cd	111	He	5	529.15
Cd	114	He	17	36.73
Sb	121	He	198	3.67
Sb	123	He	162	18.29
Ba	135	He	23	340.92
Ba	137	He	29	94.38
Tl	203	He	71	30.45
Tl	205	He	237	1.19
[Pb]	206	He	189	5.31
[Pb]	207	He	189	6.22
Pb	208	He	878	0.20

4/17/15

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD
Sc	45	No Gas	6622263	1.08
Ge	72	He	136097	0.66
Ge	72	H2	1259132	1.94
In	115	He	1344886	1.25
Lu	175	He	3597679	1.59
Th	232	He	6454831	1.49

Calibration Standard Report

Sample Table

Sample Name	25ppb
Data File Name	005CALS.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:09:29-07:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	CPS	%RSD
Be	9	No Gas	147297	0.00
V	51	He	94491	0.00
Cr	52	He	127461	0.00
Cr	53	He	15784	0.01
Mn	55	He	50754	0.00
Co	59	He	228219	0.00
Ni	60	He	65204	0.00
Ni	62	He	10259	0.02
Cu	63	He	188903	0.00
Cu	65	He	93665	0.00
Zn	66	He	24150	0.00
As	75	He	14100	0.01
Se	77	H2	7348	0.04
Se	78	H2	20135	0.01
Mo	95	He	92957	0.00
Mo	97	He	59943	0.00
Mo	98	He	157764	0.00
Ag	107	He	327007	0.00
Ag	109	He	324948	0.00
Cd	111	He	39136	0.00
Cd	114	He	101557	0.00
Sb	121	He	101229	0.00
Sb	123	He	81760	0.00
Ba	135	He	18073	0.01
Ba	137	He	32853	0.00
Tl	203	He	330258	0.00
Tl	205	He	811522	0.00
[Pb]	206	He	255032	0.00
[Pb]	207	He	224056	0.00
Pb	208	He	1030009	0.00

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6673108	4.71	6622263	100.77	70	125	
Ge	72	He	136530	0.97	136097	100.32	70	125	
Ge	72	H2	1253670	2.21	1259132	99.57	70	125	
In	115	He	1352798	1.26	1344886	100.59	70	125	
Lu	175	He	3670124	1.14	3597679	102.01	70	125	
Th	232	He	6554969	2.64	6454831	101.55	70	125	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICV
Data File Name	006_ICV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:13:13-07:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	2.558	1.147	15347	2.43	2.5	102	
V	51	He	25.437	0.079	96794	0.37	25	102	
Cr	52	He	10.535	1.103	54339	1.36	10	105	
Cr	53	He	10.536	2.410	6755	2.73	10	105	
Mn	55	He	25.895	1.952	52925	1.80	25	104	
Co	59	He	25.759	0.206	236738	0.20	25	103	
Ni	60	He	25.968	0.546	68169	0.20	25	104	
Ni	62	He	25.608	0.315	10577	0.63	25	102	
Cu	63	He	12.966	1.586	99077	1.93	12.5	104	
Cu	65	He	12.942	2.089	49040	2.36	12.5	104	
Zn	66	He	25.615	1.567	24890	1.27	25	102	
As	75	He	25.930	1.754	14721	1.40	25	104	
Se	77	H2	26.592	3.123	7818	1.41	25	106	
Se	78	H2	25.935	1.218	21082	0.68	25	104	
Mo	95	He	25.630	1.491	94315	0.84	25	103	
Mo	97	He	26.160	1.331	62070	0.94	25	105	
Mo	98	He	26.351	1.229	164563	0.80	25	105	
Ag	107	He	13.188	1.010	170706	0.29	12.5	106	
Ag	109	He	13.144	2.384	169060	1.72	12.5	105	
Cd	111	He	13.350	0.561	20684	0.40	12.5	107	
Cd	114	He	13.424	0.238	53974	0.51	12.5	107	
Sb	121	He	25.443	1.127	101941	0.62	25	102	
Sb	123	He	25.543	1.211	82666	0.54	25	102	
Ba	135	He	105.593	1.425	75465	0.77	100	106	
Ba	137	He	105.659	1.602	137293	1.46	100	106	
Tl	203	He	25.886	1.979	334463	0.66	25	104	
Tl	205	He	25.973	2.244	824574	0.90	25	104	
[Pb]	206	He	26.113	2.376	260487	1.04	25	104	
[Pb]	207	He	27.107	1.503	237557	0.35	25	108	
Pb	208	He	26.617	1.676	1072390	0.64	25	106	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6776957	1.98	6622263	102.34	70	125	
Ge	72	He	137443	0.36	136097	100.99	70	125	
Ge	72	H2	1265222	1.74	1259132	100.48	70	125	
In	115	He	1338608	0.72	1344886	99.53	70	125	
Lu	175	He	3589588	1.36	3597679	99.78	70	125	
Th	232	He	6376180	1.23	6454831	98.78	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	007_CCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:16:57-07:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	25.028	1.934	146442	0.29	25	100	
V	51	He	24.354	1.484	94037	1.18	25	97	
Cr	52	He	24.571	0.460	127981	0.85	25	98	
Cr	53	He	24.629	1.523	15884	1.35	25	99	
Mn	55	He	24.467	1.185	50742	0.82	25	98	
Co	59	He	24.370	0.750	227270	0.97	25	97	
Ni	60	He	24.758	2.189	65960	1.90	25	99	
Ni	62	He	24.476	2.635	10260	2.38	25	98	
Cu	63	He	24.437	1.460	188630	1.50	25	98	
Cu	65	He	24.600	1.445	94158	1.36	25	98	
Zn	66	He	24.744	2.043	24429	1.78	25	99	
As	75	He	24.807	1.608	14291	1.27	25	99	
Se	77	H2	25.021	0.757	7484	1.83	25	100	
Se	78	H2	24.482	2.103	20060	1.14	25	98	
Mo	95	He	24.898	0.926	92973	0.43	25	100	
Mo	97	He	25.036	1.948	60272	1.14	25	100	
Mo	98	He	25.076	0.721	158916	0.92	25	100	
Ag	107	He	25.022	1.481	328647	1.02	25	100	
Ag	109	He	24.893	0.253	324913	1.19	25	100	
Cd	111	He	25.123	1.299	39490	0.41	25	100	
Cd	114	He	24.725	0.720	100857	0.33	25	99	
Sb	121	He	25.351	0.405	103073	0.66	25	101	
Sb	123	He	25.271	1.224	82996	1.35	25	101	
Ba	135	He	24.802	2.047	18003	1.21	25	99	
Ba	137	He	25.412	1.995	33527	1.22	25	102	
Tl	203	He	25.290	0.988	326752	1.29	25	101	
Tl	205	He	25.312	1.372	803637	1.96	25	101	
[Pb]	206	He	25.521	0.963	254607	1.73	25	102	
[Pb]	207	He	25.455	1.468	223084	1.82	25	102	
Pb	208	He	25.503	0.952	1027473	1.09	25	102	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6619653	1.87	6622263	99.96	70	125	
Ge	72	He	139463	0.41	136097	102.47	70	125	
Ge	72	H2	1275511	2.42	1259132	101.30	70	125	
In	115	He	1358333	0.94	1344886	101.00	70	125	
Lu	175	He	3588909	0.77	3597679	99.76	70	125	
Th	232	He	6522693	2.04	6454831	101.05	70	125	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICB
Data File Name	008_ICB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:20:41-07:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	No Gas	0.001	193.8	23	28.5	0.04	
V	51	He	0.008	119.3	172	20.5	0.4	
Cr	52	He	-0.005	-98.0	426	6.7	0.4	
Cr	53	He	0.033	323.8	121	55.3	0.4	
Mn	55	He	-0.001	-804.0	36	30.1	0.1	
Co	59	He	-0.001	-135.2	67	13.2	0.04	
Ni	60	He	-0.026	-59.1	244	16.5	0.4	
Ni	62	He	-0.025	-151.5	47	32.7	0.4	
Cu	63	He	0.000	8917.1	923	10.1	0.2	
Cu	65	He	-0.008	-37.6	431	1.8	0.2	
Zn	66	He	-0.032	-235.8	857	7.4	1	
As	75	He	-0.001	-2787.9	11	82.0	1	
Se	77	H2	-0.011	-1378.8	1138	2.7	20	
Se	78	H2	0.013	47.7	17	30.8	2	
Mo	95	He	0.005	58.2	26	39.8	0.1	
Mo	97	He	0.005	84.4	19	53.9	0.1	
Mo	98	He	0.006	11.1	52	7.4	0.1	
Ag	107	He	0.002	49.8	37	39.6	0.04	
Ag	109	He	0.002	50.8	44	35.4	0.04	
Cd	111	He	0.004	8.5	12	4.3	0.04	
Cd	114	He	0.005	36.8	35	19.8	0.04	
Sb	121	He	0.009	108.8	234	15.9	0.2	
Sb	123	He	0.005	47.4	179	4.4	0.1	
Ba	135	He	0.003	465.3	26	39.8	0.1	
Ba	137	He	0.000	-766.7	28	17.6	0.1	
Tl	203	He	0.031	18.2	467	14.8	0.04	
Tl	205	He	0.034	18.7	1289	14.9	0.04	
[Pb]	206	He	0.000	2111.5	189	18.0	0.1	
[Pb]	207	He	-0.003	-54.0	163	5.4	0.1	
Pb	208	He	-0.003	-15.8	758	3.7	0.1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6719080	1.75	6622263	101.46	70	125	
Ge	72	He	136645	0.93	136097	100.40	70	125	
Ge	72	H2	1282927	1.89	1259132	101.89	70	125	
In	115	He	1348526	1.15	1344886	100.27	70	125	
Lu	175	He	3559289	2.82	3597679	98.93	70	125	
Th	232	He	6548605	0.82	6454831	101.45	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	009_CCB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:24:26-07:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	No Gas	-0.001	-145.9	15	46.7	0.04	
V	51	He	-0.003	-360.8	133	30.3	0.4	
Cr	52	He	-0.004	-152.1	439	7.1	0.4	
Cr	53	He	-0.012	-68.5	94	5.4	0.4	
Mn	55	He	0.002	322.8	42	37.3	0.1	
Co	59	He	0.000	315.4	79	17.1	0.04	
Ni	60	He	0.001	2786.6	319	16.7	0.4	
Ni	62	He	0.016	402.7	64	42.1	0.4	
Cu	63	He	-0.014	-106.8	831	13.5	0.2	
Cu	65	He	-0.032	-41.7	347	14.0	0.2	
Zn	66	He	0.022	155.8	921	4.1	1	
As	75	He	0.003	175.9	14	22.4	1	
Se	77	H2	-0.098	-62.8	1122	0.8	20	
Se	78	H2	0.007	113.4	12	58.3	2	
Mo	95	He	0.002	135.7	17	72.1	0.1	
Mo	97	He	0.004	115.6	17	69.3	0.1	
Mo	98	He	0.002	113.2	28	48.5	0.1	
Ag	107	He	0.002	32.5	39	26.2	0.04	
Ag	109	He	0.002	67.6	36	42.3	0.04	
Cd	111	He	0.003	35.6	10	18.0	0.04	
Cd	114	He	0.002	55.6	25	18.0	0.04	
Sb	121	He	0.002	278.9	209	11.6	0.2	
Sb	123	He	0.002	242.8	169	7.4	0.1	
Ba	135	He	-0.008	-117.4	18	39.0	0.1	
Ba	137	He	-0.001	-475.7	28	25.0	0.1	
Tl	203	He	0.009	15.7	186	10.5	0.04	
Tl	205	He	0.010	21.0	567	13.5	0.04	
[Pb]	206	He	0.001	272.4	198	8.0	0.1	
[Pb]	207	He	-0.004	-96.7	154	26.1	0.1	
Pb	208	He	-0.003	-54.1	760	10.6	0.1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6766535	0.11	6622263	102.18	70	125	
Ge	72	He	138659	0.60	136097	101.88	70	125	
Ge	72	H2	1289717	1.91	1259132	102.43	70	125	
In	115	He	1360365	0.60	1344886	101.15	70	125	
Lu	175	He	3661313	2.11	3597679	101.77	70	125	
Th	232	He	6552634	2.06	6454831	101.52	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLICVS
Data File Name	010LICV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:28:10-07:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	0.035	9.161	228	7.91	0.04	89	
V	51	He	0.365	4.257	1548	3.43	0.4	91	
Cr	52	He	0.372	4.469	2386	4.07	0.4	93	
Cr	53	He	0.405	0.881	361	1.07	0.4	101	
Mn	55	He	0.093	12.159	229	10.33	0.1	93	
Co	59	He	0.039	6.592	436	5.74	0.04	97	
Ni	60	He	0.351	10.061	1245	7.04	0.4	88	
Ni	62	He	0.280	9.244	174	6.71	0.4	70	
Cu	63	He	0.181	17.573	2322	10.12	0.2	90	
Cu	65	He	0.173	7.061	1127	4.65	0.2	87	
Zn	66	He	0.863	8.058	1720	3.68	1	86	
As	75	He	0.936	4.035	549	3.41	1	94	
Se	77	H2	1.678	21.339	1558	5.72	2	84	
Se	78	H2	1.915	3.127	1573	4.00	2	96	
Mo	95	He	0.084	13.001	324	12.39	0.1	84	
Mo	97	He	0.096	6.671	240	6.05	0.1	96	
Mo	98	He	0.096	3.999	626	4.14	0.1	96	
Ag	107	He	0.041	10.719	554	10.79	0.04	103	
Ag	109	He	0.040	2.742	542	2.33	0.04	101	
Cd	111	He	0.036	10.626	61	9.83	0.04	89	
Cd	114	He	0.039	8.948	177	7.68	0.04	97	
Sb	121	He	0.101	8.343	615	5.41	0.1	101	
Sb	123	He	0.108	5.852	519	3.61	0.1	108	
Ba	135	He	0.094	11.824	92	9.10	0.1	94	
Ba	137	He	0.104	22.307	167	18.33	0.1	104	
Tl	203	He	0.046	2.806	689	0.74	0.04	116	
Tl	205	He	0.042	7.965	1625	7.73	0.04	106	
[Pb]	206	He	0.101	13.771	1223	10.72	0.1	101	
[Pb]	207	He	0.095	4.152	1042	1.95	0.1	95	
Pb	208	He	0.096	1.799	4877	2.18	0.1	96	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6655758	0.50	6622263	100.51	70	125	
Ge	72	He	139065	0.54	136097	102.18	70	125	
Ge	72	H2	1273662	2.19	1259132	101.15	70	125	
In	115	He	1365925	0.45	1344886	101.56	70	125	
Lu	175	He	3682471	1.78	3597679	102.36	70	125	
Th	232	He	6694174	0.74	6454831	103.71	70	125	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	011ICSA.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:31:54-07:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	QC Flag
Be	9	No Gas	0.015	19.0	106	12.5	
V	51	He	0.013	30.3	197	7.4	
Cr	52	He	0.198	11.5	1507	8.1	
Cr	53	He	0.181	42.2	221	22.2	
Mn	55	He	1.372	3.5	2915	3.6	
Co	59	He	0.232	2.4	2265	2.5	
Ni	60	He	0.335	7.5	1222	5.5	
Ni	62	He	0.348	12.8	206	8.9	
Cu	63	He	0.358	2.4	3736	1.6	
Cu	65	He	0.396	3.1	2003	2.2	
Zn	66	He	1.357	7.9	2221	4.5	
As	75	He	0.078	25.4	58	20.1	
Se	77	H2	1.304	20.4	1502	5.4	
Se	78	H2	0.045	11.1	43	10.4	
Mo	95	He	52.741	0.8	191330	0.8	
Mo	97	He	52.569	1.0	122963	1.7	
Mo	98	He	53.580	1.9	329846	1.6	
Ag	107	He	0.032	4.9	416	4.9	
Ag	109	He	0.029	10.9	386	10.7	
Cd	111	He	0.104	4.3	164	5.3	
Cd	114	He	0.100	1.8	412	2.4	
Sb	121	He	0.253	6.4	1193	4.8	
Sb	123	He	0.250	4.4	954	2.7	
Ba	135	He	0.196	10.4	161	7.8	
Ba	137	He	0.177	11.3	256	9.8	
Tl	203	He	0.016	7.5	272	3.9	
Tl	205	He	0.014	7.3	682	3.2	
[Pb]	206	He	0.098	5.9	1163	6.7	
[Pb]	207	He	0.092	14.2	994	10.4	
Pb	208	He	0.093	4.7	4627	3.0	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6666458	3.48	6622263	100.67	70	125	
Ge	72	He	141111	0.20	136097	103.68	70	125	
Ge	72	H2	1307598	2.20	1259132	103.85	70	125	
In	115	He	1319661	1.19	1344886	98.12	70	125	
Lu	175	He	3592355	1.71	3597679	99.85	70	125	
Th	232	He	6592696	1.35	6454831	102.14	70	125	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	012ICSB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:35:38-07:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	0.017	8.227	123	9.89	-1	-1.7	
V	51	He	50.303	0.955	198674	0.88	50	100.6	
Cr	52	He	50.502	0.898	268760	0.92	50	101.0	
Cr	53	He	50.962	2.777	33528	2.02	50	101.9	
Mn	55	He	51.299	1.415	108860	0.49	50	102.6	
Co	59	He	48.107	1.341	459167	0.99	50	96.2	
Ni	60	He	48.008	1.404	130622	0.50	50	96.0	
Ni	62	He	46.738	1.962	20001	1.77	50	93.5	
Cu	63	He	47.064	0.956	370982	0.63	50	94.1	
Cu	65	He	46.951	2.086	183504	1.16	50	93.9	
Zn	66	He	24.475	2.534	24742	1.75	25	97.9	
As	75	He	25.067	2.415	14782	1.74	25	100.3	
Se	77	H2	25.487	3.159	7834	1.05	25	101.9	
Se	78	H2	24.069	1.649	20329	1.23	25	96.3	
Mo	95	He	52.792	1.063	194537	0.17	50	105.6	
Mo	97	He	53.194	1.613	126380	0.70	50	106.4	
Mo	98	He	54.356	1.094	339918	0.50	50	108.7	
Ag	107	He	12.566	0.537	162885	0.46	12.5	100.5	
Ag	109	He	12.313	0.740	158609	0.27	12.5	98.5	
Cd	111	He	25.308	1.118	39260	0.21	25	101.2	
Cd	114	He	24.727	1.160	99540	0.44	25	98.9	
Sb	121	He	0.277	7.178	1308	5.16	-1	-27.7	
Sb	123	He	0.265	7.754	1018	6.18	-1	-26.5	
Ba	135	He	0.151	29.768	131	24.03	-1	-15.1	
Ba	137	He	0.208	2.830	300	3.33	-1	-20.8	
Tl	203	He	0.013	30.986	241	22.05	-1	-1.3	
Tl	205	He	0.011	22.005	603	12.99	-1	-1.1	
[Pb]	206	He	0.094	7.406	1153	5.41	-1	-9.4	
[Pb]	207	He	0.093	8.764	1031	7.82	-1	-9.3	
Pb	208	He	0.093	3.543	4730	2.38	-1	-9.3	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6955807	2.99	6622263	105.04	70	125	
Ge	72	He	142765	0.94	136097	104.90	70	125	
Ge	72	H2	1314829	2.79	1259132	104.42	70	125	
In	115	He	1340529	0.99	1344886	99.68	70	125	
Lu	175	He	3674649	0.86	3597679	102.14	70	125	
Th	232	He	6671337	1.87	6454831	103.35	70	125	

Prep Blank (PB) Report

Sample Table

Sample Name	KQ1503665-02
Data File Name	013_PB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:39:23-07:00
Sample Type	PB
Dilution	1
Comment	5 Rerun
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	No Gas	-0.002	-13.5	11	14.3	0.04	
V	51	He	0.011	156.4	192	34.1	0.4	
Cr	52	He	0.046	28.7	720	9.3	0.4	
Cr	53	He	0.007	541.6	110	23.7	0.4	
Mn	55	He	0.026	4.6	93	3.6	0.1	
Co	59	He	0.000	259.9	81	12.6	0.04	
Ni	60	He	0.096	29.2	588	12.5	0.4	
Ni	62	He	0.125	36.0	113	17.9	0.4	
Cu	63	He	0.138	11.7	2053	6.7	0.2	
Cu	65	He	0.131	8.4	994	3.6	0.2	
Zn	66	He	0.233	40.5	1157	7.6	1	
As	75	He	0.006	55.4	16	12.5	1	
Se	77	H2	-0.122	-107.1	1133	3.3	2	
Se	78	H2	0.012	46.5	16	31.4	2	
Mo	95	He	0.008	56.7	40	46.4	0.1	
Mo	97	He	0.013	39.7	40	33.3	0.1	
Mo	98	He	0.012	10.9	92	10.4	0.1	
Ag	107	He	0.005	26.8	71	23.6	0.04	
Ag	109	He	0.005	50.3	84	38.3	0.04	
Cd	111	He	0.005	18.7	13	8.2	0.04	
Cd	114	He	0.119	5.1	519	1.3	0.04	Flag
Sb	121	He	-0.011	-74.5	162	18.0	0.1	
Sb	123	He	-0.014	-17.1	121	9.2	0.1	
Ba	135	He	-0.015	-83.2	13	66.2	0.1	
Ba	137	He	0.001	372.6	31	8.2	0.1	
Tl	203	He	0.002	83.4	99	21.9	0.04	
Tl	205	He	0.000	-555.6	241	15.2	0.04	
[Pb]	206	He	0.020	41.6	409	22.3	0.1	
[Pb]	207	He	0.013	15.9	320	7.2	0.1	
Pb	208	He	0.013	20.5	1478	8.8	0.1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	7019849	2.25	6622263	106.00	70	125	
Ge	72	He	143178	0.85	136097	105.20	70	125	
Ge	72	H2	1310501	2.20	1259132	104.08	70	125	
In	115	He	1410042	3.51	1344886	104.84	70	125	
Lu	175	He	3754116	1.97	3597679	104.35	70	125	
Th	232	He	6747988	1.89	6454831	104.54	70	125	

Sample Report

Sample Table

Sample Name	K1503503-001A
Data File Name	014SMPL.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:43:07-07:00
Sample Type	Sample
Dilution	1
Comment	5 +200ppb
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	185.155	1.31	1238111	0.01	
V	51	He	332.167	0.99	1305826	0.03	
Cr	52	He	419.877	2.01	2221900	0.02	
Cr	53	He	401.370	0.77	262323	0.15	
Mn	55	He	3372.082	1.80	7124334	0.05	>LDR
Co	59	He	246.691	2.51	2344542	0.01	
Ni	60	He	327.452	1.82	885423	0.04	
Ni	62	He	325.429	2.00	138337	0.24	
Cu	63	He	552.189	2.79	4324002	0.01	
Cu	65	He	574.850	1.42	2232632	0.03	
Zn	66	He	5116.408	2.14	4959468	0.10	>LDR
As	75	He	230.798	2.30	135441	0.17	
Se	77	H2	211.816	2.53	55417	0.38	
Se	78	H2	204.579	2.04	169234	0.12	
Mo	95	He	213.281	1.31	826278	0.03	
Mo	97	He	216.490	0.90	540784	0.04	
Mo	98	He	215.691	0.80	1418109	0.02	
Ag	107	He	4.348	0.43	59262	0.01	
Ag	109	He	4.284	0.99	58029	0.01	
Cd	111	He	231.005	1.21	376716	0.06	
Cd	114	He	228.920	0.77	968767	0.02	
Sb	121	He	206.306	0.39	868860	0.02	
Sb	123	He	206.028	1.56	700796	0.03	
Ba	135	He	866.242	1.17	651645	0.13	
Ba	137	He	863.495	0.61	1181145	0.07	
Tl	203	He	190.503	1.95	2548316	0.01	
Tl	205	He	189.319	0.93	6222273	0.00	
[Pb]	206	He	559.960	0.25	5780050	0.01	
[Pb]	207	He	556.857	0.31	5049172	0.01	
Pb	208	He	551.047	0.94	22969608	0.00	

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QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	7564802	0.71	6622263	114.23	70	125	
Ge	72	He	142203	1.83	136097	104.49	70	125	
Ge	72	H2	1287910	1.47	1259132	102.29	70	125	
In	115	He	1409416	1.18	1344886	104.80	70	125	
Lu	175	He	3716196	0.42	3597679	103.29	70	125	
Th	232	He	6846411	0.14	6454831	106.07	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	015_CCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:50:57-07:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	24.542	3.883	149815	1.07	25	98	
V	51	He	24.735	1.802	97658	0.92	25	99	
Cr	52	He	24.987	1.314	133073	1.08	25	100	
Cr	53	He	24.912	3.652	16430	4.00	25	100	
Mn	55	He	24.972	1.458	52967	2.33	25	100	
Co	59	He	24.742	1.151	235952	1.08	25	99	
Ni	60	He	24.975	0.472	68045	1.13	25	100	
Ni	62	He	24.421	2.205	10468	1.54	25	98	
Cu	63	He	24.803	1.862	195751	1.02	25	99	
Cu	65	He	24.980	1.053	97762	0.21	25	100	
Zn	66	He	25.342	0.280	25564	1.13	25	101	
As	75	He	25.390	1.139	14958	1.43	25	102	
Se	77	H2	25.248	4.172	7884	1.73	25	101	
Se	78	H2	23.959	2.645	20528	1.15	25	96	
Mo	95	He	24.877	1.068	95408	1.51	25	100	
Mo	97	He	25.406	1.166	62820	1.11	25	102	
Mo	98	He	25.260	1.056	164405	1.50	25	101	
Ag	107	He	25.366	0.309	342164	0.57	25	101	
Ag	109	He	25.251	0.721	338453	0.47	25	101	
Cd	111	He	25.156	0.964	40611	0.69	25	101	
Cd	114	He	24.789	0.708	103848	0.33	25	99	
Sb	121	He	25.144	0.263	104990	0.32	25	101	
Sb	123	He	25.562	0.357	86212	0.27	25	102	
Ba	135	He	25.229	4.218	18807	3.73	25	101	
Ba	137	He	24.939	0.150	33793	0.48	25	100	
Tl	203	He	25.292	2.384	332430	0.72	25	101	
Tl	205	He	25.102	2.327	810700	0.16	25	100	
[Pb]	206	He	25.799	1.778	261830	0.84	25	103	
[Pb]	207	He	25.585	2.592	228080	0.46	25	102	
Pb	208	He	25.690	2.298	1052876	0.07	25	103	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6911188	3.70	6622263	104.36	70	125	
Ge	72	He	142617	0.89	136097	104.79	70	125	
Ge	72	H2	1333752	1.79	1259132	105.93	70	125	
In	115	He	1394957	0.49	1344886	103.72	70	125	
Lu	175	He	3652262	2.38	3597679	101.52	70	125	
Th	232	He	6636198	0.71	6454831	102.81	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	016_CCB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:54:42-07:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	No Gas	0.001	104.0	26	20.0	0.04	
V	51	He	0.001	362.6	152	10.8	0.4	
Cr	52	He	0.000	-4669.9	467	15.6	0.4	
Cr	53	He	0.010	518.9	110	29.2	0.4	
Mn	55	He	0.040	50.8	122	34.8	0.1	
Co	59	He	-0.001	-264.8	71	19.0	0.04	
Ni	60	He	-0.060	-28.3	161	28.2	0.4	
Ni	62	He	-0.050	-52.5	38	28.4	0.4	
Cu	63	He	-0.024	-31.9	768	7.1	0.2	
Cu	65	He	-0.018	-121.1	406	20.4	0.2	
Zn	66	He	-0.035	-311.4	882	11.7	1	
As	75	He	0.007	191.7	16	49.5	1	
Se	77	H2	-0.113	-112.0	1132	3.6	20	
Se	78	H2	0.011	27.1	15	15.1	2	
Mo	95	He	0.007	34.7	33	26.5	0.1	
Mo	97	He	0.011	39.6	34	31.1	0.1	
Mo	98	He	0.008	21.0	66	16.3	0.1	
Ag	107	He	0.003	22.5	47	18.9	0.04	
Ag	109	He	0.001	109.2	32	62.4	0.04	
Cd	111	He	0.007	29.0	16	20.1	0.04	
Cd	114	He	0.008	19.6	50	12.5	0.04	
Sb	121	He	-0.010	-5.8	162	2.1	0.2	
Sb	123	He	-0.008	-86.2	139	16.1	0.1	
Ba	135	He	0.002	1059.0	26	65.7	0.1	
Ba	137	He	0.001	1046.9	31	32.9	0.1	
Tl	203	He	0.038	19.5	574	18.1	0.04	
Tl	205	He	0.030	7.8	1218	5.0	0.04	
[Pb]	206	He	0.005	92.8	240	19.3	0.1	
[Pb]	207	He	0.003	183.6	213	18.0	0.1	
Pb	208	He	0.002	137.1	977	11.7	0.1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6966091	3.62	6622263	105.19	70	125	
Ge	72	He	141207	0.63	136097	103.75	70	125	
Ge	72	H2	1305624	2.82	1259132	103.69	70	125	
In	115	He	1381078	0.67	1344886	102.69	70	125	
Lu	175	He	3643731	1.56	3597679	101.28	70	125	
Th	232	He	6498181	0.28	6454831	100.67	70	125	

Low Level Continuing Calibration Verification (LLCCV) Report

Sample Table

Sample Name	LLCCVS
Data File Name	017LCCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T10:58:26-07:00
Sample Type	LLCCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

Wrong Spot
ICV
MMK
4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	2.576	3.385	16029	1.44	0.04	6441	LLCCV Failed
V	51	He	26.033	0.623	101691	1.06	0.4	6508	LLCCV Failed
Cr	52	He	10.664	1.702	56458	1.93	0.4	2666	LLCCV Failed
Cr	53	He	10.657	2.930	7014	3.94	0.4	2664	LLCCV Failed
Mn	55	He	26.030	1.260	54614	0.99	0.1	26030	LLCCV Failed
Co	59	He	26.216	1.205	247342	1.15	0.04	65540	LLCCV Failed
Ni	60	He	26.429	2.229	71208	0.83	0.4	6607	LLCCV Failed
Ni	62	He	25.956	3.524	11001	2.17	0.4	6489	LLCCV Failed
Cu	63	He	13.282	0.573	104160	1.24	0.2	6641	LLCCV Failed
Cu	65	He	13.089	1.419	50911	1.82	0.2	6545	LLCCV Failed
Zn	66	He	25.794	2.343	25723	1.62	1	2579	LLCCV Failed
As	75	He	26.408	1.120	15391	1.12	1	2641	LLCCV Failed
Se	77	H2	26.863	1.735	8148	0.66	2	1343	LLCCV Failed
Se	78	H2	25.782	2.787	21649	1.88	2	1289	LLCCV Failed
Mo	95	He	25.900	1.181	99356	0.86	0.1	25900	LLCCV Failed
Mo	97	He	26.468	0.953	65467	0.98	0.1	26468	LLCCV Failed
Mo	98	He	26.376	0.976	171711	0.62	0.1	26376	LLCCV Failed
Ag	107	He	13.355	0.376	180208	0.21	0.04	33387	LLCCV Failed
Ag	109	He	13.155	0.863	176393	1.04	0.04	32887	LLCCV Failed
Cd	111	He	13.395	0.840	21634	0.48	0.04	33487	LLCCV Failed
Cd	114	He	13.418	0.733	56238	0.49	0.04	33545	LLCCV Failed
Sb	121	He	25.259	0.433	105505	0.38	0.1	25259	LLCCV Failed
Sb	123	He	25.585	1.870	86318	1.74	0.1	25585	LLCCV Failed
Ba	135	He	104.983	1.173	78217	0.89	0.1	104983	LLCCV Failed
Ba	137	He	105.352	0.051	142710	0.41	0.1	105352	LLCCV Failed
Tl	203	He	26.171	0.407	345444	0.37	0.04	65429	LLCCV Failed
Tl	205	He	26.214	2.327	850159	1.89	0.04	65535	LLCCV Failed
[Pb]	206	He	26.550	2.490	270543	2.04	0.1	26550	LLCCV Failed
[Pb]	207	He	27.560	1.962	246710	1.39	0.1	27560	LLCCV Failed
Pb	208	He	26.811	1.360	1103429	0.88	0.1	26811	LLCCV Failed

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	7032465	1.91	6622263	106.19	70	125	
Ge	72	He	141105	1.54	136097	103.68	70	125	
Ge	72	H2	1307013	1.03	1259132	103.80	70	125	
In	115	He	1395421	0.37	1344886	103.76	70	125	
Lu	175	He	3666448	0.61	3597679	101.91	70	125	
Th	232	He	6586504	1.71	6454831	102.04	70	125	

Low Level Continuing Calibration Verification (LLCCV) Report

Sample Table

Sample Name	LLCCVS
Data File Name	019LCCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:05:25-07:00
Sample Type	LLCCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

Rerun [illegible] 4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	0.038	6.988	256	4.35	0.04	94	
V	51	He	0.384	2.552	1645	3.68	0.4	96	
Cr	52	He	0.385	9.698	2482	6.74	0.4	96	
Cr	53	He	0.388	24.048	354	16.57	0.4	97	
Mn	55	He	0.102	15.039	252	11.55	0.1	102	
Co	59	He	0.034	27.481	396	22.94	0.04	85	
Ni	60	He	0.327	5.606	1198	2.79	0.4	82	
Ni	62	He	0.338	24.206	201	17.72	0.4	84	
Cu	63	He	0.169	4.167	2261	1.62	0.2	84	
Cu	65	He	0.182	11.596	1174	8.68	0.2	91	
Zn	66	He	0.798	12.802	1680	4.77	1	80	
As	75	He	0.910	5.561	541	4.35	1	91	
Se	77	H2	1.875	21.423	1635	5.06	2	94	
Se	78	H2	1.903	3.716	1590	2.43	2	95	
Mo	95	He	0.111	1.749	436	2.34	0.1	111	
Mo	97	He	0.099	10.876	253	10.44	0.1	99	
Mo	98	He	0.116	8.337	774	7.70	0.1	116	
Ag	107	He	0.045	6.810	618	7.35	0.04	113	
Ag	109	He	0.042	12.992	578	12.54	0.04	105	
Cd	111	He	0.038	5.408	66	4.30	0.04	94	
Cd	114	He	0.042	2.358	193	2.01	0.04	104	
Sb	121	He	0.096	5.571	608	3.95	0.1	96	
Sb	123	He	0.097	19.408	495	12.63	0.1	97	
Ba	135	He	0.079	13.866	83	10.58	0.1	79	
Ba	137	He	0.094	5.287	157	3.72	0.1	94	
Tl	203	He	0.082	3.888	1171	4.03	0.04	204	LLCCV Failed
Tl	205	He	0.075	12.824	2716	11.33	0.04	187	LLCCV Failed
[Pb]	206	He	0.101	9.928	1238	9.04	0.1	101	
[Pb]	207	He	0.094	8.129	1050	6.06	0.1	94	
Pb	208	He	0.096	2.916	4933	3.05	0.1	96	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	7074839	2.30	6622263	106.83	70	125	
Ge	72	He	140910	1.34	136097	103.54	70	125	
Ge	72	H2	1295831	1.27	1259132	102.91	70	125	
In	115	He	1400778	0.79	1344886	104.16	70	125	
Lu	175	He	3728263	0.70	3597679	103.63	70	125	
Th	232	He	6681578	0.57	6454831	103.51	70	125	

Low Level Continuing Calibration Verification (LLCCV) Report

Sample Table

Sample Name	LLCCVS
Data File Name	020LCCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:12:16-07:00
Sample Type	LLCCV
Dilution	1
Comment	Rerun
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	0.035	14.747	236	12.77	0.04	88	
V	51	He	0.367	10.413	1546	8.72	0.4	92	
Cr	52	He	0.388	2.690	2455	1.72	0.4	97	
Cr	53	He	0.344	14.230	320	9.02	0.4	86	
Mn	55	He	0.089	46.199	219	37.84	0.1	89	
Co	59	He	0.036	18.786	408	14.83	0.04	90	
Ni	60	He	0.331	16.486	1186	11.59	0.4	83	
Ni	62	He	0.323	51.617	191	36.69	0.4	81	
Cu	63	He	0.178	12.023	2288	7.87	0.2	89	
Cu	65	He	0.164	6.797	1087	3.42	0.2	82	
Zn	66	He	0.822	8.105	1671	3.10	1	82	
As	75	He	0.921	5.482	537	5.36	1	92	
Se	77	H2	1.758	13.043	1587	3.53	2	88	
Se	78	H2	1.829	3.371	1511	2.25	2	91	
Mo	95	He	0.100	4.710	387	4.80	0.1	100	
Mo	97	He	0.089	13.748	224	12.63	0.1	89	
Mo	98	He	0.091	9.656	606	9.79	0.1	91	
Ag	107	He	0.037	14.490	501	14.79	0.04	92	
Ag	109	He	0.041	1.080	562	0.34	0.04	103	
Cd	111	He	0.039	11.902	67	10.54	0.04	97	
Cd	114	He	0.040	8.979	183	8.74	0.04	100	
Sb	121	He	0.071	17.204	499	10.10	0.1	71	
Sb	123	He	0.079	14.915	431	8.85	0.1	79	
Ba	135	He	0.082	50.681	84	35.60	0.1	82	
Ba	137	He	0.093	8.563	154	7.19	0.1	93	
Tl	203	He	0.048	6.412	718	7.99	0.04	120	
Tl	205	He	0.042	2.100	1638	2.75	0.04	106	
[Pb]	206	He	0.090	9.579	1124	5.86	0.1	90	
[Pb]	207	He	0.104	5.470	1139	2.08	0.1	104	
Pb	208	He	0.094	5.576	4815	1.90	0.1	94	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6910338	1.79	6622263	104.35	70	125	
Ge	72	He	138202	0.77	136097	101.55	70	125	
Ge	72	H2	1281307	1.40	1259132	101.76	70	125	
In	115	He	1383281	0.80	1344886	102.85	70	125	
Lu	175	He	3717904	2.58	3597679	103.34	70	125	
Th	232	He	6611016	1.73	6454831	102.42	70	125	

Prep Blank (PB) Report

Sample Table

Sample Name	KQ1503409-02
Data File Name	021_PB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:16:05-07:00
Sample Type	PB
Dilution	1
Comment	5
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	No Gas	-0.001	-78.3	15	26.7	0.04	
V	51	He	0.000	9762.0	147	31.2	0.4	
Cr	52	He	0.044	43.5	696	14.3	0.4	
Cr	53	He	0.045	59.6	132	13.9	0.4	
Mn	55	He	0.005	59.6	49	14.2	0.1	
Co	59	He	-0.002	-145.8	53	60.3	0.04	
Ni	60	He	-0.047	-8.7	196	5.5	0.4	
Ni	62	He	-0.078	-29.9	26	37.7	0.4	
Cu	63	He	-0.011	-12.2	863	1.7	0.2	
Cu	65	He	-0.024	-40.8	382	9.1	0.2	
Zn	66	He	0.180	58.5	1081	9.9	1	
~~As~~	~~75~~	~~He~~	~~15.343~~	~~1.2~~	~~8883~~	~~1.9~~	~~1~~	~~Flag~~
Se	77	H2	-0.131	-44.3	1105	2.4	2	
Se	78	H2	0.009	85.8	13	49.9	2	
Mo	95	He	0.006	61.2	30	44.4	0.1	
Mo	97	He	0.009	31.3	29	24.0	0.1	
Mo	98	He	0.007	35.2	62	26.4	0.1	
Ag	107	He	0.004	26.0	61	22.7	0.04	
Ag	109	He	0.004	22.9	68	18.6	0.04	
Cd	111	He	0.001	94.7	7	22.4	0.04	
Cd	114	He	0.108	3.3	469	2.8	0.04	Flag
Sb	121	He	-0.007	-52.8	176	9.3	0.1	
Sb	123	He	0.001	422.9	171	6.7	0.1	
Ba	135	He	0.002	1147.1	26	60.2	0.1	
Ba	137	He	-0.002	-221.4	27	27.3	0.1	
Tl	203	He	0.006	13.7	148	8.5	0.04	
Tl	205	He	0.004	20.7	388	8.7	0.04	
[Pb]	206	He	0.009	43.4	289	12.3	0.1	
[Pb]	207	He	0.002	172.8	216	17.0	0.1	
Pb	208	He	0.004	34.6	1059	3.5	0.1	

Report from ICP MMR 4/17/15

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6869820	0.71	6622263	103.74	70	125	
Ge	72	He	140060	0.70	136097	102.91	70	125	
Ge	72	H2	1280428	1.34	1259132	101.69	70	125	
In	115	He	1398366	0.45	1344886	103.98	70	125	
Lu	175	He	3711531	1.74	3597679	103.16	70	125	
Th	232	He	6502454	0.74	6454831	100.74	70	125	

All Reference Sample Report

Sample Table

Sample Name	K1503521-001
Data File Name	022_ARF.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:19:50-07:00
Sample Type	AllRef
Dilution	1
Comment	500
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

See Y100 MMR 4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	-0.001	-135.40	15	-0.01	
V	51	He	0.047	9.02	337	0.01	
Cr	52	He	0.026	27.05	618	0.00	
Cr	53	He	0.027	353.87	123	0.02	
Mn	55	He	0.122	8.79	300	0.04	
Co	59	He	-0.003	-13.74	49	-0.01	
Ni	60	He	-0.074	-8.36	126	-0.06	
Ni	62	He	-0.057	-44.36	36	-0.16	
Cu	63	He	-0.012	-71.60	874	0.00	
Cu	65	He	-0.002	-413.41	479	0.00	
Zn	66	He	0.108	26.10	1040	0.01	
~~As~~	~~75~~	~~He~~	~~20797.004~~	~~0.64~~	~~12352535~~	~~0.17~~	~~AllRef Main CR1 Failed~~
Se	77	H2	14.353	3.31	4958	0.29	
Se	78	H2	0.060	32.82	57	0.11	
Mo	95	He	0.004	76.87	24	0.02	
Mo	97	He	0.003	101.20	14	0.02	
Mo	98	He	0.006	35.55	53	0.01	
Ag	107	He	0.002	65.33	33	0.01	
Ag	109	He	0.000	40.45	19	0.00	
Cd	111	He	0.002	72.53	8	0.02	
Cd	114	He	0.003	31.48	28	0.01	
Sb	121	He	23.016	1.12	96519	0.02	
Sb	123	He	22.656	1.50	76743	0.03	
Ba	135	He	0.082	38.33	63	0.08	
Ba	137	He	0.082	30.62	142	0.06	
Tl	203	He	0.002	58.86	103	0.00	
Tl	205	He	0.001	78.60	269	0.00	
[Pb]	206	He	0.041	5.97	610	0.01	
[Pb]	207	He	0.037	8.82	529	0.01	
Pb	208	He	0.039	2.61	2490	0.00	

NR MMR 4/17/15

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6663093	1.40	6622263	100.62	70	125	
Ge	72	He	143902	0.27	136097	105.74	70	125	
Ge	72	H2	1324136	1.38	1259132	105.16	70	125	
In	115	He	1400760	0.69	1344886	104.15	70	125	
Lu	175	He	3676647	0.78	3597679	102.19	70	125	
Th	232	He	6597009	0.81	6454831	102.20	70	125	

Sample Report

Sample Table

Sample Name	K1503521-001D
Data File Name	023SMPL.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:23:33-07:00
Sample Type	Sample
Dilution	1
Comment	500
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

See Y100 MMK 4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	-0.001	-65.55	15	-0.01	
V	51	He	0.066	14.44	409	0.02	
Cr	52	He	0.037	36.33	671	0.01	
Cr	53	He	0.043	48.89	133	0.03	
Mn	55	He	0.156	16.87	370	0.04	
Co	59	He	0.002	217.55	98	0.00	
Ni	60	He	-0.070	-13.63	137	-0.05	
Ni	62	He	-0.093	-22.03	20	-0.46	
Cu	63	He	0.009	10.01	1036	0.00	
Cu	65	He	0.007	125.64	508	0.00	
Zn	66	He	0.157	65.15	1080	0.01	
~~As~~	~~75~~	~~He~~	~~20751.441~~	~~2.29~~	~~12233266~~	~~0.17~~	~~>LDR~~
Se	77	H2	14.676	1.50	5052	0.29	
Se	78	H2	0.041	26.89	41	0.10	
Mo	95	He	0.003	155.53	18	0.01	
Mo	97	He	0.009	84.16	29	0.03	
Mo	98	He	0.004	13.61	43	0.01	
Ag	107	He	0.001	109.57	23	0.00	
Ag	109	He	0.000	101.76	19	0.00	
Cd	111	He	0.001	248.10	6	0.01	
Cd	114	He	0.001	283.53	19	0.00	
Sb	121	He	22.594	1.23	94729	0.02	
Sb	123	He	22.641	2.23	76674	0.03	
Ba	135	He	0.080	58.94	84	0.10	
Ba	137	He	0.101	17.39	167	0.06	
Tl	203	He	0.003	10.56	114	0.00	
Tl	205	He	0.001	99.72	278	0.00	
[Pb]	206	He	0.049	13.69	699	0.01	
[Pb]	207	He	0.042	6.98	570	0.01	
Pb	208	He	0.047	5.28	2827	0.00	

NR MMK 4/17/15

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6783000	1.78	6622263	102.43	70	125	
Ge	72	He	142843	0.86	136097	104.96	70	125	
Ge	72	H2	1326115	1.44	1259132	105.32	70	125	
In	115	He	1400476	0.97	1344886	104.13	70	125	
Lu	175	He	3687466	1.32	3597679	102.50	70	125	
Th	232	He	6584870	0.23	6454831	102.01	70	125	

Sample Report

Sample Table

Sample Name	K1503521-001L
Data File Name	024SMPL.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:27:15-07:00
Sample Type	Sample
Dilution	1
Comment	2500
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

see K320 mmk 4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	-0.001	-14.15	13	-0.01	
V	51	He	0.015	76.42	209	0.01	
Cr	52	He	0.001	639.38	482	0.00	
Cr	53	He	-0.025	-178.91	89	-0.03	
Mn	55	He	0.045	22.06	134	0.03	
Co	59	He	-0.002	-77.50	61	0.00	
Ni	60	He	-0.082	-6.92	104	-0.08	
Ni	62	He	-0.085	-32.88	23	-0.36	
Cu	63	He	-0.038	-38.25	668	-0.01	
Cu	65	He	-0.045	-24.75	308	-0.01	
Zn	66	He	-0.086	-73.25	846	-0.01	
~~As~~	~~75~~	~~He~~	~~4231.560~~	~~0.99~~	~~2501581~~	~~0.17~~	~~>LDR~~
Se	77	H2	2.826	5.91	1918	0.15	
Se	78	H2	0.013	45.07	17	0.08	
Mo	95	He	0.007	58.08	37	0.02	
Mo	97	He	0.005	110.92	20	0.03	
Mo	98	He	0.010	20.34	79	0.01	
Ag	107	He	0.002	30.23	31	0.01	
Ag	109	He	0.000	108.22	20	0.00	
Cd	111	He	0.001	106.50	6	0.01	
Cd	114	He	0.001	45.18	22	0.01	
Sb	121	He	4.541	0.95	19167	0.02	
Sb	123	He	4.488	0.99	15305	0.03	
Ba	135	He	0.030	128.61	47	0.06	
Ba	137	He	0.018	34.63	54	0.03	
Tl	203	He	0.001	186.27	92	0.00	
Tl	205	He	0.000	-2348.34	240	0.00	
[Pb]	206	He	0.005	56.91	243	0.00	
[Pb]	207	He	-0.002	-149.44	179	0.00	
Pb	208	He	0.001	229.97	941	0.00	

NR mmk 4/17/15

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	7010242	1.99	6622263	105.86	70	125	
Ge	72	He	143225	0.41	136097	105.24	70	125	
Ge	72	H2	1322047	2.73	1259132	105.00	70	125	
In	115	He	1397755	0.16	1344886	103.93	70	125	
Lu	175	He	3671682	0.44	3597679	102.06	70	125	
Th	232	He	6660923	0.92	6454831	103.19	70	125	

Post Digestion Spike Sample (PDS) Report

Sample Table

Sample Name	K1503521-001A
Data File Name	025_PDS.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:30:56-07:00
Sample Type	PDS
Dilution	1
Comment	500 +50ppb +10ppb Ag
QC Ref File Name	022_ARF.d
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

see 1100 MMR 4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Spk Amt	%Rec	QC Flag
Be	9	No Gas	49.304	1.785	305964	0.52	50	99	
V	51	He	50.102	1.403	197060	0.89	50	100	
Cr	52	He	51.730	1.201	274148	0.59	50	103	
Cr	53	He	52.150	1.736	34169	1.13	50	104	
Mn	55	He	50.387	0.512	106496	0.98	50	101	
Co	59	He	51.249	1.293	487140	0.89	50	103	
Ni	60	He	51.838	0.993	140447	1.03	50	104	
Ni	62	He	50.823	1.086	21686	1.57	50	102	
Cu	63	He	52.267	0.802	410213	1.07	50	105	
Cu	65	He	52.501	0.566	204322	0.86	50	105	
Zn	66	He	52.143	0.650	51459	0.81	50	104	
~~As~~	~~75~~	~~He~~	~~21007.534~~	~~1.016~~	~~12327470~~	~~0.42~~	~~50~~	~~421~~	~~Flag~~
Se	77	H2	63.103	2.064	17936	2.04	50	97	
Se	78	H2	48.075	1.343	41200	0.59	50	96	
Mo	95	He	49.249	0.866	189966	0.32	50	98	
Mo	97	He	50.008	1.340	124366	0.77	50	100	
Mo	98	He	49.813	0.492	326090	1.16	50	100	
Ag	107	He	10.344	1.104	140343	0.48	10	103	
Ag	109	He	10.362	1.075	139720	1.12	10	104	
Cd	111	He	52.282	0.928	84891	0.65	50	105	
Cd	114	He	51.931	0.192	218815	0.60	50	104	
Sb	121	He	71.867	0.223	301465	0.63	50	98	
Sb	123	He	72.715	0.150	246379	0.65	50	100	
Ba	135	He	50.500	3.343	37842	2.75	50	101	
Ba	137	He	51.569	0.862	70255	0.36	50	103	
Tl	203	He	51.432	2.336	691386	0.22	50	103	
Tl	205	He	50.736	2.789	1675701	0.82	50	101	
[Pb]	206	He	51.242	2.466	531683	0.42	50	102	
[Pb]	207	He	53.103	1.427	484121	1.49	50	106	
Pb	208	He	52.093	1.987	2183074	1.20	50	104	

NR MMR 4/17/15

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	7020794	1.33	6622263	106.02	70	125	
Ge	72	He	142177	0.61	136097	104.47	70	125	
Ge	72	H2	1334026	1.54	1259132	105.95	70	125	
In	115	He	1403163	0.76	1344886	104.33	70	125	
Lu	175	He	3735626	2.16	3597679	103.83	70	125	
Th	232	He	6672301	0.59	6454831	103.37	70	125	

Sample Report

Sample Table

Sample Name	K1503521-001S
Data File Name	026SMPL.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:34:37-07:00
Sample Type	Sample
Dilution	1.
Comment	500
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

See 1100 [illegible] 4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	0.210	2.70	1304	0.02	
V	51	He	2.135	1.18	8524	0.03	
Cr	52	He	0.922	4.06	5340	0.02	
Cr	53	He	1.031	11.95	776	0.13	
Mn	55	He	2.262	4.95	4807	0.05	
Co	59	He	2.097	1.54	19967	0.01	
Ni	60	He	2.121	1.99	6047	0.04	
Ni	62	He	2.171	2.29	980	0.22	
Cu	63	He	1.093	2.87	9497	0.01	
Cu	65	He	1.056	7.93	4568	0.02	
Zn	66	He	2.250	8.10	3096	0.07	
As	75	He	21731.079	1.48	12729971	0.17	>LDR
Se	77	H2	16.896	1.02	5590	0.30	
Se	78	H2	2.120	3.43	1796	0.12	
Mo	95	He	2.029	0.61	7811	0.03	
Mo	97	He	2.091	3.42	5190	0.04	
Mo	98	He	2.129	2.37	13909	0.02	
Ag	107	He	0.223	1.66	3019	0.01	
Ag	109	He	0.222	4.55	2990	0.01	
Cd	111	He	0.227	7.01	373	0.06	
Cd	114	He	0.216	1.89	925	0.02	
Sb	121	He	26.337	0.79	110252	0.02	
Sb	123	He	26.392	1.72	89245	0.03	
Ba	135	He	4.323	5.25	3251	0.13	
Ba	137	He	4.418	1.85	6027	0.07	
Tl	203	He	2.162	1.97	29253	0.01	
Tl	205	He	2.115	2.82	70377	0.00	
[Pb]	206	He	2.161	3.20	22697	0.01	
[Pb]	207	He	2.229	2.42	20586	0.01	
Pb	208	He	2.185	1.60	92818	0.00	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6920214	0.96	6622263	104.50	70	125	
Ge	72	He	141919	1.72	136097	104.28	70	125	
Ge	72	H2	1314760	0.86	1259132	104.42	70	125	
In	115	He	1398610	0.43	1344886	103.99	70	125	
Lu	175	He	3750770	2.02	3597679	104.26	70	125	
Th	232	He	6610235	1.82	6454831	102.41	70	125	

Sample Report

Sample Table

Sample Name	RINSE
Data File Name	027SMPL.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:38:32-07:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	-0.001	-13.44	13	-0.01	
V	51	He	-0.002	-211.31	138	0.00	
Cr	52	He	0.012	20.75	517	0.00	
Cr	53	He	-0.040	-99.82	76	-0.05	
Mn	55	He	0.005	126.96	47	0.01	
Co	59	He	-0.004	-16.89	37	-0.01	
Ni	60	He	-0.075	-14.26	119	-0.06	
Ni	62	He	-0.072	-6.71	28	-0.26	
Cu	63	He	-0.031	-8.34	697	0.00	
Cu	65	He	-0.032	-53.06	343	-0.01	
Zn	66	He	-0.144	-66.87	757	-0.02	
As	75	He	3.055	3.44	1744	0.18	
Se	77	H2	-0.283	-24.24	1055	-0.03	
Se	78	H2	0.013	28.45	17	0.08	
Mo	95	He	0.001	234.32	12	0.01	
Mo	97	He	0.000	1089.65	8	0.01	
Mo	98	He	0.002	108.33	30	0.01	
Ag	107	He	0.001	38.82	17	0.00	
Ag	109	He	0.001	100.34	21	0.00	
Cd	111	He	0.001	152.94	6	0.01	
Cd	114	He	0.003	75.84	30	0.01	
Sb	121	He	-0.008	-32.82	169	0.00	
Sb	123	He	-0.010	-94.72	131	-0.01	
Ba	135	He	-0.014	-84.83	13	-0.11	
Ba	137	He	0.000	1768.52	30	0.00	
Tl	203	He	0.005	48.22	141	0.00	
Tl	205	He	0.002	74.57	314	0.00	
[Pb]	206	He	-0.002	-184.49	173	0.00	
[Pb]	207	He	-0.005	-51.87	153	0.00	
Pb	208	He	-0.006	-40.61	650	0.00	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6690007	3.16	6622263	101.02	70	125	
Ge	72	He	137450	0.95	136097	100.99	70	125	
Ge	72	H2	1266549	2.47	1259132	100.59	70	125	
In	115	He	1368717	0.62	1344886	101.77	70	125	
Lu	175	He	3693819	0.85	3597679	102.67	70	125	
Th	232	He	6608986	1.88	6454831	102.39	70	125	

Laboratory Control Sample (LCSS) Report

Sample Table

Sample Name	KQ1503409-01
Data File Name	028_QCS.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:42:18-07:00
Sample Type	QCS
Dilution	1
Comment	20
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	39.393	4.517	235159	0.17	36.15	109.0	
V	51	He	52.702	0.593	210517	0.41	48.8	108.0	
Cr	52	He	76.217	0.790	409995	0.69	68	112.1	
Cr	53	He	74.895	0.042	49792	0.21	68	110.1	
Mn	55	He	172.776	0.609	370756	0.42	161.5	107.0	
Co	59	He	69.869	0.328	674465	0.34	64	109.2	
Ni	60	He	83.799	0.404	230370	0.53	76.5	109.5	
Ni	62	He	83.232	1.722	35979	1.82	76.5	108.8	
Cu	63	He	54.557	0.829	434808	0.95	51	107.0	
Cu	65	He	54.623	0.395	215868	0.22	51	107.1	
Zn	66	He	85.931	0.887	85516	0.75	80.5	106.7	
~~As~~	~~75~~	~~He~~	~~61.359~~	~~0.342~~	~~36580~~	~~0.48~~	~~49.8~~	~~123.2~~	NR
Se	77	H2	86.087	2.725	24040	0.60	75	114.8	
Se	78	H2	83.122	1.920	71252	1.07	75	110.8	
Mo	95	He	72.728	1.220	273193	0.77	66.5	109.4	
Mo	97	He	73.358	1.179	177664	0.41	66.5	110.3	
Mo	98	He	74.525	1.531	475064	0.92	66.5	112.1	
Ag	107	He	23.653	0.681	312536	0.76	20.2	117.1	
Ag	109	He	23.667	1.164	310749	0.85	20.2	117.2	
Cd	111	He	102.476	0.964	162035	0.43	91	112.6	
Cd	114	He	100.955	0.882	414232	0.41	91	110.9	
Sb	121	He	35.871	0.619	146633	0.24	44.1	81.3	
Sb	123	He	36.075	0.709	119119	0.88	44.1	81.8	
Ba	135	He	179.486	0.243	130936	0.59	155	115.8	
Ba	137	He	180.386	1.223	239255	1.18	155	116.4	
Tl	203	He	104.121	0.967	1357010	0.49	87	119.7	
Tl	205	He	102.000	2.356	3266122	1.64	87	117.2	
[Pb]	206	He	69.008	2.327	694113	1.14	57.5	120.0	
[Pb]	207	He	66.764	2.134	589928	0.89	57.5	116.1	
Pb	208	He	67.659	2.072	2748344	0.71	57.5	117.7	

NR [illegible] 4/17/15

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6762017	4.71	6622263	102.11	70	125	
Ge	72	He	144390	0.19	136097	106.09	70	125	
Ge	72	H2	1334732	2.88	1259132	106.00	70	125	
In	115	He	1366481	0.80	1344886	101.61	70	125	
Lu	175	He	3621125	1.42	3597679	100.65	70	125	
Th	232	He	6650195	0.87	6454831	103.03	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	029_CCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:46:02-07:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	24.007	2.961	145177	1.03	25	96	
V	51	He	24.452	1.196	95541	1.26	25	98	
Cr	52	He	24.906	0.754	131269	1.46	25	100	
Cr	53	He	24.787	1.908	16178	2.67	25	99	
Mn	55	He	24.779	0.172	52004	1.01	25	99	
Co	59	He	24.703	1.079	233108	0.70	25	99	
Ni	60	He	24.990	1.141	67370	0.38	25	100	
Ni	62	He	24.987	2.718	10599	3.26	25	100	
Cu	63	He	24.911	1.777	194544	1.14	25	100	
Cu	65	He	24.908	2.562	96457	1.82	25	100	
Zn	66	He	24.481	1.575	24466	1.43	25	98	
As	75	He	26.510	1.805	15452	1.04	25	106	
Se	77	H2	24.938	3.165	7744	0.79	25	100	
Se	78	H2	24.419	1.103	20770	1.56	25	98	
Mo	95	He	25.215	1.013	95370	1.09	25	101	
Mo	97	He	25.456	1.880	62077	1.93	25	102	
Mo	98	He	25.840	1.415	165854	1.34	25	103	
Ag	107	He	25.467	0.485	338792	0.45	25	102	
Ag	109	He	25.388	0.596	335610	0.55	25	102	
Cd	111	He	25.507	0.121	40610	0.12	25	102	
Cd	114	He	25.276	0.178	104432	0.13	25	101	
Sb	121	He	25.628	0.247	105534	0.25	25	103	
Sb	123	He	25.707	0.909	85506	0.95	25	103	
Ba	135	He	24.916	1.224	18320	1.16	25	100	
Ba	137	He	25.614	0.352	34229	0.38	25	102	
Tl	203	He	25.186	1.159	329915	0.73	25	101	
Tl	205	He	25.179	0.826	810442	0.39	25	101	
[Pb]	206	He	25.413	0.270	257025	0.48	25	102	
[Pb]	207	He	25.338	0.841	225126	0.66	25	101	
Pb	208	He	25.447	0.395	1039439	0.22	25	102	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6842785	2.08	6622263	103.33	70	125	
Ge	72	He	141125	0.87	136097	103.69	70	125	
Ge	72	H2	1323764	1.87	1259132	105.13	70	125	
In	115	He	1375736	0.08	1344886	102.29	70	125	
Lu	175	He	3638657	0.45	3597679	101.14	70	125	
Th	232	He	6583835	1.61	6454831	102.00	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	030_CCB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:49:47-07:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

Rerun [illegible] 4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	No Gas	0.001	83.2	25	16.0	0.04	
V	51	He	-0.005	-96.4	130	13.6	0.4	
Cr	52	He	0.000	2355.5	473	5.1	0.4	
Cr	53	He	0.017	120.5	116	11.7	0.4	
Mn	55	He	0.002	237.7	43	26.6	0.1	
Co	59	He	0.000	3969.6	78	42.9	0.04	
Ni	60	He	-0.081	-14.1	106	28.5	0.4	
Ni	62	He	-0.084	-32.7	23	49.5	0.4	
Cu	63	He	-0.041	-23.1	643	12.6	0.2	
Cu	65	He	-0.052	-38.9	277	27.2	0.2	
Zn	66	He	-0.156	-17.9	773	2.6	1	
As	75	He	0.838	4.5	505	3.4	1	
Se	77	H2	0.029	107.3	1177	1.8	20	
Se	78	H2	0.015	9.2	18	6.3	2	
Mo	95	He	0.013	39.1	57	32.7	0.1	
Mo	97	He	0.002	118.5	11	45.8	0.1	
Mo	98	He	0.006	41.2	54	30.2	0.1	
Ag	107	He	0.003	21.2	46	18.4	0.04	
Ag	109	He	0.002	35.6	44	24.1	0.04	
Cd	111	He	0.007	4.5	16	3.6	0.04	
Cd	114	He	0.007	32.7	49	21.2	0.04	
Sb	121	He	-0.005	-196.6	187	20.2	0.2	
Sb	123	He	-0.010	-55.4	133	13.2	0.1	
Ba	135	He	0.006	151.8	29	24.0	0.1	
Ba	137	He	0.001	801.0	31	29.5	0.1	
Tl	203	He	0.039	13.7	597	11.2	0.04	
Tl	205	He	0.045	12.2	1738	8.6	0.04	CCB Failed
[Pb]	206	He	-0.004	-69.7	159	14.3	0.1	
[Pb]	207	He	-0.005	-81.4	150	25.0	0.1	
Pb	208	He	-0.005	-19.8	687	5.7	0.1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6936090	0.88	6622263	104.74	70	125	
Ge	72	He	142470	1.36	136097	104.68	70	125	
Ge	72	H2	1315079	1.07	1259132	104.44	70	125	
In	115	He	1397413	1.12	1344886	103.91	70	125	
Lu	175	He	3721171	2.13	3597679	103.43	70	125	
Th	232	He	6710068	2.43	6454831	103.95	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	031_CCB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T11:53:33-07:00
Sample Type	CCB
Dilution	1
Comment	Rerun
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	No Gas	0.000	-559.3	20	21.2	0.04	
V	51	He	0.005	239.0	167	26.0	0.4	
Cr	52	He	-0.001	-381.0	467	3.6	0.4	
Cr	53	He	-0.022	-186.7	90	30.3	0.4	
Mn	55	He	0.003	190.8	44	26.3	0.1	
Co	59	He	-0.002	-102.0	54	41.7	0.04	
Ni	60	He	-0.069	-1.9	139	2.8	0.4	
Ni	62	He	-0.058	-82.4	34	59.1	0.4	
Cu	63	He	-0.045	-17.2	607	10.2	0.2	
Cu	65	He	-0.045	-32.0	303	18.4	0.2	
Zn	66	He	-0.223	-25.1	707	7.6	1	
As	75	He	0.706	10.0	426	9.9	1	
Se	77	H2	-0.034	-552.5	1158	4.2	20	
Se	78	H2	0.012	74.6	16	44.8	2	
Mo	95	He	0.002	58.6	14	26.7	0.1	
Mo	97	He	0.004	67.1	17	40.0	0.1	
Mo	98	He	0.002	33.1	31	16.4	0.1	
Ag	107	He	0.001	140.9	18	78.1	0.04	
Ag	109	He	0.001	112.1	28	56.7	0.04	
Cd	111	He	0.003	39.2	10	20.1	0.04	
Cd	114	He	0.004	30.2	33	14.5	0.04	
Sb	121	He	-0.010	-35.8	162	8.7	0.2	
Sb	123	He	-0.012	-59.2	128	17.0	0.1	
Ba	135	He	-0.010	-79.7	17	34.6	0.1	
Ba	137	He	0.007	63.5	39	15.1	0.1	
Tl	203	He	0.022	17.1	366	12.6	0.04	
Tl	205	He	0.014	9.9	721	6.8	0.04	
[Pb]	206	He	-0.003	-108.9	163	21.2	0.1	
[Pb]	207	He	-0.006	-14.6	142	6.8	0.1	
Pb	208	He	-0.007	-10.3	608	3.0	0.1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	7065760	4.27	6622263	106.70	70	125	
Ge	72	He	142130	0.21	136097	104.43	70	125	
Ge	72	H2	1312397	1.82	1259132	104.23	70	125	
In	115	He	1391302	0.76	1344886	103.45	70	125	
Lu	175	He	3763976	2.80	3597679	104.62	70	125	
Th	232	He	6587195	0.35	6454831	102.05	70	125	

Low Level Continuing Calibration Verification (LLCCV) Report

Sample Table

Sample Name	LLCCVS
Data File Name	033LCCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:00:19-07:00
Sample Type	LLCCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	0.034	1.657	228	3.07	0.04	86	
V	51	He	0.376	6.051	1591	6.11	0.4	94	
Cr	52	He	0.373	2.067	2392	2.82	0.4	93	
Cr	53	He	0.401	21.412	359	15.01	0.4	100	
Mn	55	He	0.090	16.627	223	14.24	0.1	90	
Co	59	He	0.036	10.158	411	7.31	0.04	90	
Ni	60	He	0.302	8.430	1117	4.99	0.4	75	
Ni	62	He	0.307	27.991	186	19.71	0.4	77	
Cu	63	He	0.152	8.171	2108	3.80	0.2	76	
Cu	65	He	0.147	22.668	1027	12.07	0.2	73	
Zn	66	He	0.703	26.375	1569	10.32	1	70	
As	75	He	1.454	3.450	847	4.37	1	145	LLCCV Failed
Se	77	H2	1.826	4.874	1600	1.19	2	91	
Se	78	H2	1.864	7.570	1534	5.80	2	93	
Mo	95	He	0.091	20.064	359	19.93	0.1	91	
Mo	97	He	0.109	1.346	278	1.83	0.1	109	
Mo	98	He	0.093	5.367	624	5.13	0.1	93	
Ag	107	He	0.040	8.374	548	8.74	0.04	100	
Ag	109	He	0.041	20.314	567	19.68	0.04	103	
Cd	111	He	0.041	11.296	72	9.87	0.04	103	
Cd	114	He	0.042	5.830	195	5.04	0.04	106	
Sb	121	He	0.084	2.023	556	1.65	0.1	84	
Sb	123	He	0.082	5.653	444	3.85	0.1	82	
Ba	135	He	0.082	8.021	86	5.95	0.1	82	
Ba	137	He	0.100	16.478	165	13.36	0.1	100	
Tl	203	He	0.045	12.402	668	9.68	0.04	113	
Tl	205	He	0.044	11.792	1649	8.11	0.04	109	
[Pb]	206	He	0.094	10.304	1148	10.65	0.1	94	
[Pb]	207	He	0.097	6.773	1062	4.28	0.1	97	
Pb	208	He	0.091	2.313	4617	3.99	0.1	91	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6852626	3.35	6622263	103.48	70	125	
Ge	72	He	139156	1.14	136097	102.25	70	125	
Ge	72	H2	1277486	1.68	1259132	101.46	70	125	
In	115	He	1396053	0.66	1344886	103.80	70	125	
Lu	175	He	3662422	2.20	3597679	101.80	70	125	
Th	232	He	6566773	1.03	6454831	101.73	70	125	

All Reference Sample Report

Sample Table

Sample Name	K1503521-001
Data File Name	034_ARF.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:29:34-07:00
Sample Type	AllRef
Dilution	1
Comment	100
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	0.000	-224.53	17	0.00	
V	51	He	0.236	12.88	1058	0.02	
Cr	52	He	0.112	22.92	1046	0.01	
Cr	53	He	0.153	34.32	201	0.08	
Mn	55	He	0.639	3.66	1365	0.05	
Co	59	He	0.019	19.85	252	0.01	
Ni	60	He	-0.016	-51.38	278	-0.01	
Ni	62	He	-0.054	-118.29	36	-0.15	
Cu	63	He	0.132	11.20	1961	0.01	
Cu	65	He	0.134	6.89	983	0.01	
Zn	66	He	1.239	9.40	2089	0.06	
~~As~~	~~75~~	~~He~~	~~106367.433~~	~~0.85~~	~~61373524~~	~~0.17~~	~~AllRef Main CR1 Failed~~
Se	77	H2	73.099	3.34	19941	0.37	
Se	78	H2	0.205	2.94	176	0.12	
Mo	95	He	0.014	38.51	61	0.02	
Mo	97	He	0.007	19.64	23	0.03	
Mo	98	He	0.009	26.60	72	0.01	
Ag	107	He	0.001	58.01	26	0.01	
Ag	109	He	0.001	35.53	24	0.00	
Cd	111	He	0.000	1516.39	5	0.00	
Cd	114	He	0.006	10.29	41	0.01	
Sb	121	He	114.431	0.46	477360	0.02	
Sb	123	He	114.512	0.56	385848	0.03	
Ba	135	He	0.426	29.64	341	0.12	
Ba	137	He	0.465	9.36	660	0.07	
Tl	203	He	0.002	38.78	103	0.00	
Tl	205	He	-0.001	-8.35	203	0.00	
[Pb]	206	He	0.197	5.50	2186	0.01	
[Pb]	207	He	0.179	5.58	1783	0.01	
Pb	208	He	0.182	3.23	8333	0.00	

NR
4/17/15

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6790067	1.36	6622263	102.53	70	125	
Ge	72	He	139805	1.49	136097	102.72	70	125	
Ge	72	H2	1292504	2.29	1259132	102.65	70	125	
In	115	He	1395752	0.46	1344886	103.78	70	125	
Lu	175	He	3641434	0.16	3597679	101.22	70	125	
Th	232	He	6524662	0.65	6454831	101.08	70	125	

Sample Report

Sample Table

Sample Name	K1503521-001D
Data File Name	035SMPL.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:33:15-07:00
Sample Type	Sample
Dilution	1
Comment	100
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	0.001	156.71	25	0.00	
V	51	He	0.306	13.23	1309	0.02	
Cr	52	He	0.169	9.57	1325	0.01	
Cr	53	He	0.114	18.55	173	0.07	
Mn	55	He	0.776	10.03	1626	0.05	
Co	59	He	0.026	30.03	313	0.01	
Ni	60	He	-0.019	-103.93	267	-0.01	
Ni	62	He	-0.007	-985.51	54	-0.01	
Cu	63	He	0.176	4.45	2262	0.01	
Cu	65	He	0.175	9.56	1122	0.02	
Zn	66	He	1.782	8.86	2567	0.07	
~~As~~	~~75~~	~~He~~	~~110211.363~~	~~0.71~~	~~62667127~~	~~0.18~~	~~>LDR~~
Se	77	H2	73.730	2.17	20008	0.37	
Se	78	H2	0.176	5.06	151	0.12	
Mo	95	He	0.015	53.17	67	0.02	
Mo	97	He	0.010	63.10	31	0.03	
Mo	98	He	0.014	33.21	104	0.01	
Ag	107	He	0.002	81.01	34	0.01	
Ag	109	He	0.001	155.02	22	0.00	
Cd	111	He	0.000	699.89	5	0.00	
Cd	114	He	0.004	27.21	35	0.01	
Sb	121	He	116.319	1.29	477896	0.02	
Sb	123	He	116.728	1.57	387360	0.03	
Ba	135	He	0.464	3.34	364	0.13	
Ba	137	He	0.525	2.23	730	0.07	
Tl	203	He	0.002	123.12	96	0.00	
Tl	205	He	0.000	160.23	247	0.00	
[Pb]	206	He	0.228	8.43	2509	0.01	
[Pb]	207	He	0.221	1.97	2164	0.01	
Pb	208	He	0.223	3.48	10031	0.00	

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QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6788229	0.96	6622263	102.51	70	125	
Ge	72	He	137756	0.76	136097	101.22	70	125	
Ge	72	H2	1285976	1.17	1259132	102.13	70	125	
In	115	He	1374813	1.43	1344886	102.23	70	125	
Lu	175	He	3659115	0.81	3597679	101.71	70	125	
Th	232	He	6532436	1.47	6454831	101.20	70	125	

Sample Report

Sample Table

Sample Name	K1503521-001L
Data File Name	036SMPL.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:36:56-07:00
Sample Type	Sample
Dilution	1
Comment	500
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	-0.001	-51.96	11	-0.01	
V	51	He	0.048	26.59	331	0.01	
Cr	52	He	0.016	49.09	547	0.00	
Cr	53	He	0.064	23.55	143	0.04	
Mn	55	He	0.139	16.40	324	0.04	
Co	59	He	0.000	1729.03	77	0.00	
Ni	60	He	-0.046	-38.50	198	-0.02	
Ni	62	He	-0.073	-16.57	28	-0.26	
Cu	63	He	-0.015	-44.20	828	0.00	
Cu	65	He	-0.009	-186.76	434	0.00	
Zn	66	He	0.046	226.54	949	0.00	
~~As~~	~~75~~	~~He~~	~~21586.194~~	~~0.67~~	~~12419110~~	~~0.17~~	~~>LDR~~
Se	77	H2	14.396	1.52	4868	0.30	
Se	78	H2	0.028	33.98	29	0.10	
Mo	95	He	0.004	74.81	22	0.02	
Mo	97	He	-0.001	-317.93	6	-0.01	
Mo	98	He	0.003	70.79	32	0.01	
Ag	107	He	0.001	90.91	24	0.01	
Ag	109	He	0.001	56.86	26	0.00	
Cd	111	He	-0.001	-82.35	4	-0.03	
Cd	114	He	0.001	214.01	20	0.00	
Sb	121	He	23.116	0.25	94930	0.02	
Sb	123	He	23.278	1.43	77216	0.03	
Ba	135	He	0.100	18.94	97	0.10	
Ba	137	He	0.084	6.62	141	0.06	
Tl	203	He	-0.001	-144.90	64	0.00	
Tl	205	He	-0.002	-33.17	168	0.00	
[Pb]	206	He	0.040	10.92	599	0.01	
[Pb]	207	He	0.030	16.91	464	0.01	
Pb	208	He	0.033	3.47	2273	0.00	

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QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6717198	1.28	6622263	101.43	70	125	
Ge	72	He	139389	0.55	136097	102.42	70	125	
Ge	72	H2	1296695	2.16	1259132	102.98	70	125	
In	115	He	1371734	0.54	1344886	102.00	70	125	
Lu	175	He	3675638	1.32	3597679	102.17	70	125	
Th	232	He	6637609	0.87	6454831	102.83	70	125	

Post Digestion Spike Sample (PDS) Report

Sample Table

Sample Name	K1503521-001A
Data File Name	037_PDS.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:40:36-07:00
Sample Type	PDS
Dilution	1
Comment	100 +50ppb +10ppb Ag
QC Ref File Name	034_ARF.d
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Spk Amt	%Rec	QC Flag
Be	9	No Gas	50.004	2.156	299069	0.43	50	100	
V	51	He	50.315	1.611	195233	0.74	50	100	
Cr	52	He	50.827	2.419	265725	1.45	50	101	
Cr	53	He	50.347	1.552	32548	1.17	50	100	
Mn	55	He	50.789	2.509	105892	1.98	50	100	
Co	59	He	51.247	1.464	480555	0.38	50	102	
Ni	60	He	51.502	1.377	137657	0.88	50	103	
Ni	62	He	52.064	1.984	21882	0.48	50	104	
Cu	63	He	52.235	2.210	404394	1.07	50	104	
Cu	65	He	52.609	2.329	201953	0.71	50	105	
Zn	66	He	52.874	1.584	51462	0.23	50	103	
~~As~~	~~75~~	~~He~~	~~106311.950~~	~~1.054~~	~~61549148~~	~~1.18~~	~~50~~	~~-111~~	~~Flag~~
Se	77	H2	123.251	1.660	33186	1.45	50	100	
Se	78	H2	48.656	1.681	40817	0.82	50	97	
Mo	95	He	49.490	0.673	189069	0.39	50	99	
Mo	97	He	49.662	0.944	122325	0.68	50	99	
Mo	98	He	50.265	0.484	325884	0.60	50	101	
Ag	107	He	10.358	0.733	139192	0.37	10	104	
Ag	109	He	10.309	0.531	137665	0.20	10	103	
Cd	111	He	52.723	1.284	84785	0.95	50	105	
Cd	114	He	51.975	0.556	216895	0.18	50	104	
Sb	121	He	165.619	0.906	687782	0.47	50	102	
Sb	123	He	165.864	0.577	556381	0.65	50	103	
Ba	135	He	51.991	1.388	38591	1.80	50	103	
Ba	137	He	52.039	0.534	70217	0.56	50	103	
Tl	203	He	51.928	2.133	682338	0.59	50	104	
Tl	205	He	52.834	3.871	1705564	2.41	50	106	
[Pb]	206	He	52.970	3.320	537183	1.78	50	106	
[Pb]	207	He	54.242	2.388	483285	1.22	50	108	
Pb	208	He	53.524	2.298	2192314	0.85	50	107	

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QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6767168	1.74	6622263	102.19	70	125	
Ge	72	He	140277	1.60	136097	103.07	70	125	
Ge	72	H2	1305829	1.06	1259132	103.71	70	125	
In	115	He	1389687	0.45	1344886	103.33	70	125	
Lu	175	He	3651173	1.56	3597679	101.49	70	125	
Th	232	He	6703126	1.34	6454831	103.85	70	125	

Sample Report

Sample Table

Sample Name	K1503521-001S
Data File Name	038SMPL.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:44:16-07:00
Sample Type	Sample
Dilution	1
Comment	100
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	1.037	1.50	6228	0.02	
V	51	He	10.572	1.63	41281	0.03	
Cr	52	He	4.272	2.89	22836	0.02	
Cr	53	He	4.100	10.87	2754	0.15	
Mn	55	He	11.049	1.56	23150	0.05	
Co	59	He	10.532	1.06	99167	0.01	
Ni	60	He	10.600	2.22	28682	0.04	
Ni	62	He	10.593	5.98	4513	0.23	
Cu	63	He	5.512	2.35	43672	0.01	
Cu	65	He	5.474	0.29	21516	0.03	
Zn	66	He	11.957	2.94	12385	0.10	
As	75	He	108249.629	1.04	62893705	0.17	>LDR
Se	77	H2	83.730	1.61	22995	0.36	
Se	78	H2	10.403	2.90	8761	0.12	
Mo	95	He	10.176	1.56	38728	0.03	
Mo	97	He	10.288	0.88	25244	0.04	
Mo	98	He	10.492	1.13	67762	0.02	
Ag	107	He	1.081	1.24	14473	0.01	
Ag	109	He	1.089	3.05	14492	0.01	
Cd	111	He	1.127	0.43	1810	0.06	
Cd	114	He	1.075	1.85	4484	0.02	
Sb	121	He	131.562	0.27	544210	0.02	
Sb	123	He	132.476	0.69	442627	0.03	
Ba	135	He	21.831	2.17	16154	0.14	
Ba	137	He	22.026	1.19	29616	0.07	
Tl	203	He	10.746	1.34	143485	0.01	
Tl	205	He	10.662	0.34	349883	0.00	
[Pb]	206	He	11.170	0.55	115236	0.01	
[Pb]	207	He	11.559	0.33	104771	0.01	
Pb	208	He	11.256	0.16	469038	0.00	

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QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6771026	2.00	6622263	102.25	70	125	
Ge	72	He	140753	1.17	136097	103.42	70	125	
Ge	72	H2	1310412	1.60	1259132	104.07	70	125	
In	115	He	1384104	0.45	1344886	102.92	70	125	
Lu	175	He	3708034	1.07	3597679	103.07	70	125	
Th	232	He	6685841	1.93	6454831	103.58	70	125	

Sample Report

Sample Table

Sample Name	RINSE
Data File Name	039SMPL.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:47:57-07:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	%RSD	QC Flag
Be	9	No Gas	-0.001	-25.88	15	-0.01	
V	51	He	0.013	39.95	189	0.01	
Cr	52	He	0.010	123.66	500	0.00	
Cr	53	He	0.049	64.11	130	0.04	
Mn	55	He	0.011	35.57	59	0.02	
Co	59	He	-0.002	-29.99	54	0.00	
Ni	60	He	-0.076	-5.78	114	-0.07	
Ni	62	He	-0.095	-10.49	18	-0.54	
Cu	63	He	-0.042	-24.46	599	-0.01	
Cu	65	He	-0.055	-20.17	254	-0.02	
Zn	66	He	-0.238	-15.80	659	-0.04	
As	75	He	16.939	5.05	9478	0.18	
Se	77	H2	-0.022	-300.18	1104	0.00	
Se	78	H2	0.031	22.65	30	0.10	
Mo	95	He	0.004	112.89	21	0.02	
Mo	97	He	0.003	200.97	13	0.02	
Mo	98	He	0.002	87.44	31	0.01	
Ag	107	He	0.002	77.02	28	0.01	
Ag	109	He	0.001	88.04	28	0.00	
Cd	111	He	0.001	108.17	7	0.02	
Cd	114	He	0.000	229.86	19	0.00	
Sb	121	He	0.013	41.39	254	0.01	
Sb	123	He	0.011	88.05	201	0.01	
Ba	135	He	-0.002	-529.17	22	-0.01	
Ba	137	He	-0.004	-99.68	23	-0.02	
Tl	203	He	0.006	36.42	153	0.00	
Tl	205	He	0.004	36.09	380	0.00	
[Pb]	206	He	-0.003	-66.85	161	0.00	
[Pb]	207	He	-0.006	-82.00	142	0.00	
Pb	208	He	-0.005	-13.23	688	0.00	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6701808	2.88	6622263	101.20	70	125	
Ge	72	He	135415	1.32	136097	99.50	70	125	
Ge	72	H2	1247769	0.86	1259132	99.10	70	125	
In	115	He	1357236	0.10	1344886	100.92	70	125	
Lu	175	He	3672641	2.19	3597679	102.08	70	125	
Th	232	He	6757143	0.35	6454831	104.68	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	040_CCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:51:42-07:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	24.627	2.886	143457	0.25	25	99	
V	51	He	24.685	0.519	93152	0.05	25	99	
Cr	52	He	24.997	0.950	127229	0.45	25	100	
Cr	53	He	24.683	2.771	15556	2.21	25	99	
Mn	55	He	24.497	0.990	49653	0.82	25	98	
Co	59	He	24.900	1.285	226936	0.86	25	100	
Ni	60	He	25.162	1.930	65509	1.46	25	101	
Ni	62	He	24.970	1.284	10229	1.66	25	100	
Cu	63	He	25.026	0.930	188777	1.48	25	100	
Cu	65	He	25.055	0.823	93716	1.05	25	100	
Zn	66	He	24.576	1.139	23718	0.82	25	98	
As	75	He	32.896	0.762	18518	1.12	-1	-3290	
Se	77	H2	24.930	0.382	7399	1.65	25	100	
Se	78	H2	24.772	2.145	20128	1.15	25	99	
Mo	95	He	25.079	1.562	92035	0.53	25	100	
Mo	97	He	25.787	2.111	61013	1.03	25	103	
Mo	98	He	25.774	0.662	160525	0.53	25	103	
Ag	107	He	25.759	1.507	332487	0.45	25	103	
Ag	109	He	25.623	1.566	328647	0.52	25	102	
Cd	111	He	25.546	1.004	39466	0.67	25	102	
Cd	114	He	25.398	0.461	101822	0.75	25	102	
Sb	121	He	25.660	0.540	102531	0.56	25	103	
Sb	123	He	26.075	1.402	84150	0.30	25	104	
Ba	135	He	25.256	2.762	18017	1.85	25	101	
Ba	137	He	25.369	2.351	32893	1.30	25	101	
Tl	203	He	25.499	1.841	334399	2.36	25	102	
Tl	205	He	25.018	2.369	805995	0.69	25	100	
[Pb]	206	He	25.705	3.387	260152	0.76	25	103	
[Pb]	207	He	25.311	3.734	225029	1.18	25	101	
Pb	208	He	25.400	3.599	1038155	0.86	25	102	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6592071	2.65	6622263	99.54	70	125	
Ge	72	He	136298	0.56	136097	100.15	70	125	
Ge	72	H2	1264808	1.97	1259132	100.45	70	125	
In	115	He	1334982	1.10	1344886	99.26	70	125	
Lu	175	He	3643322	2.71	3597679	101.27	70	125	
Th	232	He	6618882	1.78	6454831	102.54	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	041_CCB.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:55:25-07:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	No Gas	0.000	200.2	23	25.9	0.04	
V	51	He	0.025	7.0	231	3.0	0.4	
Cr	52	He	-0.008	-58.3	402	5.8	0.4	
Cr	53	He	0.088	107.6	152	37.7	0.4	
Mn	55	He	0.005	207.5	47	46.8	0.1	
Co	59	He	-0.001	-128.4	64	14.9	0.04	
Ni	60	He	-0.087	-11.4	86	29.8	0.4	
Ni	62	He	-0.098	-14.6	17	34.6	0.4	
Cu	63	He	-0.052	-11.9	521	8.4	0.2	
Cu	65	He	-0.060	-13.9	232	13.6	0.2	
Zn	66	He	-0.285	-7.7	609	3.0	1	
As	75	He	5.673	3.5	3148	3.1	100	
Se	77	H2	0.061	155.0	1130	3.5	20	
Se	78	H2	0.018	46.2	20	32.8	2	
Mo	95	He	0.006	53.9	30	40.1	0.1	
Mo	97	He	0.006	24.3	20	16.7	0.1	
Mo	98	He	0.004	13.5	40	8.3	0.1	
Ag	107	He	0.002	7.7	31	6.2	0.04	
Ag	109	He	0.003	41.2	48	29.0	0.04	
Cd	111	He	0.003	30.7	10	15.6	0.04	
Cd	114	He	0.002	89.9	26	32.9	0.04	
Sb	121	He	-0.005	-161.0	178	17.8	0.2	
Sb	123	He	-0.005	-38.3	146	4.0	0.1	
Ba	135	He	-0.009	-134.2	17	52.9	0.1	
Ba	137	He	-0.006	-100.4	22	33.5	0.1	
Tl	203	He	0.026	20.0	419	16.0	0.04	
Tl	205	He	0.025	13.8	1071	10.6	0.04	
[Pb]	206	He	-0.007	-36.3	124	20.1	0.1	
[Pb]	207	He	-0.010	-13.0	102	11.5	0.1	
Pb	208	He	-0.008	-9.9	567	5.6	0.1	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6744728	0.37	6622263	101.85	70	125	
Ge	72	He	133952	0.42	136097	98.42	70	125	
Ge	72	H2	1253047	1.59	1259132	99.52	70	125	
In	115	He	1344549	0.62	1344886	99.97	70	125	
Lu	175	He	3692411	0.46	3597679	102.63	70	125	
Th	232	He	6586007	0.30	6454831	102.03	70	125	

Low Level Continuing Calibration Verification (LLCCV) Report

Sample Table

Sample Name	LLCCVS
Data File Name	042LCCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T12:59:10-07:00
Sample Type	LLCCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	0.032	12.796	205	9.74	0.04	81	
V	51	He	0.383	13.057	1557	11.26	0.4	96	
Cr	52	He	0.409	1.790	2478	1.50	0.4	102	
Cr	53	He	0.429	14.601	362	10.75	0.4	107	
Mn	55	He	0.100	5.537	236	3.56	0.1	100	
Co	59	He	0.033	24.652	370	18.62	0.04	83	
Ni	60	He	0.300	7.516	1069	4.99	0.4	75	
Ni	62	He	0.260	18.387	160	13.01	0.4	65	
Cu	63	He	0.144	5.727	1967	2.89	0.2	72	
Cu	65	He	0.144	14.485	977	7.26	0.2	72	
~~Zn~~	~~66~~	~~He~~	~~0.553~~	~~10.598~~	~~1372~~	~~5.68~~	~~1~~	~~55~~	~~LLCCV Failed~~
As	75	He	5.408	0.070	2998	1.13	-1	-541	
Se	77	H2	1.811	2.673	1565	2.11	2	91	
Se	78	H2	1.770	2.615	1430	3.71	2	88	
Mo	95	He	0.087	5.597	333	5.00	0.1	87	
Mo	97	He	0.111	3.414	273	3.23	0.1	111	
Mo	98	He	0.096	14.132	622	13.23	0.1	96	
Ag	107	He	0.044	15.239	584	14.84	0.04	110	
Ag	109	He	0.042	11.659	561	10.70	0.04	105	
Cd	111	He	0.038	15.730	64	14.88	0.04	94	
Cd	114	He	0.039	12.560	174	11.89	0.04	96	
Sb	121	He	0.091	0.620	572	0.29	0.1	91	
Sb	123	He	0.098	8.531	483	4.96	0.1	98	
Ba	135	He	0.092	31.428	90	22.53	0.1	92	
Ba	137	He	0.100	4.630	161	4.31	0.1	100	
Tl	203	He	0.040	2.346	597	0.97	0.04	99	
Tl	205	He	0.041	6.697	1575	5.22	0.04	103	
[Pb]	206	He	0.091	12.097	1116	10.18	0.1	91	
[Pb]	207	He	0.092	0.826	1016	0.68	0.1	92	
Pb	208	He	0.090	5.694	4603	3.37	0.1	90	

2X
MMR
4/17/15

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6546637	2.05	6622263	98.86	70	125	
Ge	72	He	133819	1.18	136097	98.33	70	125	
Ge	72	H2	1252752	1.89	1259132	99.49	70	125	
In	115	He	1358753	0.69	1344886	101.03	70	125	
Lu	175	He	3661812	1.22	3597679	101.78	70	125	
Th	232	He	6606124	2.06	6454831	102.34	70	125	

Low Level Continuing Calibration Verification (LLCCV) Report

Sample Table

Sample Name	LLCCVS
Data File Name	043LCCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T13:02:57-07:00
Sample Type	LLCCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

NR
4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	0.034	2.658	221	2.32	0.04	85	
V	51	He	0.373	6.481	1542	4.22	0.4	93	
Cr	52	He	0.380	6.011	2371	4.22	0.4	95	
Cr	53	He	0.352	28.452	319	19.28	0.4	88	
Mn	55	He	0.105	16.431	249	15.47	0.1	105	
Co	59	He	0.034	10.522	378	9.44	0.04	84	
Ni	60	He	0.277	8.188	1024	4.56	0.4	69	LLCCV Failed
Ni	62	He	0.333	30.930	192	23.42	0.4	83	
Cu	63	He	0.137	7.829	1941	4.14	0.2	69	
Cu	65	He	0.142	20.139	987	12.42	0.2	71	
Zn	66	He	0.561	5.381	1400	3.56	1	56	LLCCV Failed
As	75	He	4.759	0.997	2679	2.45	-1	-476	
Se	77	H2	1.863	5.901	1589	1.43	2	93	
Se	78	H2	1.786	1.006	1453	1.83	2	89	
Mo	95	He	0.096	9.936	366	10.04	0.1	96	
Mo	97	He	0.099	28.240	244	27.32	0.1	99	
Mo	98	He	0.092	9.417	599	8.95	0.1	92	
Ag	107	He	0.042	14.213	552	13.85	0.04	104	
Ag	109	He	0.044	6.420	587	5.99	0.04	110	
Cd	111	He	0.040	11.779	68	10.59	0.04	101	
Cd	114	He	0.040	5.771	181	5.01	0.04	101	
Sb	121	He	0.094	2.845	579	1.76	0.1	94	
Sb	123	He	0.093	4.522	467	3.17	0.1	93	
Ba	135	He	0.106	42.296	100	32.14	0.1	106	
Ba	137	He	0.111	14.110	174	11.48	0.1	111	
Tl	203	He	0.035	6.757	543	7.08	0.04	89	
Tl	205	He	0.035	4.732	1370	2.43	0.04	87	
[Pb]	206	He	0.092	12.104	1134	9.13	0.1	92	
[Pb]	207	He	0.090	13.824	1000	9.96	0.1	90	
Pb	208	He	0.090	6.743	4628	4.35	0.1	90	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6728557	0.13	6622263	101.61	70	125	
Ge	72	He	135754	1.69	136097	99.75	70	125	
Ge	72	H2	1261411	2.40	1259132	100.18	70	125	
In	115	He	1354647	0.35	1344886	100.73	70	125	
Lu	175	He	3686167	1.66	3597679	102.46	70	125	
Th	232	He	6681852	0.24	6454831	103.52	70	125	

Low Level Continuing Calibration Verification (LLCCV) Report

Sample Table

Sample Name	LLCCVS
Data File Name	044LCCV.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T13:06:41-07:00
Sample Type	LLCCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

NR 4/17/15

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	0.031	9.819	200	6.70	0.04	77	
V	51	He	0.386	4.549	1595	3.33	0.4	97	
Cr	52	He	0.368	3.678	2314	2.32	0.4	92	
Cr	53	He	0.419	8.045	362	5.62	0.4	105	
Mn	55	He	0.086	14.713	211	12.76	0.1	86	
Co	59	He	0.031	2.572	353	2.50	0.04	77	
Ni	60	He	0.303	9.285	1096	7.42	0.4	76	
Ni	62	He	0.297	41.482	178	28.70	0.4	74	
Cu	63	He	0.142	18.822	1980	9.23	0.2	71	
Cu	65	He	0.148	14.690	1009	8.77	0.2	74	
Zn	66	He	0.545	10.516	1389	3.00	1	55	LLCCV Failed
As	75	He	4.101	3.382	2316	4.16	-1	-410	
Se	77	H2	1.597	15.256	1527	3.76	2	80	
Se	78	H2	1.790	0.786	1461	3.03	2	89	
Mo	95	He	0.096	10.688	367	9.83	0.1	96	
Mo	97	He	0.089	29.599	222	28.16	0.1	89	
Mo	98	He	0.102	10.737	668	10.99	0.1	102	
Ag	107	He	0.043	3.725	572	4.29	0.04	107	
Ag	109	He	0.042	10.614	569	9.74	0.04	106	
Cd	111	He	0.039	5.280	68	5.19	0.04	99	
Cd	114	He	0.036	6.144	166	5.31	0.04	91	
Sb	121	He	0.092	9.723	579	6.26	0.1	92	
Sb	123	He	0.095	2.619	477	1.82	0.1	95	
Ba	135	He	0.083	38.067	84	26.87	0.1	83	
Ba	137	He	0.096	12.330	157	10.07	0.1	96	
Tl	203	He	0.036	7.647	551	7.22	0.04	89	
Tl	205	He	0.035	10.327	1408	8.29	0.04	88	
[Pb]	206	He	0.094	9.852	1163	8.19	0.1	94	
[Pb]	207	He	0.084	6.404	960	4.27	0.1	84	
Pb	208	He	0.090	2.404	4643	1.03	0.1	90	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6688585	2.27	6622263	101.00	70	125	
Ge	72	He	136127	0.82	136097	100.02	70	125	
Ge	72	H2	1265625	2.38	1259132	100.52	70	125	
In	115	He	1366291	0.66	1344886	101.59	70	125	
Lu	175	He	3719312	1.06	3597679	103.38	70	125	
Th	232	He	6664029	0.86	6454831	103.24	70	125	

Low Level Continuing Calibration Verification (LLCCV) Report

Sample Table

Sample Name	LLCCVS 0.5
Data File Name	045_QC1.d
Data Path Name	D:\Data\Experiments\041715A.b
Acq Date Time	2015-04-17T13:10:26-07:00
Sample Type	QC1
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	QC Flag
Be	9	No Gas	0.071	13.023	455	11.61	0.08	89	
V	51	He	0.739	10.229	2952	9.26	0.8	92	
Cr	52	He	0.792	3.726	4506	2.19	0.8	99	
Cr	53	He	0.797	8.825	604	8.19	0.8	100	
Mn	55	He	0.190	15.899	426	16.13	0.2	95	
Co	59	He	0.061	5.798	639	6.52	0.08	77	
Ni	60	He	0.683	1.383	2100	1.51	0.8	85	
Ni	62	He	0.618	22.279	311	17.68	0.8	77	
Cu	63	He	0.370	5.840	3725	2.96	0.4	92	
Cu	65	He	0.337	4.063	1729	4.52	0.4	84	
Zn	66	He	1.541	0.216	2337	1.65	2	77	
As	75	He	4.720	2.415	2690	2.76	-1	-472	
Se	77	H2	3.511	5.791	2069	4.33	4	88	
Se	78	H2	3.623	0.943	3038	1.33	4	91	
Mo	95	He	0.191	9.359	727	9.55	0.2	96	
Mo	97	He	0.192	15.796	472	16.72	0.2	96	
Mo	98	He	0.191	4.651	1235	5.28	0.2	96	
Ag	107	He	0.083	6.664	1107	6.44	0.08	104	
Ag	109	He	0.082	9.040	1089	7.94	0.08	102	
Cd	111	He	0.081	5.593	133	5.14	0.08	101	
Cd	114	He	0.072	6.697	314	5.85	0.08	90	
Sb	121	He	0.205	2.734	1040	2.94	0.2	103	
Sb	123	He	0.195	3.414	806	1.67	0.2	97	
Ba	135	He	0.219	21.181	183	18.98	0.2	109	
Ba	137	He	0.230	3.483	334	4.15	0.2	115	
Tl	203	He	0.074	9.034	1043	8.33	0.08	92	
Tl	205	He	0.075	7.182	2672	7.01	0.08	94	
[Pb]	206	He	0.206	1.850	2282	1.63	0.2	103	
[Pb]	207	He	0.205	5.332	2015	2.73	0.2	102	
Pb	208	He	0.202	0.842	9157	1.38	0.2	101	

QC ISTD Table

Name	Mass	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Sc	45	No Gas	6890283	2.06	6622263	104.05	70	125	
Ge	72	He	137478	1.54	136097	101.01	70	125	
Ge	72	H2	1302820	1.89	1259132	103.47	70	125	
In	115	He	1366597	1.12	1344886	101.61	70	125	
Lu	175	He	3647767	2.13	3597679	101.39	70	125	
Th	232	He	6552533	0.66	6454831	101.51	70	125	

BROOKS RAND LABS

MEANINGFUL METALS DATA®

April 28, 2015

Jessica Vickers
Tetra Tech
1955 Evergreen Blvd Suite 300
Duluth, GA 30094
(502) 724-3138

Project Name: Wiley Property

Ms. Vickers,

Attached is the report associated with one (1) solid sample submitted for arsenic speciation analysis on March 26, 2015. The sample was received on March 31, 2015 in a sealed container at ambient temperature. Arsenic speciation analysis was performed via ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS). Any issues associated with the analyses are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

Russell Gerads
Business Development Director
Brooks Rand Labs, LLC

Applied Speciation and Consulting, LLC

Report Prepared for:

Jessica Vickers
Tetra Tech
1955 Evergreen Blvd Suite 300
Duluth, GA 30094

April 28, 2015

1. Sample Reception

One (1) solid sample was submitted for arsenic speciation analysis on March 26, 2015. The sample was received in acceptable condition in a sealed container at ambient temperature on March 31, 2015, as indicated on the attached chain of custody (COC) form.

The sample was received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and assigned discrete sample identifiers. The sample was stored in a secure polyethylene container, known to be free from trace metals contamination, until extraction and analysis could be performed.

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are also monitored for contamination to account for any biases associated with the sample results.

Arsenic Speciation Analysis by IC-ICP-DRC-MS Approximately 0.1g of solid material was dissolved in 40mL of ultrapure deionized water.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. All calibration curves, associated with each species of interest, are standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimum interval of every ten analytical runs.

Arsenic Speciation Analysis by IC-ICP-DRC-MS All samples for arsenite, arsenate, monomethylarsonic acid, and dimethylarsenic acid quantitation were analyzed by ion chromatography inductively coupled plasma dynamic reaction cell mass spectrometry (IC-ICP-DRC-MS). Aliquots of each sample are injected onto an anion exchange column and are mobilized by an alkaline (pH > 7) gradient. The eluting arsenic species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (DRC) containing a specific reactive gas which preferentially reacts with the target analyte, producing an entirely different mass to charge ratio (m/z) which can then be differentiated from the initial interferences. A solid-state detector detects ions transmitted through the mass analyzer on the basis of their mass-to-charge ratio (m/z), and the resulting current is processed by a data handling system.

Retention times for each eluting species are compared to known standards for species identification.

4. Analytical Issues

No significant issues were encountered during the requested analyses. All quality control parameters associated with these samples were within acceptance limits with the following exception:

The estimated method detection limits (eMDLs) for arsenite, arsenate, and dimethylarsinic acid are generated using the standard deviation of replicate analyses of the lowest standard in the calibration curve. The eMDL for monomethylarsonic acid has been calculated using the average eMDL of arsenite, arsenate, and dimethylarsinic acid; the calibration does not contain monomethylarsonic acid due to impurities in this standard which would bias the results for other arsenic species.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Russell Gerads
Business Development Director
Brooks Rand Labs, LLC

Arsenic Results for TestAmerica
Project Name: Wiley Property
Contact: Jessica Vickers

Report Date: April 28, 2015
Report Generated by: Russell Gerads
Brooks Rand Labs, LLC

Sample Results

Sample ID	As(III)	As(V)	MMAs	DMAs
WP-03245-W	3840	< 200 U	< 160 U	< 210 U

All results reflect the applied dilution and are reported in mg/kg
U = Concentration is below the eMDL

Arsenic Results for TestAmerica
Project Name: Wiley Property
Contact: Jessica Vickers

Report Date: April 28, 2015
Report Generated by: Russell Gerads
Brooks Rand Labs, LLC

Quality Control Summary - Preparation Blank Summary

Analyte	Units	PBW1	PBW2	PBW3	PBW4	Mean	StdDev
As(III)	mg/kg	0	0	239	0	60	119
As(V)	mg/kg	0	0	0	0	0	0
MMAs	mg/kg	0	0	0	0	0	0
DMAs	mg/kg	0	0	0	0	0	0

eMDL = Estimated Method Detection Limit; RL = Reporting Limit
*Please see narrative regarding eMDL calculations

Quality Control Summary - Certified Reference Materials

Analyte	Units	CRM	True Value	Result	Recovery
As(III)	ug/L	LCS	5.000	5.414	108.3
As(V)	ug/L	LCS	5.000	5.014	100.3
MMAs	ug/L	LCS	5.073	5.880	115.9
DMAs	ug/L	LCS	3.625	3.656	100.8

Arsenic Results for TestAmerica
Project Name: Wiley Property
Contact: Jessica Vickers

Report Date: April 28, 2015
Report Generated by: Russell Gerads
Brooks Rand Labs, LLC

Quality Control Summary - Matrix Duplicates

Analyte	Units	Sample ID	Rep 1	Rep 2	Mean	RPD
As(III)	mg/kg	WP-03245-W	3841	3919	3880	2.0
As(V)	mg/kg	WP-03245-W	< 200 U	< 200 U	NC	NC
MMAs	mg/kg	WP-03245-W	< 160 U	< 160 U	NC	NC
DMAs	mg/kg	WP-03245-W	< 210 U	< 210 U	NC	NC

U = Concentration is below the eMDL

NC = Not calculated due to one or more concentrations below the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte	Units	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	MSD Resu
As(III)	mg/kg	WP-03245-W	80890	79220	97.9	80890	78840
As(V)	mg/kg	WP-03245-W	80890	75410	93.2	80890	75640
DMAs	mg/kg	WP-03245-W	84850	78500	92.5	84850	78270

APPLIED SPECIATION AND CONSULTING, LLC

18804 Northcreek Parkwa
Bothell, WA 98011

Company Name: Tetra Tech
Contact Person: Jessica Vickers
Address: 1955 Evlr Green Blvd., 300
Duluth GA 30096
Phone Number: 502.724.1220
Fax Number: 678.775.3138
Email Address: jessica.vickers@tetratech.com
Project Name: Wilty Property
Project Number:
PO Number:

ASC Project Manager:
By submitting of samples the client agr
forth in the quotation provided by the
familiar with the term and conditions a
contact your ASC representative as soo
Requested Turn Around Time:
Method of Sample Delivery:
Currier Tracking Number:
Confirmation of Sample Reception:

Sample ID	Bottle ID	Date and Time	Matrix*	Volume	Preservative	Initials	Requested Analytes an
WP-03245-W	—	3/24/15/1300	Waste	2, 1oz	NONE	[illegible]	Arsenic Specia

Relinquished by: (sign) [illegible] (print) Shum Vudman Date/Time: 3/26/15/1300
Received by: (sign) [illegible] (print) Jacki Aitken Date/Time: 3/31/15 1200

Relinquished by: (sign) _____ (print) _____ Date/Time: _____
Received by: (sign) _____ (print) _____ Date/Time: _____

Please account for each sample bottle as a seperate line item for verification purposes.

*Matrix: Air, Freshwater (FW), seawater (SW), groundwater (GW), wastewater (WW), soil (SL), sediment (SD), tissue (TS), product (P), other (O)

ALS Environmental

27-Oct-2015

Jessica Vickers
Tetra Tech, Inc.
4967 Highway 42
Suite 210
Louisville, KY 40222

Tel: (502) 569-9067
Fax:

Re: 103X902702002.001F

Work Order: **15101119**

Dear Jessica,

ALS Environmental received 9 samples on 23-Oct-2015 10:09 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 9.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 27-Oct-15

Client: Tetra Tech, Inc.
Project: 103X902702002.001F
Work Order: **15101119**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15101119-01	WP-102115-PA-01	Air		10/21/2015	10/23/2015 10:09	☐
15101119-02	WP-102115-PA-02	Air		10/21/2015	10/23/2015 10:09	☐
15101119-03	WP-102115-AA-01	Air		10/21/2015	10/23/2015 10:09	☐
15101119-04	WP-102115-AA-02	Air		10/21/2015	10/23/2015 10:09	☐
15101119-05	WP-102115-AA-03	Air		10/21/2015	10/23/2015 10:09	☐
15101119-06	WP-102115-AA-04	Air		10/21/2015	10/23/2015 10:09	☐
15101119-07	WP-102115-AA-05	Air		10/21/2015	10/23/2015 10:09	☐
15101119-08	WP-102115-AA-06	Air		10/21/2015	10/23/2015 10:09	☐
15101119-09	WP-102115-AA-FB01	Air		10/21/2015	10/23/2015 10:09	☐

Client: Tetra Tech, Inc.
Project: 103X902702002.001F
Work Order: 15101119

Case Narrative

The sample condition upon receipt was acceptable except where noted.

Results relate only to the items tested and are not blank corrected unless indicated.

ALS Environmental

Date: *27-Oct-15*

Client: Tetra Tech, Inc.
Project: 103X902702002.001F

Work Order: 15101119

Analytical Results

Lab ID: 15101119-01A
Client Sample ID: WP-102115-PA-01

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **1769.9** Analyst: **VAW**
Date Analyzed: 10/26/2015 13:41

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0	<0.00057

Lab ID: 15101119-02A
Client Sample ID: WP-102115-PA-02

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **1130.9** Analyst: **VAW**
Date Analyzed: 10/26/2015 13:44

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0	<0.00088

Lab ID: 15101119-03A
Client Sample ID: WP-102115-AA-01

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **1474.3** Analyst: **VAW**
Date Analyzed: 10/26/2015 13:47

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0	<0.00068

Lab ID: 15101119-04A
Client Sample ID: WP-102115-AA-02

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **1459.8** Analyst: **VAW**
Date Analyzed: 10/26/2015 13:51

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0	<0.00069

Note:

ALS Environmental

Date: *27-Oct-15*

Client: Tetra Tech, Inc.
Project: 103X902702002.001F

Work Order: 15101119

Analytical Results

Lab ID: 15101119-05A
Client Sample ID: WP-102115-AA-03

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.		Method: **N7300**	Air Volume (L): **1512**	Analyst: **VAW**
Date Analyzed: 10/26/2015 13:54		Reporting Limit		
	µg/sample	µg/sample	mg/m3	
Arsenic	ND	1.0	<0.00066	

Lab ID: 15101119-06A
Client Sample ID: WP-102115-AA-04

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.		Method: **N7300**	Air Volume (L): **1516.8**	Analyst: **VAW**
Date Analyzed: 10/26/2015 13:57		Reporting Limit		
	µg/sample	µg/sample	mg/m3	
Arsenic	ND	1.0	<0.00066	

Lab ID: 15101119-07A
Client Sample ID: WP-102115-AA-05

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.		Method: **N7300**	Air Volume (L): **1492.8**	Analyst: **VAW**
Date Analyzed: 10/26/2015 14:00		Reporting Limit		
	µg/sample	µg/sample	mg/m3	
Arsenic	ND	1.0	<0.00067	

Lab ID: 15101119-08A
Client Sample ID: WP-102115-AA-06

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD.		Method: **N7300**	Air Volume (L): **1502.4**	Analyst: **VAW**
Date Analyzed: 10/26/2015 14:04		Reporting Limit		
	µg/sample	µg/sample	mg/m3	
Arsenic	ND	1.0	<0.00067	

Note:

ALS Environmental

Date: *27-Oct-15*

Client: Tetra Tech, Inc.
Project: 103X902702002.001F

Work Order: 15101119

Analytical Results

Lab ID: 15101119-09A
Client Sample ID: WP-102115-AA-FB01

Collection Date: 10/21/2015
Matrix: AIR

Analyses

METALS BY NIOSH 7300 MOD. Method: **N7300** Air Volume (L): **0** Analyst: **VAW**

Date Analyzed: 10/26/2015 14:20

	µg/sample	Reporting Limit µg/sample	mg/m3
Arsenic	ND	1.0	NA

Note:

Date: 27-Oct-15

ALS Environmental

QC BATCH REPORT

Client: Tetra Tech, Inc.
Work Order: 15101119
Project: 103X902702002.001F

Batch ID: **31582** Instrument ID: **ICP1** Method: **N7300**

MBLK Sample ID: **mblk-31582-31582** Units: **µg/sample** Analysis Date: **10/26/2015 01:19 PM**
Client ID: Run ID: **ICP1_151026A** SeqNo: **1160577** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	1.0								

LCS Sample ID: **lcs-31582-31582** Units: **µg/sample** Analysis Date: **10/26/2015 01:23 PM**
Client ID: Run ID: **ICP1_151026A** SeqNo: **1160578** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	21.19	1.0	20	0	106	80-120	0			

LCSD Sample ID: **lcsd-31582-31582** Units: **µg/sample** Analysis Date: **10/26/2015 01:25 PM**
Client ID: Run ID: **ICP1_151026A** SeqNo: **1160579** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	21.31	1.0	20	0	107	80-120	21.19	0.565	20	

The following samples were analyzed in this batch:

15101119-01a	15101119-02a	15101119-03a
15101119-04a	15101119-05a	15101119-06a
15101119-07a	15101119-08a	15101119-09a

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 27-Oct-15

Client: Tetra Tech, Inc.
Project: 103X902702002.001F
WorkOrder: **15101119**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
µg/sample	

ALS Environmental

Sample Receipt Checklist

Client Name: TETRATECH-LOUISVILLE

Date/Time Received: 23-Oct-15 10:09

Work Order: 15101119

Received by: SNH

Checklist completed by: Shiloh Greenwald (eSignature) 23-Oct-15 (Date)

Reviewed by: Shawn Smythe (eSignature) 23-Oct-15 (Date)

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on 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?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):			
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

ALS ENVIRONMENTAL
4388 Glendale Milford Road, Cincinnati, Ohio 45242
Tel: (513) 733-5336 (800) 458-1493
www.mastest.com

1510111

CHAIN OF CUSTODY FORM FOR AIR SAMPLE ANALYSIS

Client name: Tetra Tech, Inc.
Address: 4967 U.S. Highway 42, Suite 210
Louisville, Kentucky 40222

Contact: Sherry Weedman
Phone: 502-569-9067
Fax:

Project Name/#: 103
Samplers Name: Paul
Sampling Date: 10/2

SAMPLE ID	SAMPLE DESCRIPTION (e.g. Locations, Name, etc)	PUMP NUMBER	TIME			FLOW RATE			VO
			START	END	TOTAL	INITIAL	FINAL	AVG	
WP-102115-PA-01 01	Geoie Krull - Sediment/Air	16930	8:58	18:28	570	3.09	3.12	3.11	17
WP-102115-PA-02 02	Paul Prys - Air/Soil	20166	9:21	15:33	372	3.03	3.05	3.04	11
WP-102115-AA-01 03	House, 1st Floor, Center of Living Room	S7	10:06	18:07	481	2.99	3.14	3.07	14
WP-102115-AA-02 04	House, 1st Floor, Center of Bedroom 1	S5	10:06	18:07	481	2.99	3.08	3.04	14
WP-102115-AA-03 05	House, 1st Floor, Center of Bedroom 2	S2	10:07	18:07	480	3.06	3.24	3.15	15
WP-102115-AA-04 06	House, 1st Floor, Center of Dining Room	S1	10:07	18:07	480	3.05	3.27	3.16	15
WP-102115-AA-05 07	House, 2nd Floor, Center of Bedroom 3	S6	9:58	17:58	480	3.04	3.18	3.11	14
WP-102115-AA-06 08	Cabin, Center of Room	16931	9:47	17:54	487	3.05	3.12	3.09	15
WP-102115-AA-FB01 09	Field Blank	NA	NA	NA	0	NA	NA	0	

Turnaround Time: Normal (5 days): X 3 Days Rush: O 2 Days Rush: O

Comments:

Relinquished By:	[signature]	Date/Time:	10/22/15 @ 1700
Received By:	[signature]	Date/Time:	10/23/15 10:09
Relinquished By:			
Received By:			

DELIVERY METHOD: STD / PRTY MAIL UPS CLIENT DROP BOX FEDEX ALS COURIER OTHER

COOLING METHOD: NONE COOLER WET ICE ICE PACK
CUSTODY SEALS: NONE COOLER PACKAGE SAMPLES
COOLER TEMP: °C

Delivered Direct to Lab:
Method of Shipment: Fedl
Lab Recipient: Sam
Date: 10/2

ALS Environmental

29-Oct-2015

Jessica Vickers
Tetra Tech, Inc.
4967 Highway 42
Suite 210
Louisville, KY 40222

Tel: (502) 569-9067
Fax:

Re: Wiley Property; 103X902702002.001F Work Order: **15101120**

Dear Jessica,

ALS Environmental received 11 samples on 23-Oct-2015 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 17.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 29-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: **15101120**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15101120-01	WP-102015-VC-01	Bulk		10/20/2015 12:08	10/23/2015 10:44	☐
15101120-02	WP-102015-VC-02	Bulk		10/20/2015 12:20	10/23/2015 10:44	☐
15101120-03	WP-102015-VC-03	Bulk		10/20/2015 12:28	10/23/2015 10:44	☐
15101120-04	WP-102015-VC-04	Bulk		10/20/2015 12:40	10/23/2015 10:44	☐
15101120-05	WP-102015-VC-05	Bulk		10/20/2015 12:47	10/23/2015 10:44	☐
15101120-06	WP-102015-VC-06	Bulk		10/20/2015 12:54	10/23/2015 10:44	☐
15101120-07	WP-102015-VC-07	Bulk		10/20/2015 13:07	10/23/2015 10:44	☐
15101120-08	WP-102015-VC-08	Bulk		10/20/2015 13:19	10/23/2015 10:44	☐
15101120-09	WP-102015-VC-09	Bulk		10/20/2015 13:32	10/23/2015 10:44	☐
15101120-10	WP-102015-VC-10	Bulk		10/20/2015 13:41	10/23/2015 10:44	☐
15101120-11	WP-102015-VC-FB01	Bulk		10/20/2015	10/23/2015 10:44	☐

ALS Environmental *Date: 29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101120

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-01
Collection Date: 10/20/2015 12:08 PM

Work Order: 15101120
Lab ID: 15101120-01
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015	Reporting Limit		
	mg/sample	mg/sample	mg/m3
Dust	**0.17**	**0.050**	**NA**

METALS BY ICP	Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 13:41	Reporting Limit		
	µg/sample	µg/sample	**ug/cm2**
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-02
Collection Date: 10/20/2015 12:20 PM

Work Order: 15101120
Lab ID: 15101120-02
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	ND	0.050	NA

METALS BY ICP	Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 13:44			
	µg/sample	Reporting Limit µg/sample	ug/cm2
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-03
Collection Date: 10/20/2015 12:28 PM

Work Order: 15101120
Lab ID: 15101120-03
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015	Reporting Limit		
	mg/sample	mg/sample	mg/m3
Dust	**0.70**	**0.050**	**NA**

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 13:47	Reporting Limit		
	µg/sample	µg/sample	ug/cm2
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-04
Collection Date: 10/20/2015 12:40 PM

Work Order: 15101120
Lab ID: 15101120-04
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	**0.89**	**0.050**	**NA**

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 13:57			
	µg/sample	Reporting Limit µg/sample	ug/cm2
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-05
Collection Date: 10/20/2015 12:47 PM

Work Order: 15101120
Lab ID: 15101120-05
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	2.9	0.050	NA

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 14:00			
	µg/sample	Reporting Limit µg/sample	ug/cm2
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-06
Collection Date: 10/20/2015 12:54 PM

Work Order: 15101120
Lab ID: 15101120-06
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	**1.9**	**0.050**	**NA**

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 14:03			
	µg/sample	Reporting Limit µg/sample	ug/cm2
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-07
Collection Date: 10/20/2015 01:07 PM

Work Order: 15101120
Lab ID: 15101120-07
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: N0500	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/26/2015	Reporting Limit		
	mg/sample	mg/sample	mg/m3
Dust	**0.48**	**0.050**	**NA**

METALS BY ICP	Method: SW6010B	Area 100 cm2	Analyst: VAW
Date Analyzed: 10/29/2015 14:06	Reporting Limit		
	µg/sample	µg/sample	ug/cm2
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-08
Collection Date: 10/20/2015 01:19 PM

Work Order: 15101120
Lab ID: 15101120-08
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	**3.1**	**0.050**	**NA**

METALS BY ICP	Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 14:09			
	µg/sample	Reporting Limit µg/sample	**ug/cm2**
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-09
Collection Date: 10/20/2015 01:32 PM

Work Order: 15101120
Lab ID: 15101120-09
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015	Reporting Limit		
	mg/sample	mg/sample	mg/m3
Dust	**16**	**0.050**	**NA**

METALS BY ICP	Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 14:13	Reporting Limit		
	µg/sample	µg/sample	**ug/cm2**
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-10
Collection Date: 10/20/2015 01:41 PM

Work Order: 15101120
Lab ID: 15101120-10
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: **N0500**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	**5.7**	**0.050**	**NA**

METALS BY ICP	Method: **SW6010B**	Area **100 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 14:16			
	µg/sample	µg/sample	**ug/cm2**
Arsenic	ND	5.0	<0.050

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102015-VC-FB01
Collection Date: 10/20/2015

Work Order: 15101120
Lab ID: 15101120-11
Matrix: BULK

Analytical Results

Analyses

NIOSH 0500 PARTICULATES NOT REGULATED	Method: **N0500**	Area **0 cm2**	Analyst: **VAW**
Date Analyzed: 10/26/2015			
	mg/sample	Reporting Limit mg/sample	mg/m3
Dust	ND	0.050	NA

METALS BY ICP	Method: **SW6010B**	Area **0 cm2**	Analyst: **VAW**
Date Analyzed: 10/29/2015 14:19			
	µg/sample	Reporting Limit µg/sample	ug/cm2
Arsenic	ND	5.0	NA

Note:

Date: 29-Oct-15

ALS Environmental

QC BATCH REPORT

Client: Tetra Tech, Inc.
Work Order: 15101120
Project: Wiley Property; 103X902702002.001F

Batch ID: **31706** Instrument ID: **ICP3** Method: **SW6010B**

MBLK Sample ID: **mblk-31706-31706** Units: **µg/sample** Analysis Date: **10/29/2015 01:32 PM**
Client ID: Run ID: **ICP3_151029A** SeqNo: **1163324** Prep Date: **10/29/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	5.0								

LCS Sample ID: **lcs-31706-31706** Units: **µg/sample** Analysis Date: **10/29/2015 01:35 PM**
Client ID: Run ID: **ICP3_151029A** SeqNo: **1163325** Prep Date: **10/29/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	20.66	5.0	20	0	103	80-120	0			

LCSD Sample ID: **lcsd-31706-31706** Units: **µg/sample** Analysis Date: **10/29/2015 01:38 PM**
Client ID: Run ID: **ICP3_151029A** SeqNo: **1163326** Prep Date: **10/29/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	20.4	5.0	20	0	102	80-120	20.66	1.27	20	

The following samples were analyzed in this batch:

15101120-01a	15101120-02a	15101120-03a
15101120-04a	15101120-05a	15101120-06a
15101120-07a	15101120-08a	15101120-09a
15101120-10a	15101120-11a	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 29-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
WorkOrder: **15101120**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
µg/sample	
mg/sample	

ALS Environmental

Sample Receipt Checklist

Client Name: **TETRATECH-LOUISVILLE**

Date/Time Received: **23-Oct-15 00:00**

Work Order: **15101120**

Received by: **SVH**

Checklist completed by: Shiloh Greenwald (eSignature) 23-Oct-15 (Date)

Reviewed by: Shawn Smythe (eSignature) 23-Oct-15 (Date)

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on 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?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):			
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

ALS ENVIRONMENTAL
4388 Glendale Milford Road, Cincinnati, Ohio 45242
Tel: (513) 733-5336 (800) 458-1493

15101120

CHAIN OF CUSTODY

COMPANY: Tetra Tech, Inc.

ADDRESS: 4967 U.S. Highway 42, Suite 210, Louisville, KY 40222

PHONE: 404-849-7136

FAX:

SAMPLED BY: Paul Prys

SIGNATURE:

ANALYSIS REQUESTED: Total Arsenic

PRESERVATION (See codes): NA

#	SAMPLE ID		SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	Total Arsenic (NA)
1	WP-102015-VC-01	01	10/20/2015	12:08	X		O	X
2	WP-102015-VC-02	02	10/20/2015	12:20	X		O	X
3	WP-102015-VC-03	03	10/20/2015	12:28	X		O	X
4	WP-102015-VC-04	04	10/20/2015	12:40	X		O	X
5	WP-102015-VC-05	05	10/20/2015	12:47	X		O	X
6	WP-102015-VC-06	06	10/20/2015	12:54	X		O	X
7	WP-102015-VC-07	07	10/20/2015	13:07	X		O	X
8	WP-102015-VC-08	08	10/20/2015	13:19	X		O	X
9	WP-102015-VC-09	09	10/20/2015	13:32	X		O	X
10	WP-102015-VC-10	10	10/20/2015	13:41	X		O	X
11	WP-102015-VC-FB01	11	10/20/2015	N/A	X		O	X
12								
13								
14								

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1:	10/22/15@1800	1:	10/23/15 1011
2:		2:	
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:
Also, please email results to sherry.weedman@tetratech.com

SHIPMENT METHOD
OUT 10/22/15 VIA: Air
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: Wiley Property
PROJECT #: 103X902702002.001F
SITE ADDRESS: 209 Shinkle Chapel Road, Hartford, Kentucky
SEND REPORT TO: jessica.vickers@tetratech.co
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #:
PO#

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY;
SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE M

DELIVERY METHOD: STD / PRTY MAIL UPS CLIENT DROP BOX FEDEX AES COURIER OTHER

COOLING METHOD: NONE COOLER WET ICE ICE PACK
CUSTODY SEALS: NONE COOLER PACKAGE SAMPLES
COOLER TEMP: °C

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks)
PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I =

ALS Environmental

29-Oct-2015

Sherry Weedman
Tetra Tech, Inc.
4967 Highway 42
Suite 210
Louisville, KY 40222

Tel: (502) 569-9067
Fax:

Re: Wiley Property; 103X902702002.001F

Work Order: **15101122**

Dear Sherry,

ALS Environmental received 6 samples on 23-Oct-2015 10:24 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 13.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 29-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: **15101122**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15101122-01	WP-102115-SD-01 (With MS/MSD)	Soil		10/21/2015 15:08	10/23/2015 10:24	☐
15101122-02	WP-102115-SD-02	Soil		10/21/2015 15:20	10/23/2015 10:24	☐
15101122-03	WP-102115-SD-03	Soil		10/21/2015 15:32	10/23/2015 10:24	☐
15101122-04	WP-102115-SD-04	Soil		10/21/2015 15:40	10/23/2015 10:24	☐
15101122-05	WP-102115-SD-05	Soil		10/21/2015 15:52	10/23/2015 10:24	☐
15101122-06	WP-102115-SD-05-DUP	Soil		10/21/2015 15:55	10/23/2015 10:24	☐

ALS Environmental

Date: 29-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101122

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-01 (With MS/MSD)
Collection Date: 10/21/2015 03:08 PM

Work Order: 15101122
Lab ID: 15101122-01
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**12**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/29/2015**	Analyst: **VAW**
Arsenic	**150**		**5.4**	**mg/Kg-dry**	1	10/29/2015 11:25 AM

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-02
Collection Date: 10/21/2015 03:20 PM

Work Order: 15101122
Lab ID: 15101122-02
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**8.7**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**230**		**5.0**	**mg/Kg-dry**	1	10/26/2015 04:45 PM

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-03
Collection Date: 10/21/2015 03:32 PM

Work Order: 15101122
Lab ID: 15101122-03
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**11**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**570**		**5.2**	**mg/Kg-dry**	1	10/26/2015 04:47 PM

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-04
Collection Date: 10/21/2015 03:40 PM

Work Order: 15101122
Lab ID: 15101122-04
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**22**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**3,000**		**5.5**	**mg/Kg-dry**	1	10/26/2015 05:03 PM

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-05
Collection Date: 10/21/2015 03:52 PM

Work Order: 15101122
Lab ID: 15101122-05
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**19**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**5,200**		**5.9**	**mg/Kg-dry**	1	10/26/2015 05:05 PM

Note:

ALS Environmental

Date: *29-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SD-05-DUP
Collection Date: 10/21/2015 03:55 PM

Work Order: 15101122
Lab ID: 15101122-06
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**16**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**5,600**		**5.0**	**mg/Kg-dry**	1	10/26/2015 05:08 PM

Note:

ALS Environmental

Date: 29-Oct-15

Client: Tetra Tech, Inc.
Work Order: 15101122
Project: Wiley Property; 103X902702002.001F

QC BATCH REPORT

Batch ID: **31585** Instrument ID: **ICP3** Method: **SW6010B**

MBLK Sample ID: **mblk-31585-31585**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160914** Analysis Date: **10/26/2015 04:27 PM** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	5.0								

LCS Sample ID: **lcs-31585-31585**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160915** Analysis Date: **10/26/2015 04:30 PM** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	105.1	5.0	100	0	105	80-120	0			

LCSD Sample ID: **lcsd-31585-31585**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160916** Analysis Date: **10/26/2015 04:33 PM** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	103.9	5.0	100	0	104	80-120	105.1	1.15	20	

MS Sample ID: **15101029-03b ms**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160918** Analysis Date: **10/26/2015 04:39 PM** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	93.39	4.5	90.76	5.223	97.1	75-125	0			

MSD Sample ID: **15101029-03b msd**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160919** Analysis Date: **10/26/2015 04:42 PM** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	88.59	4.2	84.86	5.223	98.2	75-125	93.39	5.27	20	

The following samples were analyzed in this batch:

15101122-02a	15101122-03a	15101122-04a
15101122-05a	15101122-06a	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Tetra Tech, Inc.
Work Order: 15101122
Project: Wiley Property; 103X902702002.001F

QC BATCH REPORT

Batch ID: **31695** Instrument ID: **ICP3** Method: **SW6010B**

MBLK Sample ID: **mblk-31695-31695** Units: **mg/Kg** Analysis Date: **10/29/2015 11:10 AM**
Client ID: Run ID: **ICP3_151029A** SeqNo: **1163038** Prep Date: **10/29/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	5.0								

LCS Sample ID: **lcs-31695-31695** Units: **mg/Kg** Analysis Date: **10/29/2015 11:13 AM**
Client ID: Run ID: **ICP3_151029A** SeqNo: **1163039** Prep Date: **10/29/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	101.9	5.0	100	0	102	80-120	0			

LCSD Sample ID: **lcsd-31695-31695** Units: **mg/Kg** Analysis Date: **10/29/2015 11:22 AM**
Client ID: Run ID: **ICP3_151029A** SeqNo: **1163040** Prep Date: **10/29/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	100.9	5.0	100	0	101	80-120	101.9	0.986	20	

MS Sample ID: **15101122-01a ms** Units: **mg/Kg** Analysis Date: **10/29/2015 11:28 AM**
Client ID: **WP-102115-SD-01 (With MS/MSD)** Run ID: **ICP3_151029A** SeqNo: **1163042** Prep Date: **10/29/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	207.8	4.7	94.32	133.5	78.8	75-125	0			

MSD Sample ID: **15101122-01a msd** Units: **mg/Kg** Analysis Date: **10/29/2015 11:30 AM**
Client ID: **WP-102115-SD-01 (With MS/MSD)** Run ID: **ICP3_151029A** SeqNo: **1163043** Prep Date: **10/29/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	228.5	4.6	92.22	133.5	103	75-125	207.8	9.5	20	

The following samples were analyzed in this batch: 15101122-01a

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 29-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
WorkOrder: **15101122**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
% of sample	
mg/Kg-dry	

ALS Environmental

Sample Receipt Checklist

Client Name: **TETRATECH-LOUISVILLE**

Date/Time Received: **23-Oct-15 10:24**

Work Order: **15101122**

Received by: **JNW**

Checklist completed by: Shiloh Greenwald (eSignature) 23-Oct-15 (Date)

Reviewed by: Shawn Smythe (eSignature) 26-Oct-15 (Date)

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on 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?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.2		
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

Ship To: ALS Environmental
4388 Glendale Milford Rd.
Cincinnati, Ohio 45242
Phone: (513) 733-5336
Fax: (513) 733-5347

Field Chain-of-Custody Record

Page __

1510 1122

Report Requested by EOB of Selected TAT
☐ 10 Wk Days ☒ 5 Wk Days ☐ 3
OH VAP: ☐ YES ☐ NO

Date: 10/22/15
Purchase Order No.:
Company Name: Tetra Tech
Project No.: 103X902702002.001F
Address: 4967 US Hwy 42, Suite 210
Sampling Site: WILEY PROPERTY
LOUISVILLE (City) KY (State) 40222 (Zip)
Person to Contact: Sherry Weedman
Billing Address (if different):
Email Address: sherry.weedman@tetratech.com
Telephone (502): 569-9067
Alternate Contact:

ALS Lab ID	Sample ID / Description	Date	Time	Preservation Key #	Sample Type / Matrix Key Abbr.	# of Sample Containers	TOTAL ARSENIC - METHOD 6010C			A
01	WP-102115-SD-01 (WITH MS/MSD) ☆	10/21/15	15:08	9	S	2	X			
02	WP-102115-SD-02	10/21/15	15:20	9	S	1	X			
03	WP-102115-SD-03	10/21/15	15:32	9	S	1	X			
04	WP-102115-SD-04	10/21/15	15:40	9	S	1	X			
05	WP-102115-SD-05	10/21/15	15:52	9	S	1	X			
06	WP-102115-SD-05-DUP	10/21/15	15:55	9	S	1	X			

Notes:

Preservation Key: 1 - HCl 2 - HNO_3 3 - H_2SO_4 4 - NaOH 5 - $Na_2S_2O_3$ 6 - $NaHSO_4$ 7 - NaOH/ZnAcetate 8 - Other 9 - 4°C

Matrix Key: A

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date
[signature]	1830 / 10/22/15	[signature]	10/22/15 1024
Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date
Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date

COOLER TEMP:
COOLING METHOD
DELIVERY METHOD
STD MAIL PR
CUSTODY SEALS:
EQUIP. RETURNED

ALS Environmental

28-Oct-2015

Sherry Weedman
Tetra Tech, Inc.
4967 Highway 42
Suite 210
Louisville, KY 40222

Tel: (502) 569-9067
Fax:

Re: Wiley Property; 103X902702002.001F

Work Order: **15101123**

Dear Sherry,

ALS Environmental received 2 samples on 23-Oct-2015 10:24 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 8.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 28-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: **15101123**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15101123-01	WP-101515-SB-01	Soil		10/15/2015 15:30	10/23/2015 10:24	☐
15101123-02	WP-101515-SB-02	Soil		10/15/2015 15:40	10/23/2015 10:24	☐

ALS Environmental

Date: 28-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101123

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101123
Sample ID: WP-101515-SB-01
Lab ID: 15101123-01
Collection Date: 10/15/2015 03:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**20**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**14,000**		**6.0**	**mg/Kg-dry**	1	10/26/2015 05:11 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101123
Sample ID: WP-101515-SB-02
Lab ID: 15101123-02
Collection Date: 10/15/2015 03:40 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**19**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**5,200**		**6.1**	**mg/Kg-dry**	1	10/26/2015 05:14 PM

Note:

ALS Environmental

Date: 28-Oct-15

Client: Tetra Tech, Inc.
Work Order: 15101123
Project: Wiley Property; 103X902702002.001F

QC BATCH REPORT

Batch ID: **31585** Instrument ID: **ICP3** Method: **SW6010B**

MBLK Sample ID: **mblk-31585-31585** Units: **mg/Kg** Analysis Date: **10/26/2015 04:27 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160914** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	5.0								

LCS Sample ID: **lcs-31585-31585** Units: **mg/Kg** Analysis Date: **10/26/2015 04:30 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160915** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	105.1	5.0	100	0	105	80-120	0			

LCSD Sample ID: **lcsd-31585-31585** Units: **mg/Kg** Analysis Date: **10/26/2015 04:33 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160916** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	103.9	5.0	100	0	104	80-120	105.1	1.15	20	

MS Sample ID: **15101029-03b ms** Units: **mg/Kg** Analysis Date: **10/26/2015 04:39 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160918** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	93.39	4.5	90.76	5.223	97.1	75-125	0			

MSD Sample ID: **15101029-03b msd** Units: **mg/Kg** Analysis Date: **10/26/2015 04:42 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160919** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	88.59	4.2	84.86	5.223	98.2	75-125	93.39	5.27	20	

The following samples were analyzed in this batch: 15101123-01a 15101123-02a

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 28-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
WorkOrder: 15101123

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
% of sample	
mg/Kg-dry	

ALS Environmental

Sample Receipt Checklist

Client Name: **TETRATECH-LOUISVILLE** Date/Time Received: **23-Oct-15 10:24**

Work Order: **15101123** Received by: **JNW**

Checklist completed by: Shiloh Greenwald (eSignature) 23-Oct-15 (Date) Reviewed by: Shawn Smythe (eSignature) 26-Oct-15 (Date)

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on 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?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.2		
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Ship To: ALS Environmental
4388 Glendale Milford Rd.
Cincinnati, Ohio 45242
Phone: (513) 733-5336
Fax: (513) 733-5347

Field Chain-of-Custody Record

Page __

1510123

Report Requested by EOB of Selected TAT
☐ 10 Wk Days ☒ 5 Wk Days ☐
OH VAP: ☐ YES ☐ NO

Date: 10/22/15
Purchase Order No.:
Company Name: Tetra Tech
Project No.: 103X902702.002.001F
Address: 4967 US HWY 42, SUITE 210
Sampling Site: WILEY PROPERTY
LOUISVILLE KY 40222
City State Zip
Person to Contact: SHERRY WEEDMAN
Billing Address (if different):
Email Address: SHERRY.WEEDMAN@TETRATECH.COM
Telephone (502): 569-9067
Alternate Contact:

ALS Lab ID	Sample ID / Description	Date	Time	Preservation Key #	Sample Type / Matrix Key Abbr.	# of Sample Containers	TOTAL ARSENIC - METHOD 6010C		
01	WP-101515-SB-01	10/15/15	1530	9	S	1	X		
02	WP-101515-SB-02	10/15/15	1540	9	S	1	X		

Notes:

Preservation Key: 1 - HCl 2 - HNO_3 3 - H_2SO_4 4 - NaOH 5 - $Na_2S_2O_3$ 6 - $NaHSO_4$ 7 - NaOH/ZnAcetate 8 - Other 9 - 4°C

Matrix Key:

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date
[signature]	10/22/15 @ 1730	[signature]	10/23/15 1024
Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date
Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date

COOLER TEMP:
COOLING METHOD
DELIVERY METHOD
STD MAIL PF
CUSTODY SEALS:
EQUIP. RETURNED

ALS Environmental

28-Oct-2015

Sherry Weedman
Tetra Tech, Inc.
4967 Highway 42
Suite 210
Louisville, KY 40222

Tel: (502) 569-9067
Fax:

Re: Wiley Property; 103X902702002.001F

Work Order: **15101124**

Dear Sherry,

ALS Environmental received 20 samples on 23-Oct-2015 10:24 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 28.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 28-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: **15101124**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
15101124-01	WP-102115-SF-01	Soil		10/21/2015 14:40	10/23/2015 10:24	☐
15101124-02	WP-102115-SF-02	Soil		10/21/2015 17:09	10/23/2015 10:24	☐
15101124-03	WP-102115-SF-02-DUP	Soil		10/21/2015 17:12	10/23/2015 10:24	☐
15101124-04	WP-102115-SF-03	Soil		10/21/2015 17:15	10/23/2015 10:24	☐
15101124-05	WP-102115-SF-04	Soil		10/21/2015 17:18	10/23/2015 10:24	☐
15101124-06	WP-102115-SF-05	Soil		10/21/2015 17:22	10/23/2015 10:24	☐
15101124-07	WP-102115-SF-06	Soil		10/21/2015 17:25	10/23/2015 10:24	☐
15101124-08	WP-102115-SF-07	Soil		10/21/2015 17:27	10/23/2015 10:24	☐
15101124-09	WP-102115-SF-08	Soil		10/21/2015 17:30	10/23/2015 10:24	☐
15101124-10	WP-102115-SF-09	Soil		10/21/2015 17:33	10/23/2015 10:24	☐
15101124-11	WP-102115-SF-10	Soil		10/21/2015 17:39	10/23/2015 10:24	☐
15101124-12	WP-102115-SF-11 (With MS/MSD)	Soil		10/21/2015 17:51	10/23/2015 10:24	☐
15101124-13	WP-102115-SF-12	Soil		10/21/2015 17:54	10/23/2015 10:24	☐
15101124-14	WP-102115-SF-13	Soil		10/21/2015 17:58	10/23/2015 10:24	☐
15101124-15	WP-102115-SF-14	Soil		10/21/2015 18:01	10/23/2015 10:24	☐
15101124-16	WP-102115-SF-15	Soil		10/21/2015 18:04	10/23/2015 10:24	☐
15101124-17	WP-102115-SF-16	Soil		10/21/2015 18:06	10/23/2015 10:24	☐
15101124-18	WP-102115-SF-17	Soil		10/21/2015 18:09	10/23/2015 10:24	☐
15101124-19	WP-102115-SF-18	Soil		10/21/2015 18:18	10/23/2015 10:24	☐
15101124-20	WP-102115-SF-19	Soil		10/21/2015 18:22	10/23/2015 10:24	☐

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-01
Collection Date: 10/21/2015 02:40 PM

Work Order: 15101124
Lab ID: 15101124-01
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**15**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**76**		**5.7**	**mg/Kg-dry**	1	10/26/2015 03:52 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-02
Collection Date: 10/21/2015 05:09 PM

Work Order: 15101124
Lab ID: 15101124-02
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**28**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**7,200**		**6.4**	**mg/Kg-dry**	1	10/26/2015 03:55 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-02-DUP
Collection Date: 10/21/2015 05:12 PM

Work Order: 15101124
Lab ID: 15101124-03
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**28**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**6,000**		**6.2**	**mg/Kg-dry**	1	10/26/2015 03:58 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-03
Collection Date: 10/21/2015 05:15 PM

Work Order: 15101124
Lab ID: 15101124-04
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**28**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**31,000**		**64**	**mg/Kg-dry**	10	10/26/2015 04:24 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-04
Collection Date: 10/21/2015 05:18 PM

Work Order: 15101124
Lab ID: 15101124-05
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**21**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**2,700**		**5.7**	**mg/Kg-dry**	1	10/26/2015 04:04 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-05
Collection Date: 10/21/2015 05:22 PM

Work Order: 15101124
Lab ID: 15101124-06
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**11**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**1,400**		**5.3**	**mg/Kg-dry**	1	10/26/2015 04:07 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-06
Collection Date: 10/21/2015 05:25 PM

Work Order: 15101124
Lab ID: 15101124-07
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**7.8**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**93**		**5.3**	**mg/Kg-dry**	1	10/26/2015 04:09 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-07
Lab ID: 15101124-08
Collection Date: 10/21/2015 05:27 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**19**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**960**		**6.2**	**mg/Kg-dry**	1	10/26/2015 04:12 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-08
Lab ID: 15101124-09
Collection Date: 10/21/2015 05:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**12**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/23/2015**	Analyst: **VAW**
Arsenic	**67**		**5.3**	**mg/Kg-dry**	1	10/26/2015 04:21 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-09
Collection Date: 10/21/2015 05:33 PM

Work Order: 15101124
Lab ID: 15101124-10
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**32**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**1,500**		**6.9**	**mg/Kg-dry**	1	10/26/2015 05:17 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-10
Collection Date: 10/21/2015 05:39 PM

Work Order: 15101124
Lab ID: 15101124-11
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**7.6**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**1,400**		**4.7**	**mg/Kg-dry**	1	10/26/2015 05:20 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-11 (With MS/MSD)
Lab ID: 15101124-12
Collection Date: 10/21/2015 05:51 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**12**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/28/2015**	Analyst: **VAW**
Arsenic	**140**		**5.0**	**mg/Kg-dry**	1	10/28/2015 11:29 AM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-12
Lab ID: 15101124-13
Collection Date: 10/21/2015 05:54 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**15**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**910**		**5.7**	**mg/Kg-dry**	1	10/26/2015 05:22 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-13
Lab ID: 15101124-14
Collection Date: 10/21/2015 05:58 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**18**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**63**		**5.6**	**mg/Kg-dry**	1	10/26/2015 05:25 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Work Order: 15101124
Sample ID: WP-102115-SF-14
Lab ID: 15101124-15
Collection Date: 10/21/2015 06:01 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**15**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**300**		**5.5**	**mg/Kg-dry**	1	10/26/2015 05:28 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-15
Collection Date: 10/21/2015 06:04 PM

Work Order: 15101124
Lab ID: 15101124-16
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**21**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**4,700**		**6.3**	**mg/Kg-dry**	1	10/26/2015 05:37 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-16
Collection Date: 10/21/2015 06:06 PM

Work Order: 15101124
Lab ID: 15101124-17
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**20**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**2,300**		**6.0**	**mg/Kg-dry**	1	10/26/2015 05:40 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-17
Collection Date: 10/21/2015 06:09 PM

Work Order: 15101124
Lab ID: 15101124-18
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**18**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**2,000**		**6.1**	**mg/Kg-dry**	1	10/26/2015 05:43 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-18
Collection Date: 10/21/2015 06:18 PM

Work Order: 15101124
Lab ID: 15101124-19
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**12**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**210**		**5.0**	**mg/Kg-dry**	1	10/26/2015 05:45 PM

Note:

ALS Environmental

Date: *28-Oct-15*

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
Sample ID: WP-102115-SF-19
Collection Date: 10/21/2015 06:22 PM

Work Order: 15101124
Lab ID: 15101124-20
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE			**SM2540B**		Prep Date: **10/26/2015**	Analyst: **DNS**
Moisture	**18**			**% of sample**	1	10/27/2015
METALS BY ICP			**SW6010B**		Prep Date: **10/26/2015**	Analyst: **VAW**
Arsenic	**68**		**5.7**	**mg/Kg-dry**	1	10/26/2015 05:48 PM

Note:

ALS Environmental

Client: Tetra Tech, Inc.
Work Order: 15101124
Project: Wiley Property; 103X902702002.001F

Date: 28-Oct-15

QC BATCH REPORT

Batch ID: **31550** Instrument ID: **ICP3** Method: **SW6010B**

MBLK Sample ID: **mblk-31550-31550**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160888** Analysis Date: **10/26/2015 02:52 PM** Prep Date: **10/23/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	5.0								

LCS Sample ID: **lcs-31550-31550**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160889** Analysis Date: **10/26/2015 02:55 PM** Prep Date: **10/23/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	103	5.0	100	0	103	80-120	0			

LCSD Sample ID: **lcsd-31550-31550**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160890** Analysis Date: **10/26/2015 02:58 PM** Prep Date: **10/23/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	102.2	5.0	100	0	102	80-120	103	0.78	20	

MS Sample ID: **15101030-02b ms**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160892** Analysis Date: **10/26/2015 03:10 PM** Prep Date: **10/23/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	93.04	4.4	88.53	4.77	99.7	75-125	0			

MSD Sample ID: **15101030-02b msd**
Client ID: Run ID: **ICP3_151026C** Units: **mg/Kg** SeqNo: **1160893** Analysis Date: **10/26/2015 03:13 PM** Prep Date: **10/23/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	90.1	4.4	87.31	4.77	97.7	75-125	93.04	3.21	20	

The following samples were analyzed in this batch:

15101124-01a	15101124-02a	15101124-03a
15101124-04a	15101124-05a	15101124-06a
15101124-07a	15101124-08a	15101124-09a

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Tetra Tech, Inc.
Work Order: 15101124
Project: Wiley Property; 103X902702002.001F

QC BATCH REPORT

Batch ID: **31585** Instrument ID: **ICP3** Method: **SW6010B**

MBLK Sample ID: **mblk-31585-31585** Units: **mg/Kg** Analysis Date: **10/26/2015 04:27 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160914** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	5.0								

LCS Sample ID: **lcs-31585-31585** Units: **mg/Kg** Analysis Date: **10/26/2015 04:30 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160915** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	105.1	5.0	100	0	105	80-120	0			

LCSD Sample ID: **lcsd-31585-31585** Units: **mg/Kg** Analysis Date: **10/26/2015 04:33 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160916** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	103.9	5.0	100	0	104	80-120	105.1	1.15	20	

MS Sample ID: **15101029-03b ms** Units: **mg/Kg** Analysis Date: **10/26/2015 04:39 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160918** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	93.39	4.5	90.76	5.223	97.1	75-125	0			

MSD Sample ID: **15101029-03b msd** Units: **mg/Kg** Analysis Date: **10/26/2015 04:42 PM**
Client ID: Run ID: **ICP3_151026C** SeqNo: **1160919** Prep Date: **10/26/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	88.59	4.2	84.86	5.223	98.2	75-125	93.39	5.27	20	

The following samples were analyzed in this batch:

15101124-10a	15101124-11a	15101124-13a
15101124-14a	15101124-15a	15101124-16a
15101124-17a	15101124-18a	15101124-19a
15101124-20a		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Tetra Tech, Inc.
Work Order: 15101124
Project: Wiley Property; 103X902702002.001F

QC BATCH REPORT

Batch ID: **31675** Instrument ID: **ICP3** Method: **SW6010B**

MBLK Sample ID: **mblk-31675-31675** Units: **mg/Kg** Analysis Date: **10/28/2015 10:45 AM**
Client ID: Run ID: **ICP3_151028B** SeqNo: **1162152** Prep Date: **10/28/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	5.0								

LCS Sample ID: **lcs-31675-31675** Units: **mg/Kg** Analysis Date: **10/28/2015 10:48 AM**
Client ID: Run ID: **ICP3_151028B** SeqNo: **1162153** Prep Date: **10/28/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	107.6	5.0	100	0	108	80-120	0			

LCSD Sample ID: **lcsd-31675-31675** Units: **mg/Kg** Analysis Date: **10/28/2015 10:51 AM**
Client ID: Run ID: **ICP3_151028B** SeqNo: **1162154** Prep Date: **10/28/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	107.7	5.0	100	0	108	80-120	107.6	0.0929	20	

MS Sample ID: **15101124-12a ms** Units: **mg/Kg** Analysis Date: **10/28/2015 11:32 AM**
Client ID: **WP-102115-SF-11 (With MS/MSD)** Run ID: **ICP3_151028B** SeqNo: **1162166** Prep Date: **10/28/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	245	4.5	90.25	122.8	135	75-125	0			S

MSD Sample ID: **15101124-12a msd** Units: **mg/Kg** Analysis Date: **10/28/2015 11:35 AM**
Client ID: **WP-102115-SF-11 (With MS/MSD)** Run ID: **ICP3_151028B** SeqNo: **1162167** Prep Date: **10/28/2015** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	220.3	4.3	86.58	122.8	113	75-125	245	10.6	20	

The following samples were analyzed in this batch: 15101124-12a

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 28-Oct-15

Client: Tetra Tech, Inc.
Project: Wiley Property; 103X902702002.001F
WorkOrder: **15101124**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
% of sample	
mg/Kg-dry	

ALS Environmental

Sample Receipt Checklist

Client Name: **TETRATECH-LOUISVILLE** Date/Time Received: **23-Oct-15 10:24**

Work Order: **15101124** Received by: **JNW**

Checklist completed by: Shiloh Greenwald (eSignature) 23-Oct-15 (Date) Reviewed by: Shawn Smythe (eSignature) 26-Oct-15 (Date)

Matrices:
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on 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?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.2		
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Ship To: ALS Environmental
4388 Glendale Milford Rd.
Cincinnati, Ohio 45242
Phone: (513) 733-5336
Fax: (513) 733-5347

Field Chain-of-Custody Record

Page __

1510124

Report Requested by EOB of Selected TAT
☐ 10 Wk Days ☒ 5 Wk Days ☐
OH VAP: ☐ YES ☐ NO

Date: 10/22/15
Purchase Order No.:
Company Name: TETRA TECH
Project No.: 103X902702002.001F
Address: 4967 US HWY 42, SUITE 210
Sampling Site: WILEY PROPERTY
LOUISVILLE KY 40222
City State Zip
Person to Contact: SHERRY WEEDMAN
Billing Address (if different):
Email Address: SHERRY.WEEDMAN@TETRATECH.COM
Telephone (502): 569-9067
Alternate Contact:

ALS Lab ID	Sample ID / Description	Date	Time	Preservation Key #	Sample Type / Matrix Key Abbr.	# of Sample Containers	TOTAL ARSENIC - METHOD 6010C		
01	WP-102115-SF-01	10/21/15	~~15:20~~ 14:40 PP	9	S	1	X		
02	WP-102115-SF-02	↓	17:09	↓	↓	↓	X		
03	WP-102115-SF-02-DUP	↓	17:12	↓	↓	↓	X		
04	WP-102115-SF-03	↓	17:15	↓	↓	↓	X Note: High AC		
05	WP-102115-SF-04	↓	17:18	↓	↓	↓	X		
06	WP-102115-SF-05	↓	17:22	↓	↓	↓	X		
07	WP-102115-SF-06	↓	17:25	↓	↓	↓	X		
08	WP-102115-SF-07	↓	17:27	↓	↓	↓	X		
09	WP-102115-SF-08	↓	17:30	↓	↓	↓	X		
10	WP-102115-SF-09	↓	17:33	↓	↓	↓	X		

Notes:

Preservation Key: 1 - HCl 2 - HNO_3 3 - H_2SO_4 4 - NaOH 5 - $Na_2S_2O_3$ 6 - $NaHSO_4$ 7 - NaOH/ZnAcetate 8 - Other 9 - 4°C

Matrix Key:

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date
	1830 / 10/22/15		10/22/15 1022
Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date
Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date

COOLER TEMP:
COOLING METHOD
DELIVERY METHOD
STD MAIL PR
CUSTODY SEALS:
EQUIP. RETURNED

Ship To: ALS Environmental
4388 Glendale Milford Rd.
Cincinnati, Ohio 45242
Phone: (513) 733-5336
Fax: (513) 733-5347

Field Chain-of-Custody Record

Page 4

1510 1124

Report Requested by EOB of Selected TAT
☐ 10 Wk Days ☒ 5 Wk Days ☐
OH VAP: ☐ YES ☐ NO

Date: 10/22/15
Purchase Order No.:
Company Name: TETRA TECH
Project No.: 103X902702002.001F
Address: 4967 US HWY 42, SUITE 210
Sampling Site: WILEY PROPERTY
LOUISVILLE KY 40222
City State Zip
Person to Contact: SHERRY WEEDMAN
Billing Address (if different):
Email Address: SHERRY.WEEDMAN@TETRATECH.COM
Telephone (502): 569-9067
Alternate Contact:

ALS Lab ID	Sample ID / Description	Date	Time	Preservation Key #	Sample Type / Matrix Key Abbr.	# of Sample Containers	METHOD 6010C - TOTAL ARSENIC		
11	WP-102115-SF-10	10/21/15	17:39	9	S	1	X		
12	WP-102115-SF-11 (WITH MS/MSD)		17:51			2	X		
13	WP-102115-SF-12		17:54			1	X		
14	WP-102115-SF-13		17:58			1	X		
15	WP-102115-SF-14		18:01			1	X		
16	WP-102115-SF-15		18:04			1	X		
17	WP-102115-SF-16		18:06			1	X		
18	WP-102115-SF-17		18:09			1	X		
19	WP-102115-SF-18		18:18			1	X		
20	WP-102115-SF-19		18:22			1	X		

Notes:

Preservation Key: 1 - HCl 2 - HNO_3 3 - H_2SO_4 4 - NaOH 5 - $Na_2S_2O_3$ 6 - $NaHSO_4$ 7 - NaOH/ZnAcetate 8 - Other 9 - 4°C

Matrix Key: A

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date
	1830 / 10/23/15		10/23/15 1830
Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date
Relinquished By: (Signature)	Time / Date	Received By: (Signature)	Time / Date

COOLER TEMP:
COOLING METHOD
DELIVERY METHOD
STD MAIL PR
CUSTODY SEALS:
EQUIP. RETURNED:

ATTACHMENT 2

KENTUCKY DEPARTMENT FOR ENVIROMENTAL PROTECTION REFERRAL MATERIALS

(42 Pages)

ENERGY AND ENVIRONMENT CABINET

Steven L. Beshear
Governor

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-2150
FAX (502) 564-4245
www.dep.ky.gov

Leonard K. Peters
Secretary

R. Bruce Scott
Commissioner

MEMORANDUM

TO: Jim McGuire, Removal Manager
Emergency Response and Removal Branch, EPA Region 4

Art Smith, On-Scene Coordinator
EPA Region 4

FROM: Larry D. Hughes, Registered Geologist Branch Manager
Superfund Branch, Kentucky Division of Waste Management (KDWM)

DATE: November 14, 2014

SUBJECT: Request for Time Critical Removal Action
AI# 124089 Wiley Property
Incident # 2381255
209 Shinkle Chapel Rd
Hartford, Ohio County, Kentucky
Latitude: 37.51
Longitude: -86.964722

The KDWM requests that EPA Region 4 take a time-critical removal action at the above reference property in Ohio County, Kentucky. Extraordinarily high levels of arsenic contaminants were identified in the surface soils during two November 2014 reconnaissance and sampling events (10/2/14 and 10/22/14) conducted by the division's Field Operations Branch (FOB). The field reconnaissance and sampling events were based on an original complaint by [redacted] (b)(6) Personal Privacy assigned on 8/26/14 and with initial investigation activities commencing on 9/25/14. The previous property owner was identified as [redacted] (b)(6) Personal Privacy The initial analytical findings concluded that there are extraordinary concentrations of arsenic present in the surface soils and are also likely at depth and in the surrounding area. These findings require a time-critical action that the Commonwealth of Kentucky is not does not have the resources to conduct to conduct at this time.

Site Investigatory, Reconnaissance and Initial Analytical Findings and History

The Division received a complaint which was forwarded to the Regional Office for investigation. The Complainant indicated that from December of 2008 until November of 2013 she had lived on a 10 acre lot located at 209 Shinkle Chapel Rd near Hartford, Kentucky in Ohio County. The complainant stated that, "...at some point, prior to her living there, a portion of the property was used as a disposal site for some unknown materials. The materials were reportedly kept in a pole barn, which at some point burned to the ground." Little to no vegetation was growing around the disposal area and it was reported that an above ground storage tank was on the property with a white powdery substance around the tank. The Complainant indicated that they bred labradoodles while living on property (approximately 60) and that all the females were sterile and multiple dogs suffered from tumors. The complainant was concerned for her daughter that lived with her on the property at the time who is now 16 years old. The complainant also indicated that Wells Fargo bank now owned the property.

An initial investigation was conducted on 9/25/14 identifying a visible white residue in a circular area approximately 30 feet in diameter. Easily identifiable dead vegetation was observed immediately down gradient in an ephemeral drainage feature up to approximately 75+ feet. This area of Ohio County is in an oil production zone and Google Earth images appeared to indicate roads in the wooded area in a radius pattern indicative of crude oil production. Subsequent historic aerial maps dating back to the 50s and 70s also indicate what appears to be an orchard feature immediately to the east of the site.

After the initial investigation the complainant was contacted by the division's FOB to obtain additional information. The complainant indicated that she saw 2 large tanks next the Shinkle Chapel Road near her old driveway. The complainant also said that they were told of an old barn that had been on the area now assumed to be the primary source zone, and that it had burned down with possible chemical containers inside. The complainant further indicated that years ago someone let a chemical company store materials in the now burned down barn. The decision was made by the division's FOB to collect samples for VOC's, Chlorides, total metals, and RCRA 8 metals and PAHs. This event took place on 10/2/14. These initial samples were collected from four locations within the identified primary source zone. The laboratory immediately contacted the division's FOB via email inquiring about sample locations due to their concern about the exceedingly high levels of arsenic.

The division's FOB branch manager immediately contacted the division's superfund branch manager regarding the information collected. A decision was made to conduct a second sample collection event of surface soils in the visibly distressed and further down gradient ephemeral stream zone. This event was conducted on 10/22/14. During this event a PVA record and deed search was conducted. The second sampling event analysis was expanded to include herbicides and pesticides. Samples were collected from the down gradient zone and one up gradient area approaching the former occupied residence. During this even

two aged, dilapidated, industrial design above ground tanks containing a white substance were identified at a location removed from the residence (Latitude 37° 30′ 55″, Longitude -86° 58′ 09″). This substance was not sampled during this event.

The findings of the Division's FOB reconnaissance, sampling and subsequent analytical data are that extraordinary concentrations of arsenic are present in the surface soil ranging from 458 to 525,000 and averaging 129,502 ppm (mg/Kg) in the identified primary source zone; ranging from 4,080 to 167,000 and averaging 150,605 ppm (mg/Kg) in the identified immediate linear downgradient drainage feature. These extraordinary arsenic levels in the surface soils were sampled as far downgradient as 120+ feet. One background grab sample, based on visual topography moving toward the former residence, was collected and analyzed. The arsenic levels for this sample were found to be 51 ppm. TCLP analysis was conducted on four of the original 10/2/14 samples collected from the primary source zone - samples A = 361,000, B = 525,000, C = 195,000 & D = 58,000 ppm – and correlated at 246, 618, 385 & 51.4 respectively.

The full nature and extent of the extraordinary arsenic concentrations have not yet been identified concerning its full lateral/aerial and vertical soil extent, nor any potential groundwater impacts. The primary source zone is the immediate source head for an ephemeral stream channel that feeds an intermittent stream channel which finally feeds into a perennial blue line stream.

Site Location

The site is located in Ohio County at 209 Shinkle Chapel Road, Hartford, Kentucky (Latitude: 37.51 Longitude: -86.964722). The residence and primary source zone is located on a 10 acre parcel currently owned by Wells Fargo bank. The immediate and surrounding area is rural, wooded and agricultural.

CERCLA History

No CERCLA history has existed at this site prior to the division's FOB investigation.

Pathways

The soil exposure pathway is the most immediate identifiable pathway of concern. The full extent of this release has not been identified. The groundwater migration pathway was not identified as a concern due to insufficient targets and data. The surface water and sediment transport pathway has been initially identified by readily available maps but has not been analytically evaluated. The air migration pathway was not evaluated other than for on-site workers during sampling events who could be exposed due to particulates when the ground is disturbed. At present the site and residence is abandoned with no fencing or gates to prevent vehicular or pedestrian access. No further evaluation of pathways has been made to date.

Conclusions and Recommendations

Due extraordinarily high levels of arsenic identified in the surface soils, KDWM recommends that EPA conduct time-critical removal actions at the site and that off-site soil sampling and product sampling be conducted at the area where the two above ground tanks containing a white substance were identified. In addition further delineation is recommended to quantify and define the lateral/aerial, subsurface soil vertical extent. Groundwater sampling is recommended due to the extraordinary levels of arsenic found and the silty-sand composition of the soils in the area. While no groundwater users were identified in the area using the Kentucky Geological Survey's data base registry and no homes were readily identifiable using aerial maps, due to its limitations, groundwater use survey of a potential radius should be considered. Furthermore, an on-site domestic use well, indicated as no longer used, exists at the residence and may pose a viable pathway for future years.

KDWM has deemed this a priority site based upon the arsenic concentrations, volume, and exposure potentials; your consideration is appreciated.

e-Attachments:

Complainant: Summary
Analytical: Summary Table
Maps: Site Sketch, Summary Geology, Soil, Historic Aerial
PVA: Deeds, Ownership Information, Ownership Map
Power Point: PPT of site and findings to date

c: Tony Hatton, P.G. Director KDWM
Tim Hubbard, P.G. Asst. Director KDWM
Larry Hughes, P.G. Branch Manger Superfund Branch, KDWM
Cliff Hall, P.G. State Lead Section Supervisor, Superfund Branch, KDWM
Sheri Adkins, P.G. Federal Section Supervisor, Superfund Branch KDWM
Eric Brown, State Lead Section Project Manager, Superfund Branch KDWM

KY Dept. for Environmental Protec
Division of Waste Management

BGRO Arsenic Complaint-TEMPO#2383199, AI

November 2014

Department for Environmental Protection
Energy and Environment Cabinet

To Protect and Enhance Kentucky's Environment

Kentucky
UNBRIDLED SPIRIT

Complaint Description as receive

- Division received a complaint and forwarded to th Regional Office for investigation

- Complainant stated that from Dec 2008 until Nov 2013 she 10 acre plot located at ***2709 Shinkle Castle Rd*** in Hartford, County)

- After further investigation, the site was determined to be located at 209 Shinkle Chapel Rd near Hartford

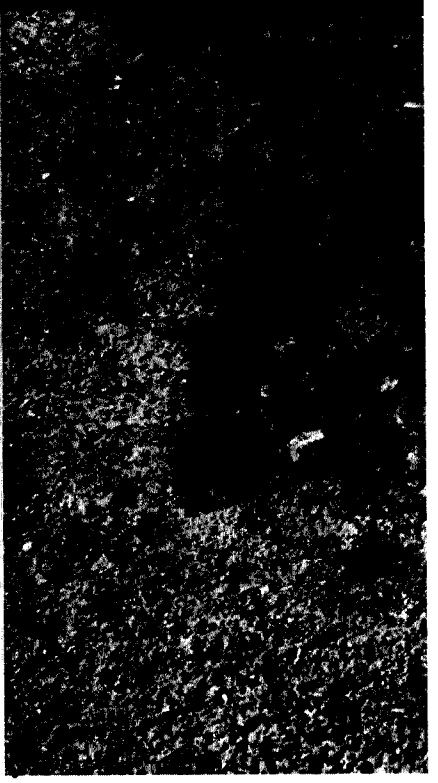
Kent
UNBRIDLE

Complainant Description as received

- Complainant stated "that at some point, prior to her living t portion of the property was used as a disposal site for some materials. The materials were reportedly kept in a pole bar some point burned to the ground."
  - Little to no vegetation growing around the disposal area.
  - Reported an above ground storage tank on property with a powdery substance around the tank.
  - Complainant bred labradoodles while living on property (a 60)
    - » Females were sterile & multiple dogs suffered from tumors
  - Concerned for her now 16 year old daughter who lived on
- Complainant also stated that Wells Fargo now owned the p

Kent
UNBRIDLE

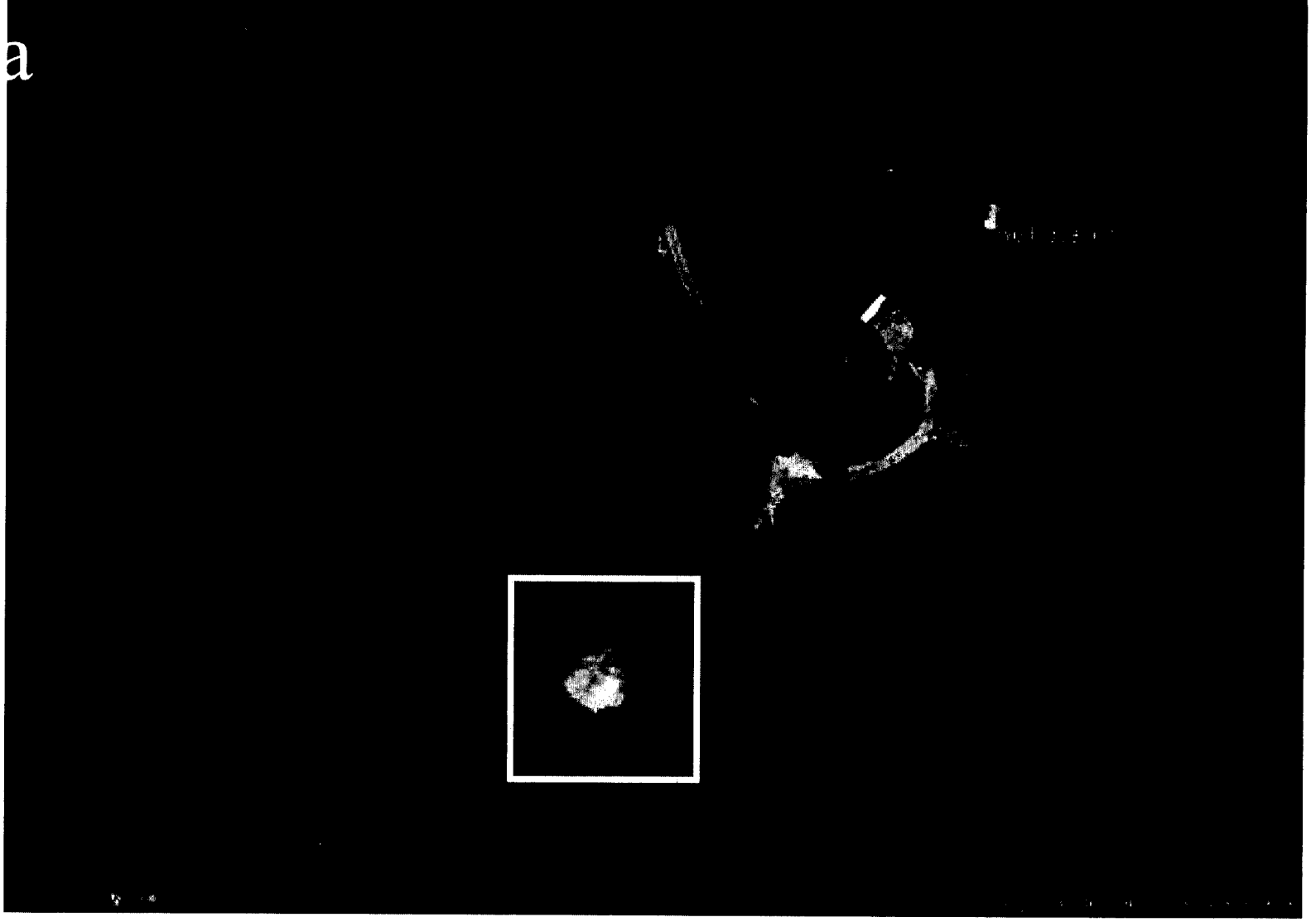
Investigation Process



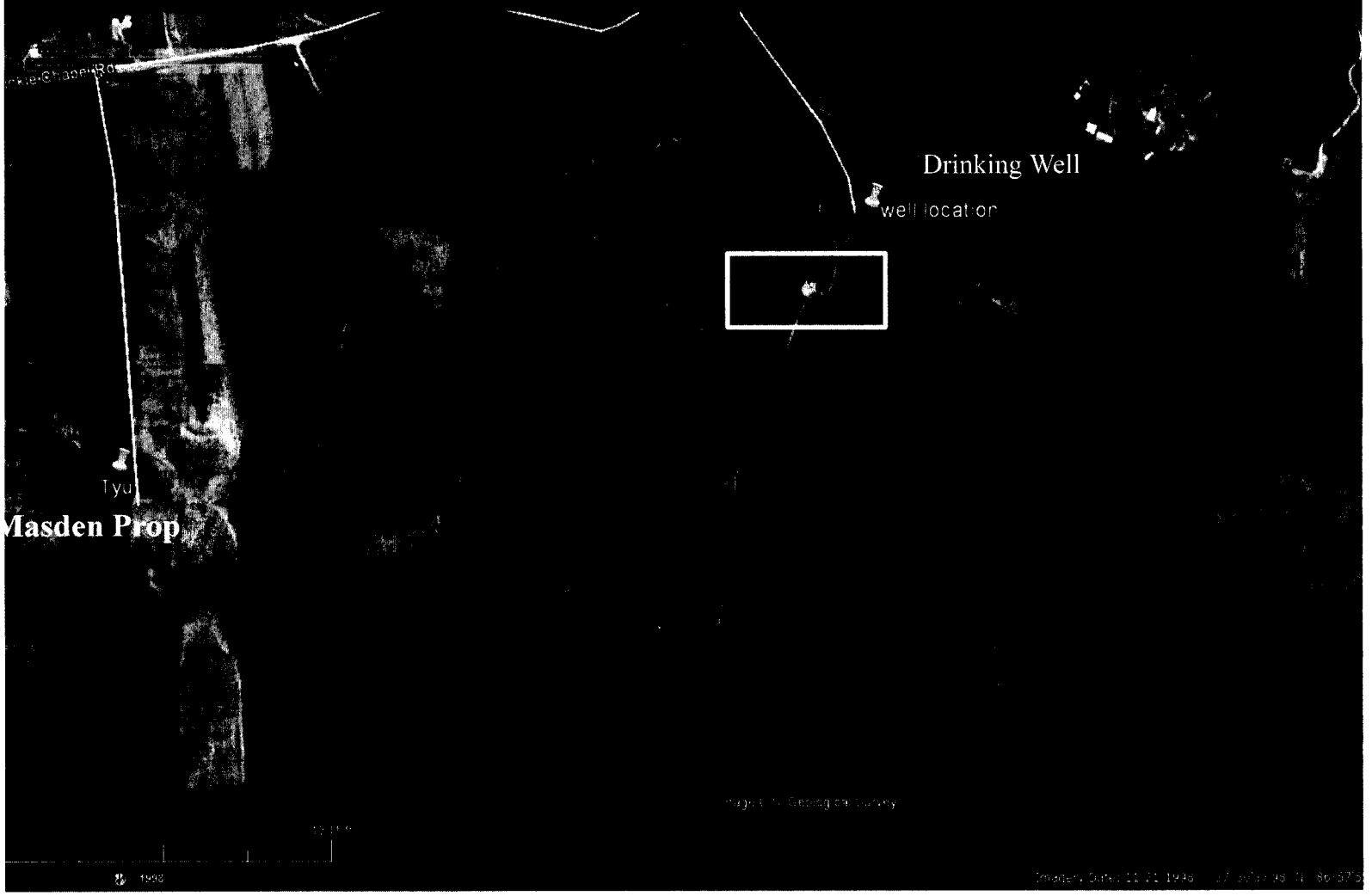
- Initial investigation conducted 09/25/14
  - White residue visible ~25' x 30'
    - Resembled a site where an old crude oil tank battery previously staged
    - Complainant previously mentioned aboveground tank
  - Dead vegetation observed down gradient
- This area of Ohio County in an oil production zone
- Google Earth images reviewed appeared to have roads into wooded area in a radius pattern indicative of crude oil prod

Google Earth Image (10/7/1

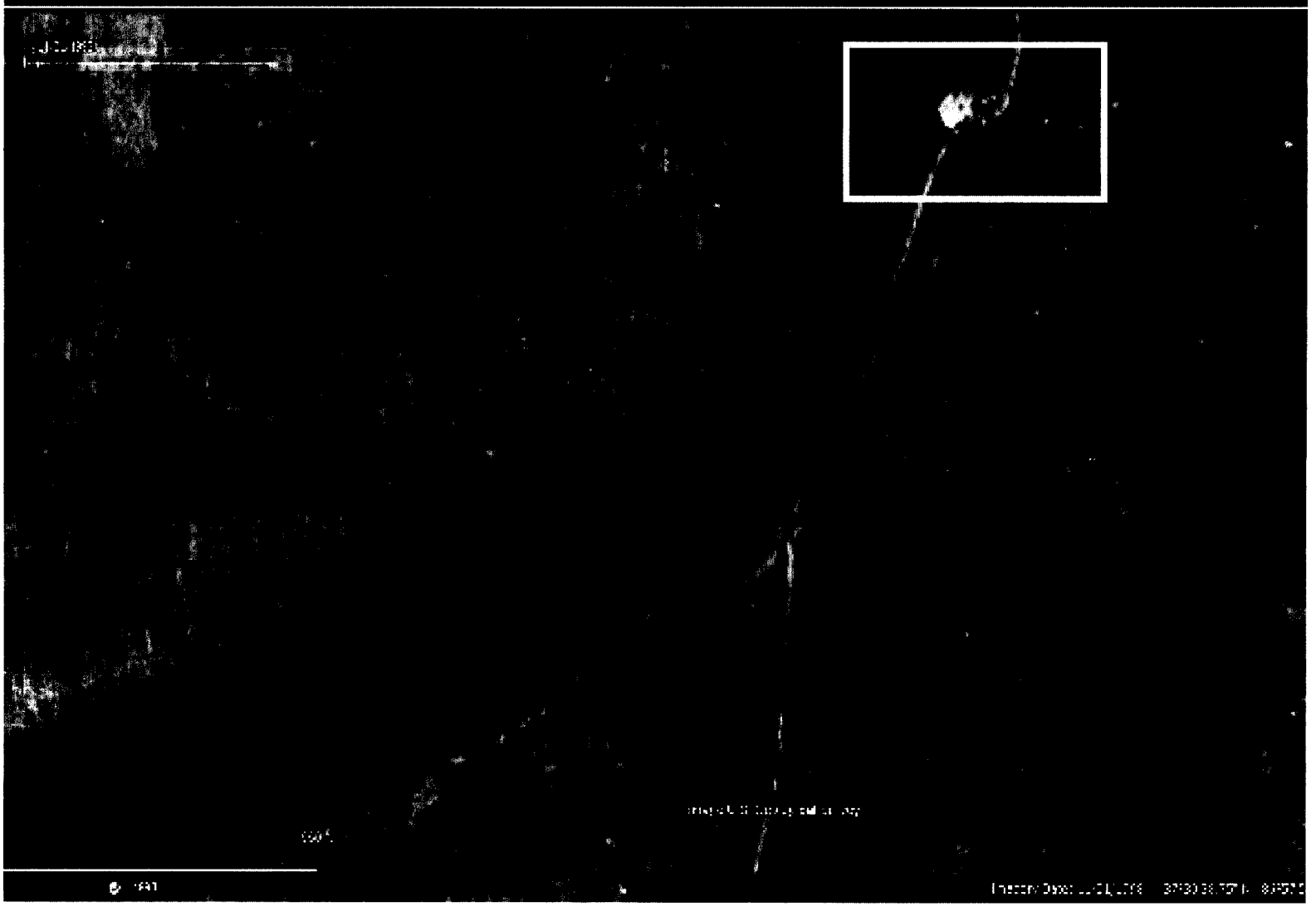
a



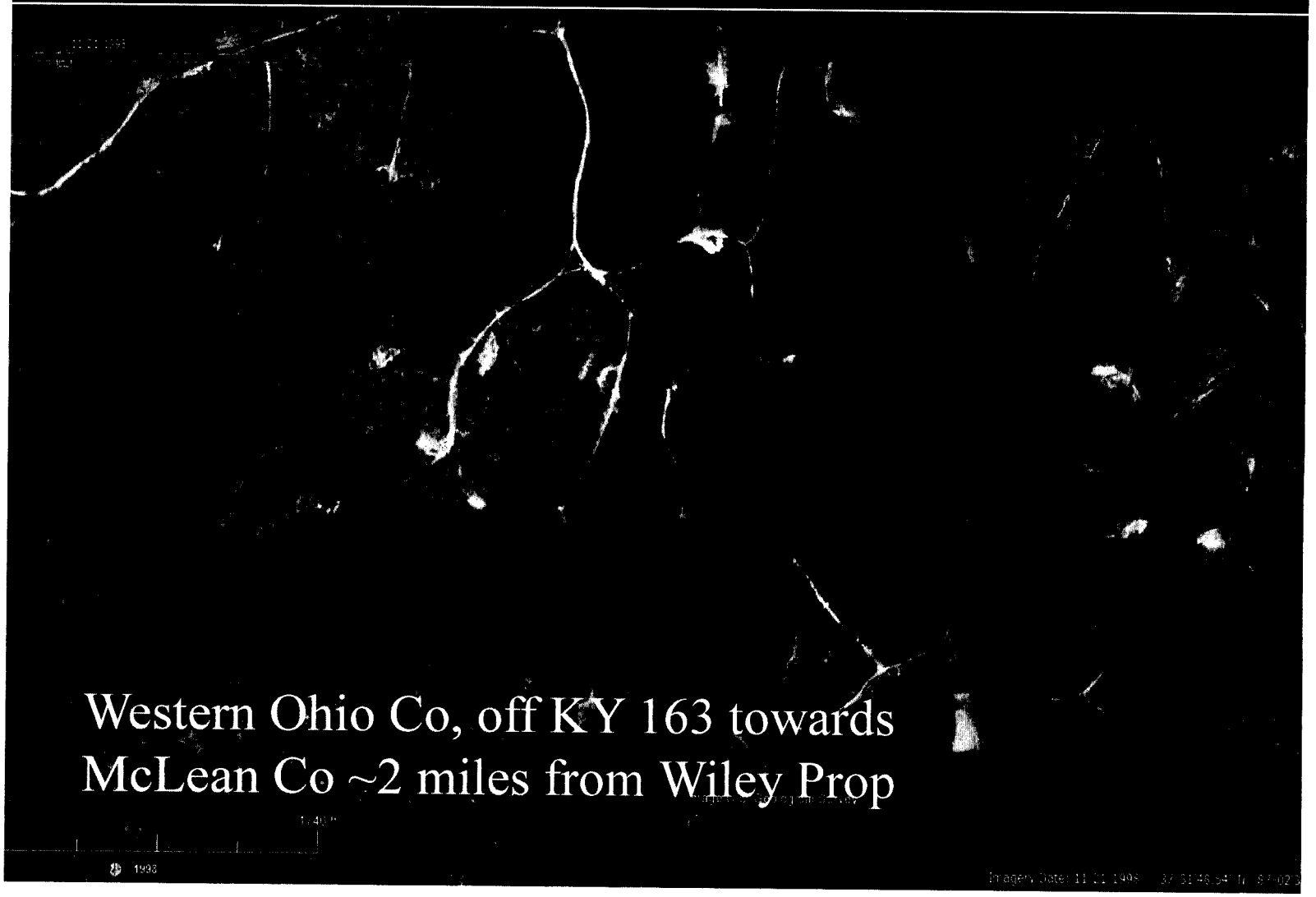
Shinkle Chapel 1998



Google Earth Image (11/21/9



Oil Well Example



Contact with the Complainant and Neig

- After initial investigation complainant was called to ob additional information
  - She stated she saw 2 large tanks next the Shinkle Chape her driveway
  - *She advised that she was told an old barn had been on t was burned down with possible chemical containers ins waste or product may have been in drums. Years ago s a chemical company store materials in the now burned*
- The decision was made by BGRO to collect samples fo Chlorides, total metals, and TCLP metals, PAHs
- Contact made with previous property owner who didn' what dead area was but it was there when he bought pr

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Initial Sampling (10/2/14)

- Samples collected samples from four locatio
  - Analysis for Chlorides, TCLP metals, Total Me VOCs, and PAHs
  - Finals were only TCLP and Totals
    - Lab employee exposure risk was a concern

- Samples shipped to Environmental Services

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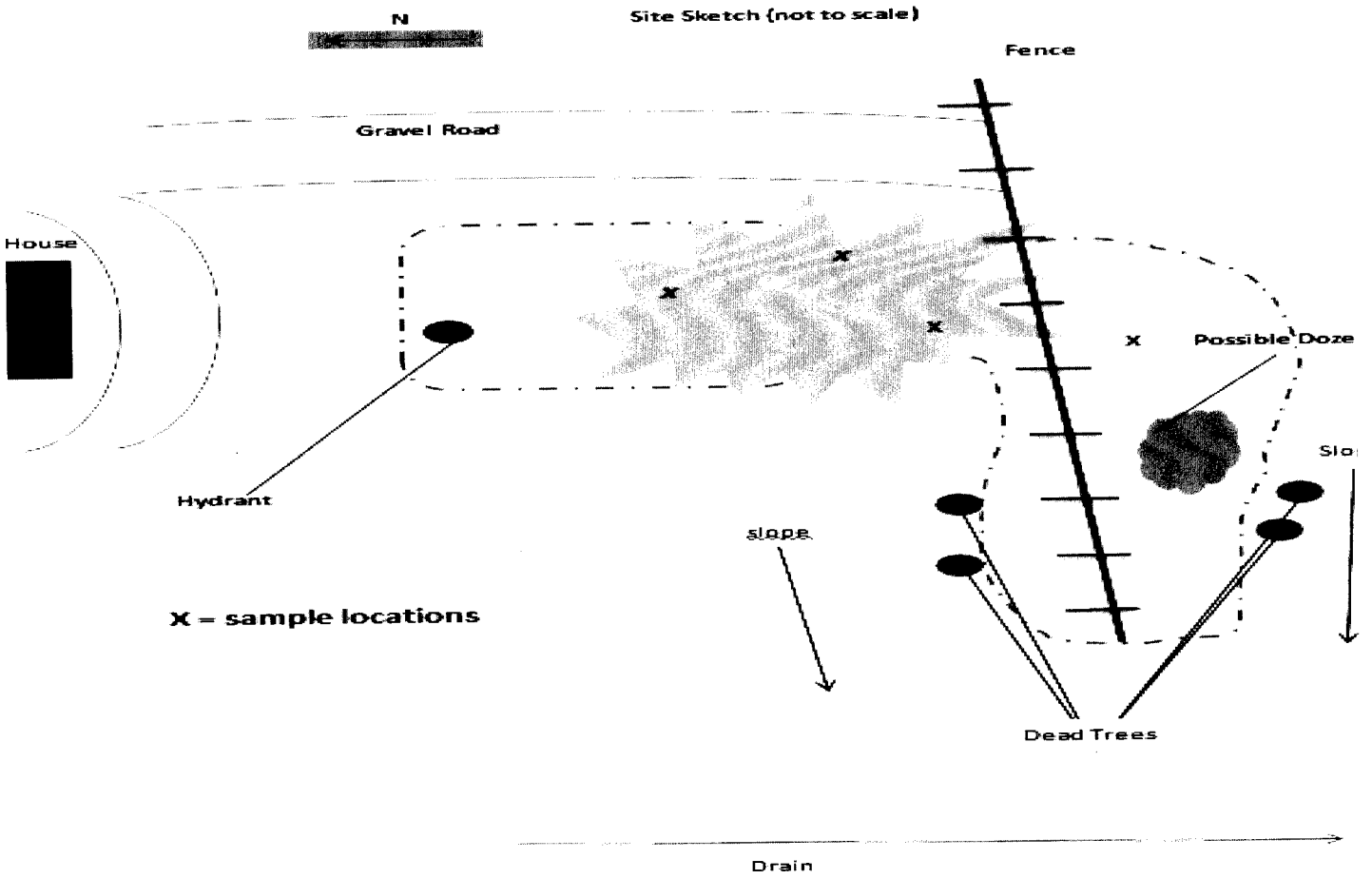
Initial Sampling Location 10/2/14



LABORATORY RESULTS

- Lab contacted BGRO via email inquiring ab
sample locations
  - Concerned about high levels of arsenic

- Preliminary results (total metals & TCLP):
  - **Sample A—arsenic 361,000 ppm, 246 ppm**
  - **Sample B—arsenic 525,000 ppm, 618 ppm**
  - **Sample C—arsenic 195,000 ppm, 385 ppm**
  - **Sample D—arsenic 58,000 ppm, 51.4 ppm**

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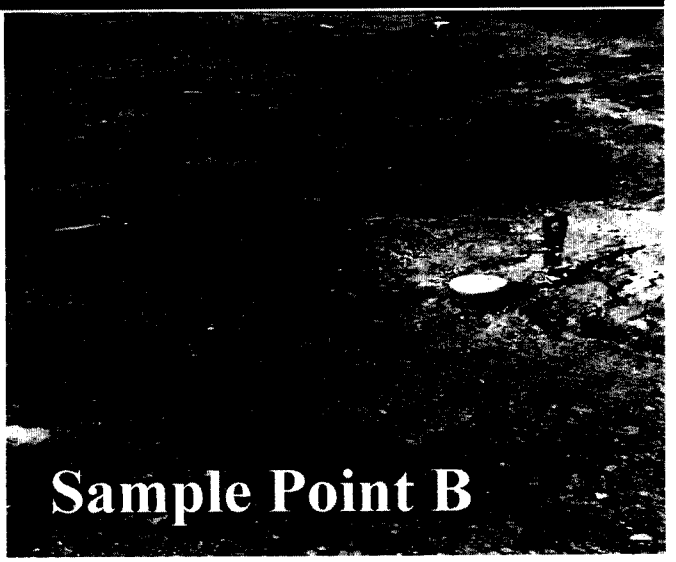
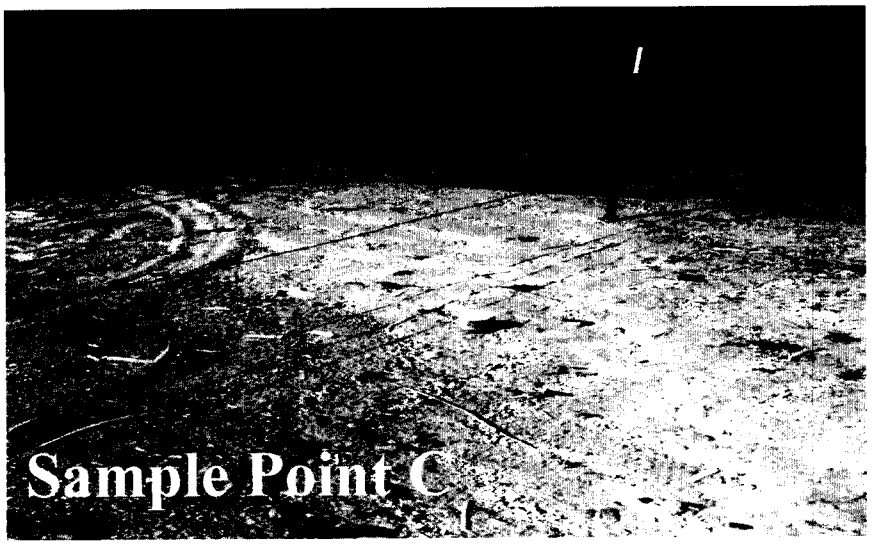
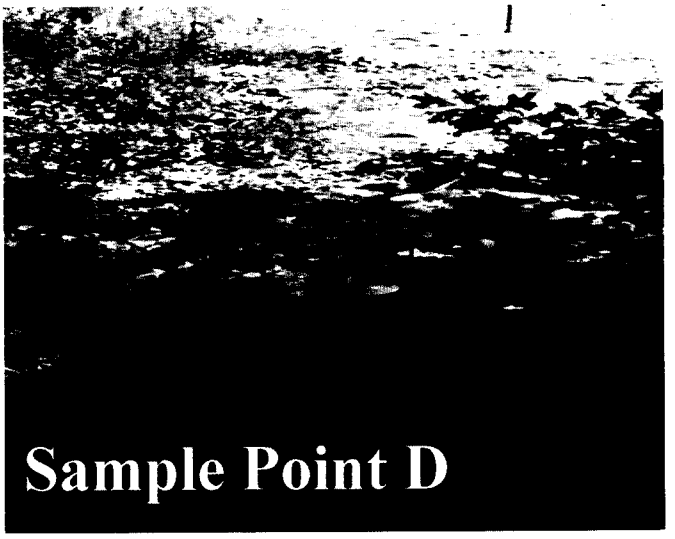
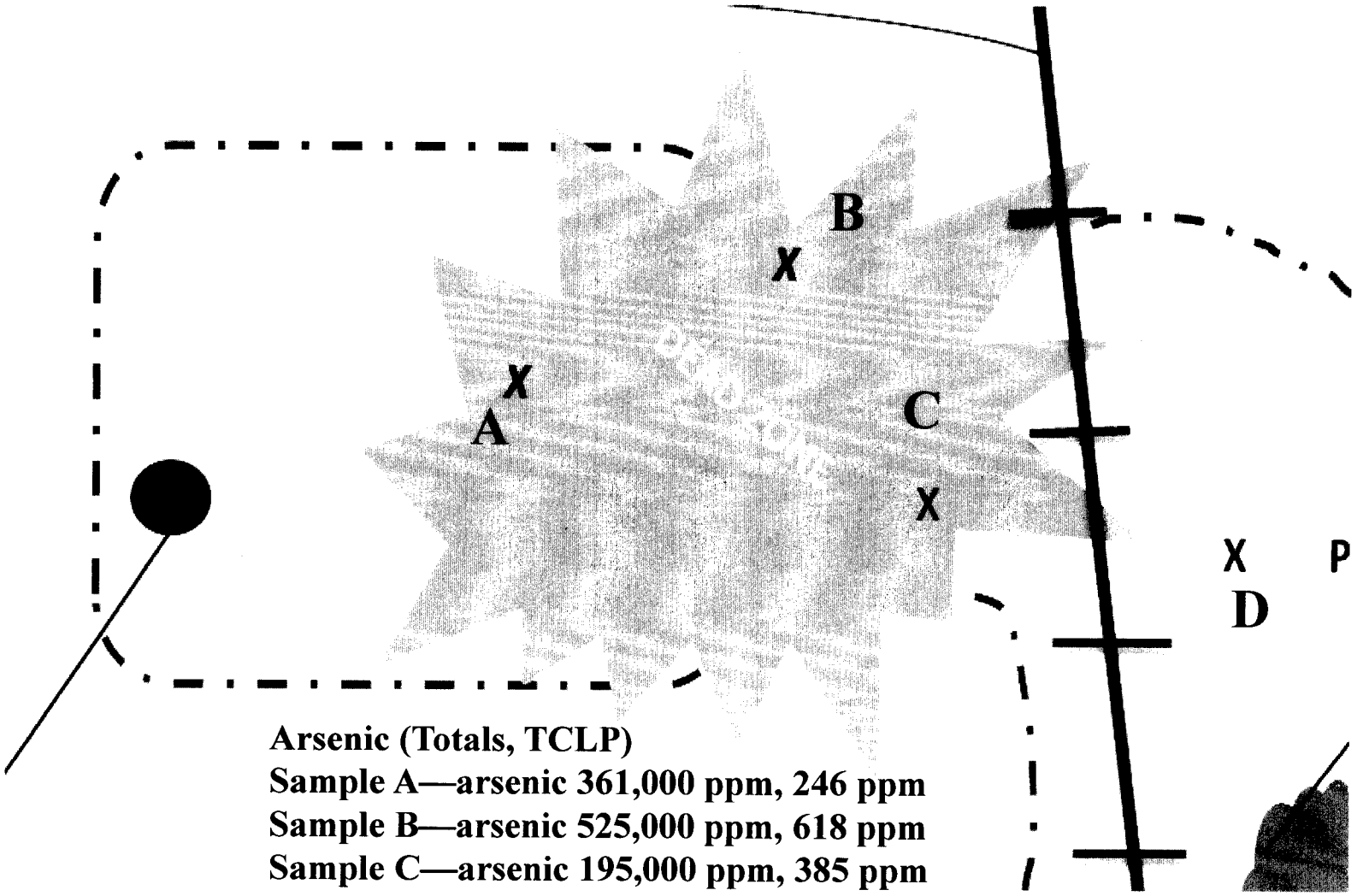
Images of Sample Location





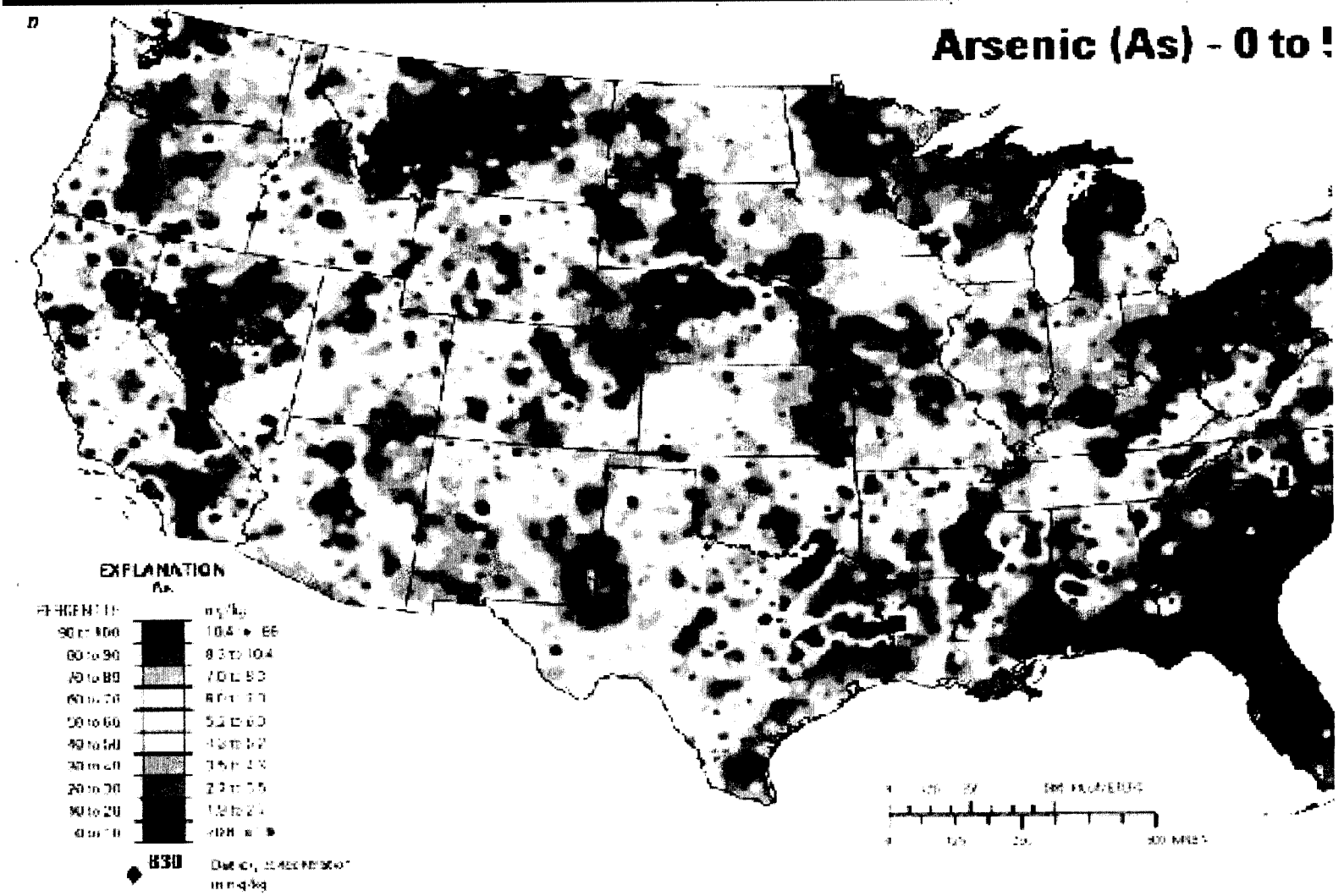


Sample Locations



Arsenic (Totals, TCLP)
Sample A—arsenic 361,000 ppm, 246 ppm
Sample B—arsenic 525,000 ppm, 618 ppm
Sample C—arsenic 195,000 ppm, 385 ppm
Sample D—arsenic 58,000 ppm, 51.4 ppm

Arsenic in Soils



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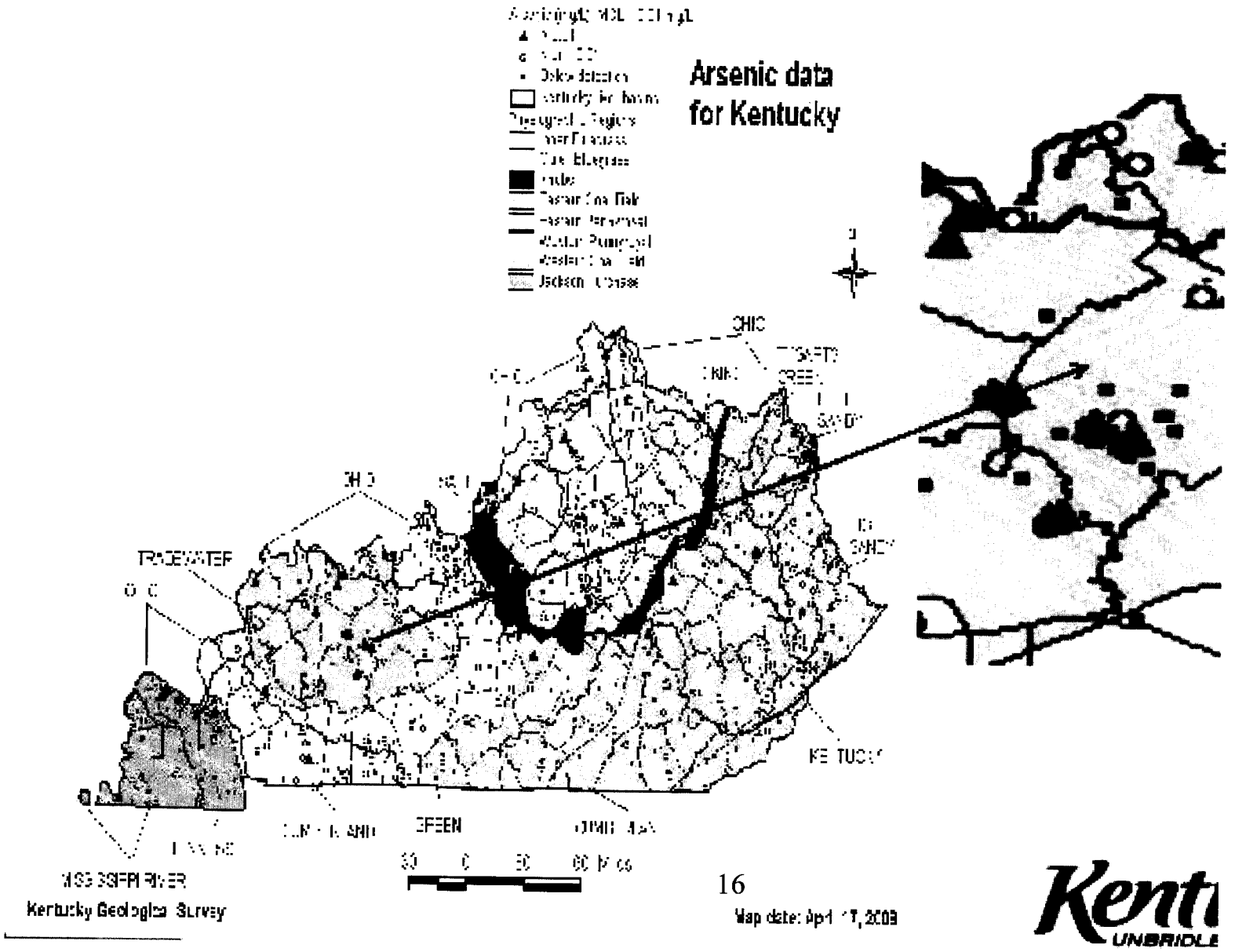
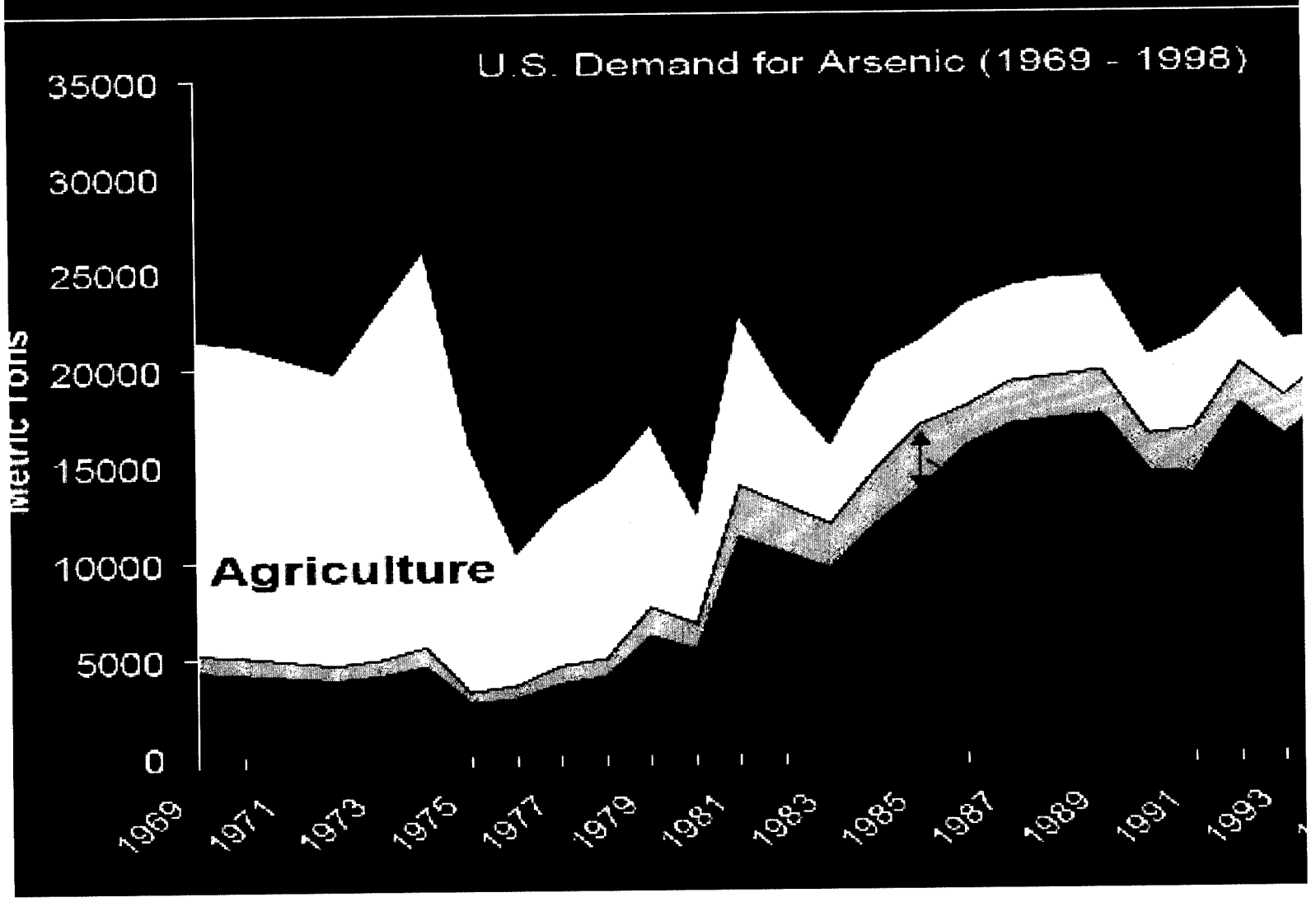
Arsenic in KY



Historical Data for Arsenic U



2nd Sample Collection Event (10/2

- PVA record and deed search conducted

- 2nd Sample Collection with analysis expande include herbicide/pesticide
  - Samples collected from down to up gradient
  - 55-gallon drum for used PPE left onsite

***Maintain safety and hazard taping of area of c

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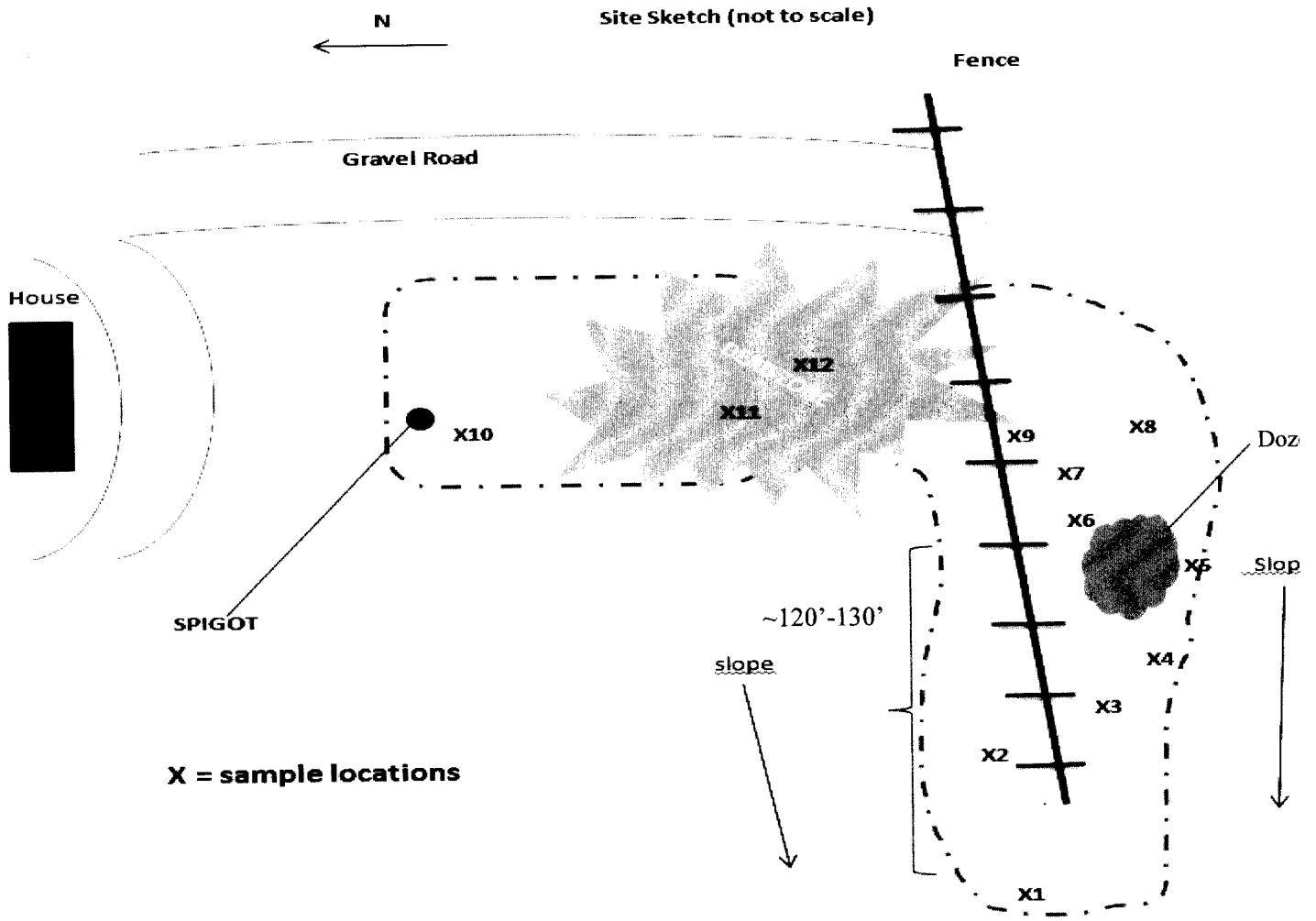
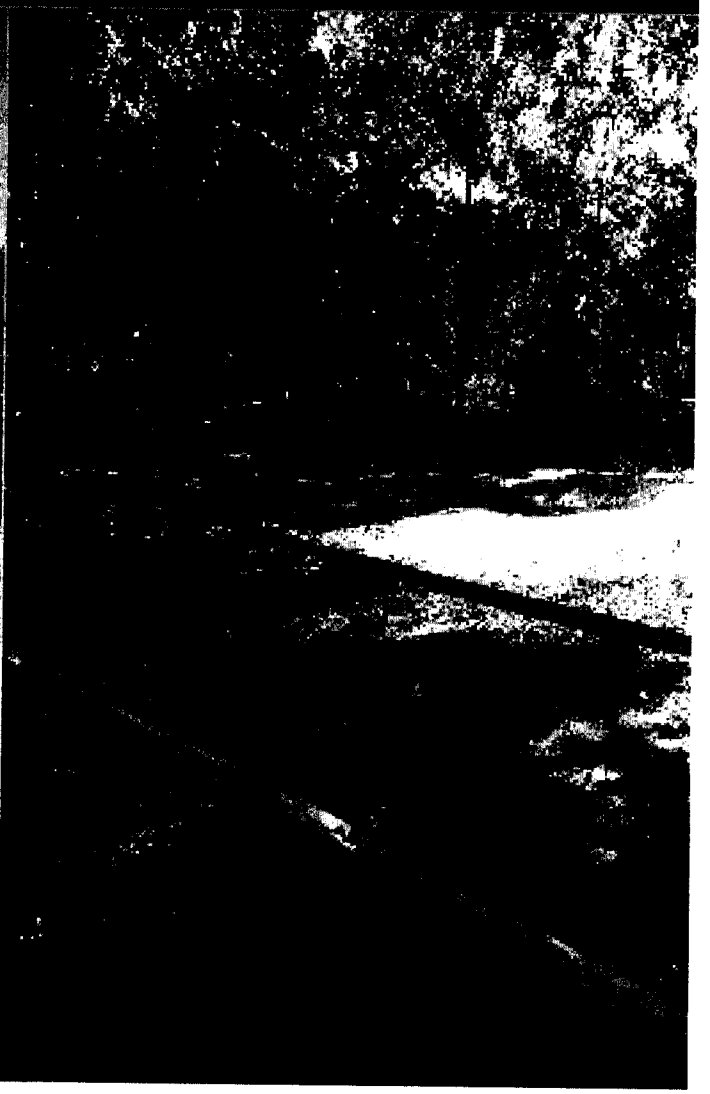
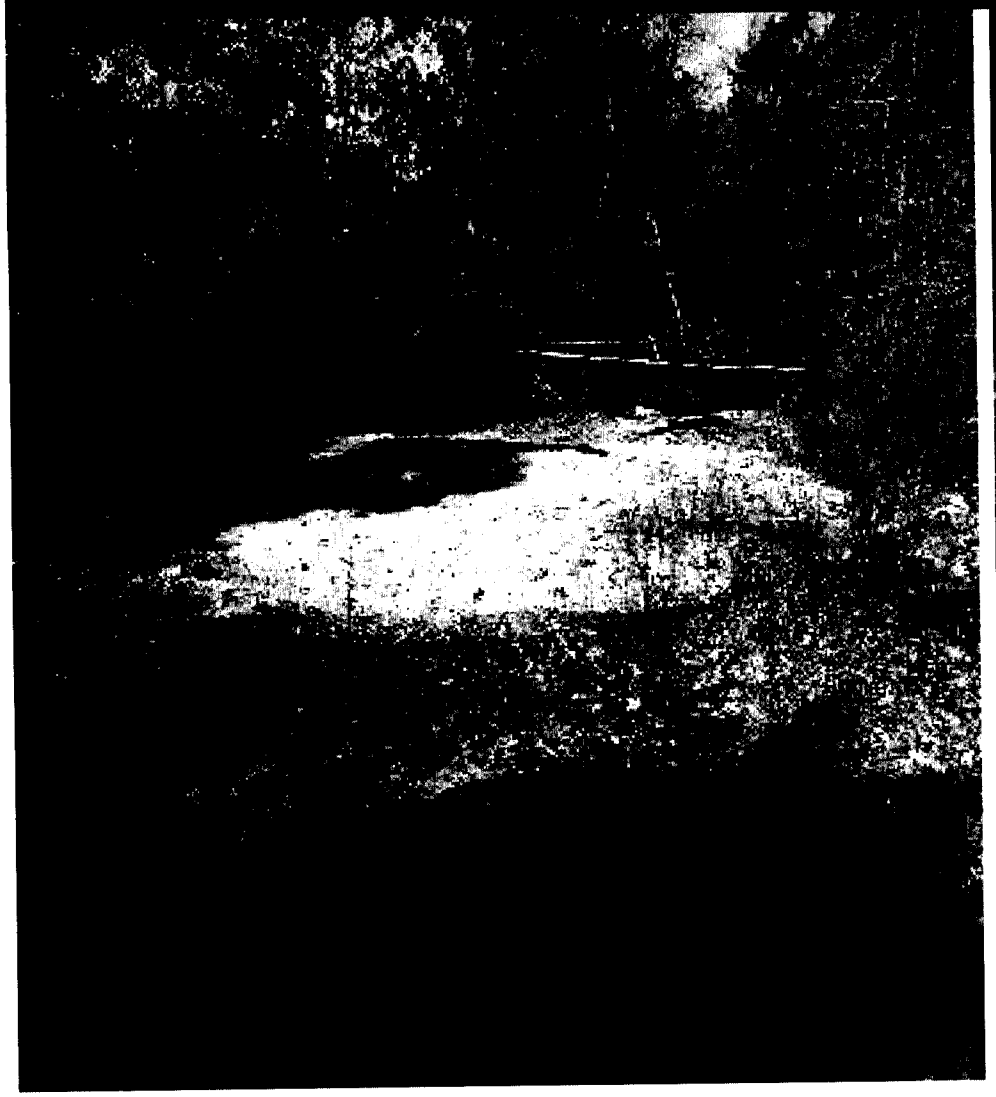
2nd Sample Collection Points (10/22



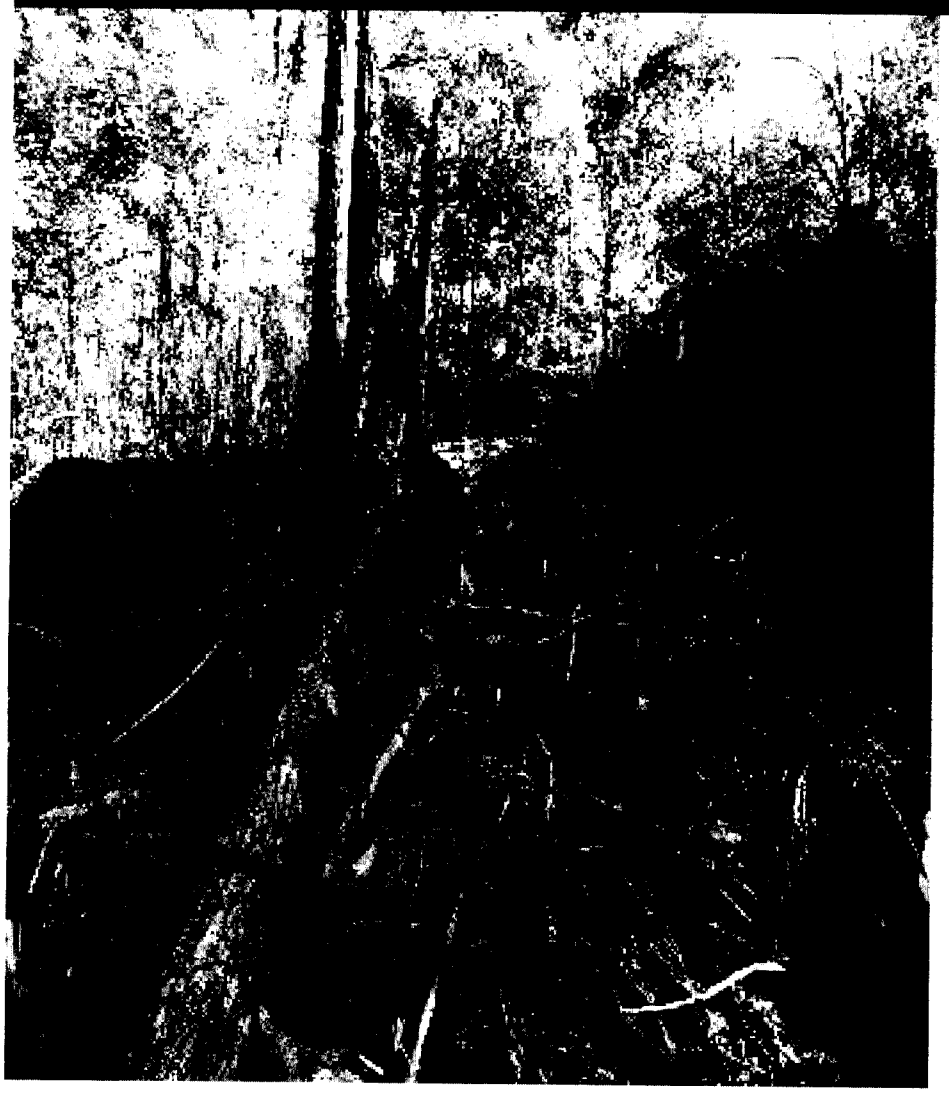
Wiley Property



Wiley Property



View of slope and Limited Vegeta



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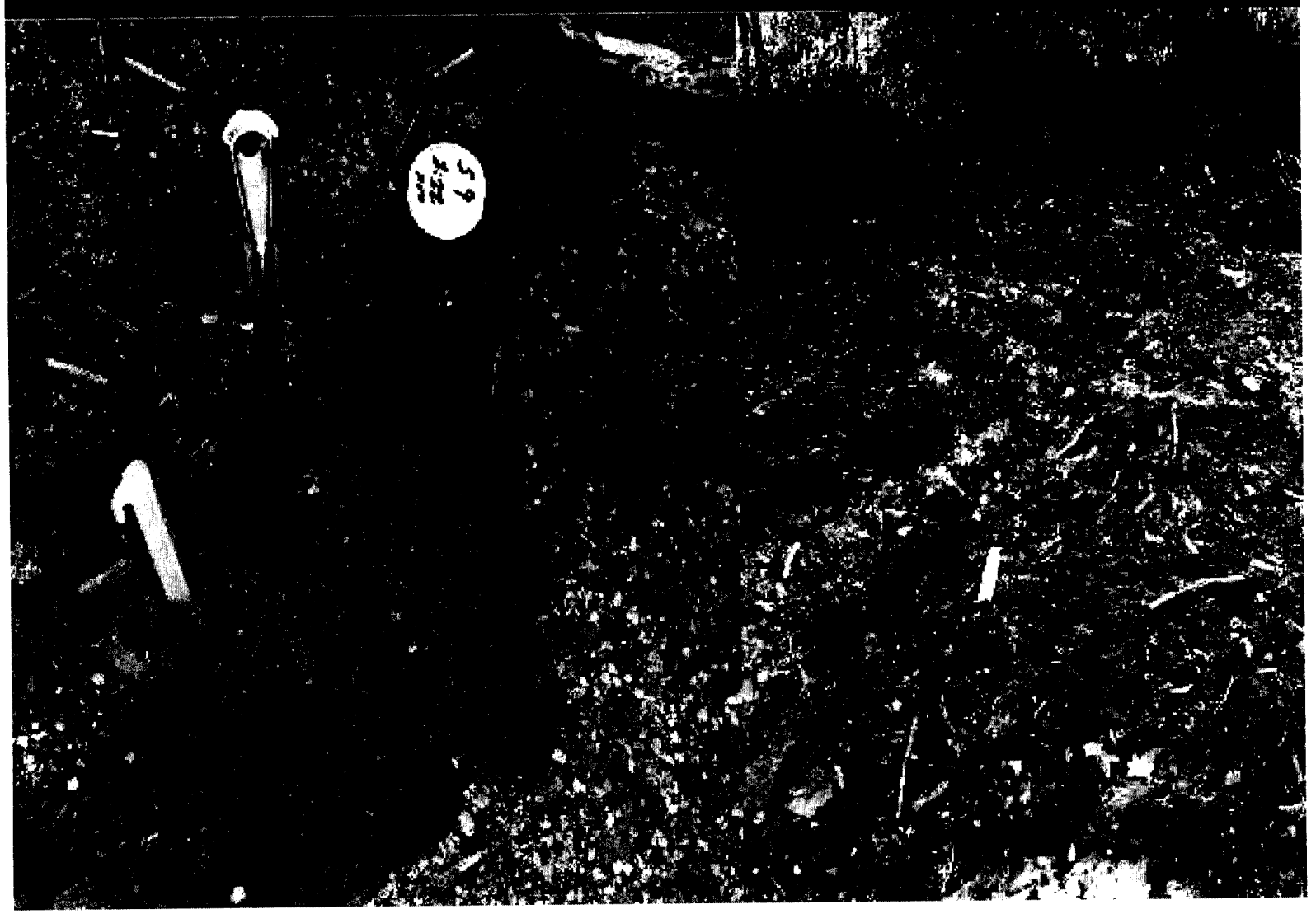
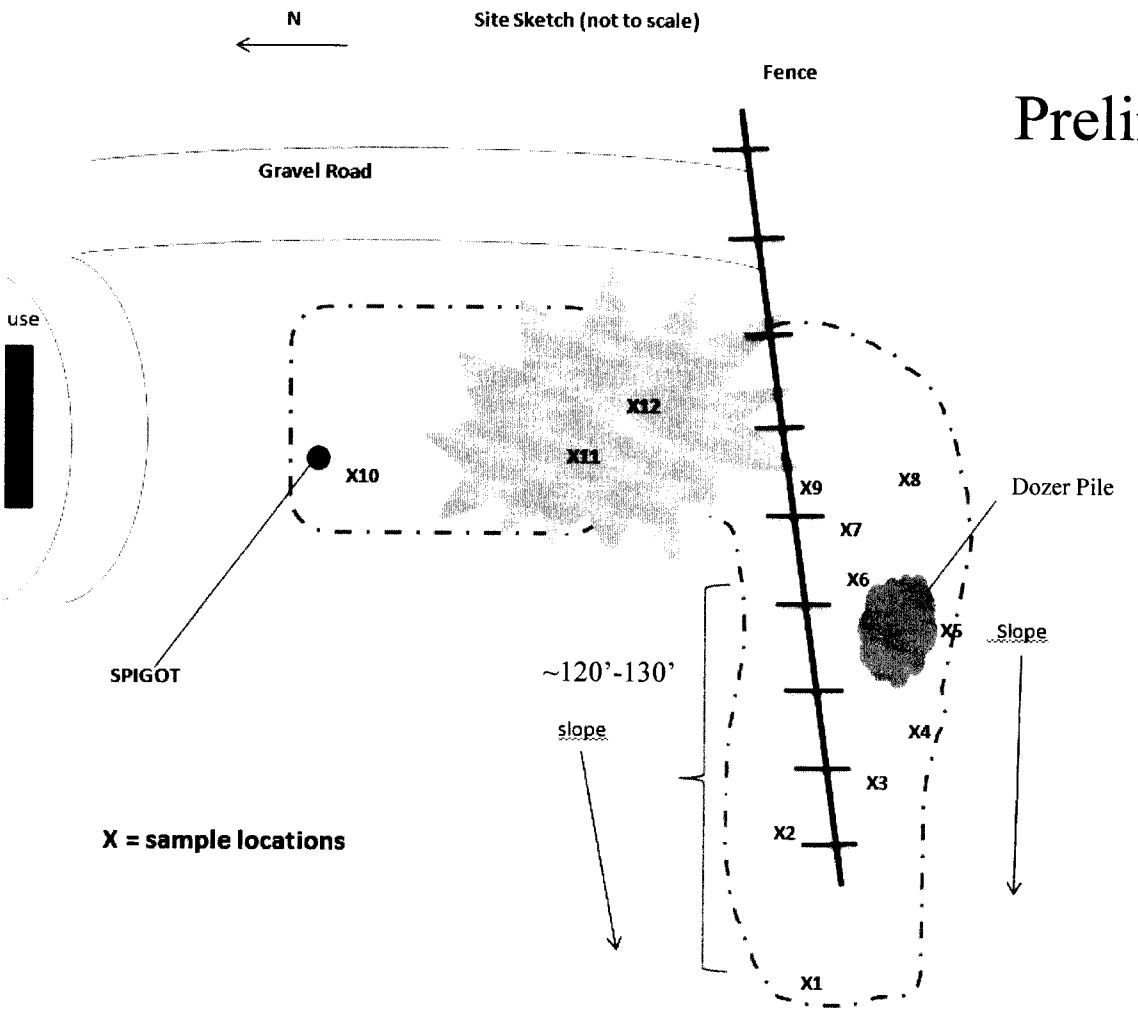
Sampling



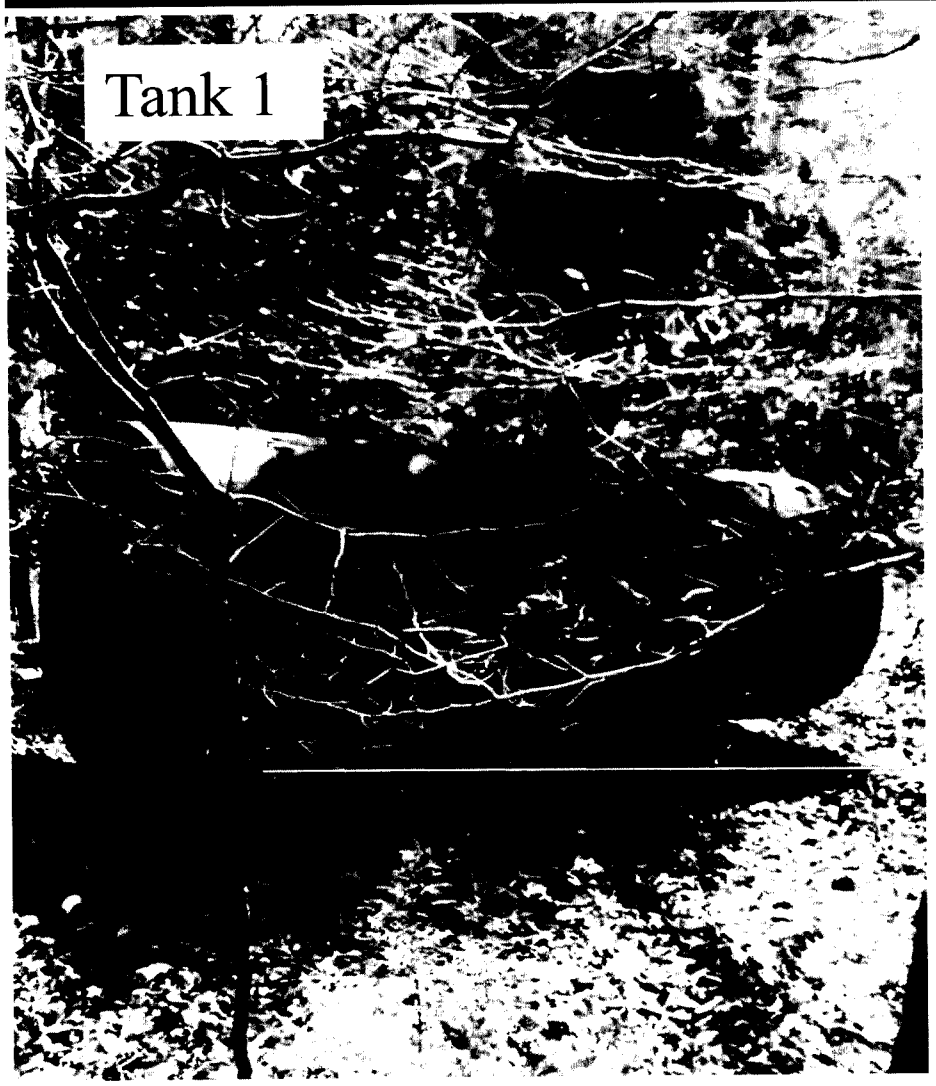
2nd Sample Collection Points (10/22

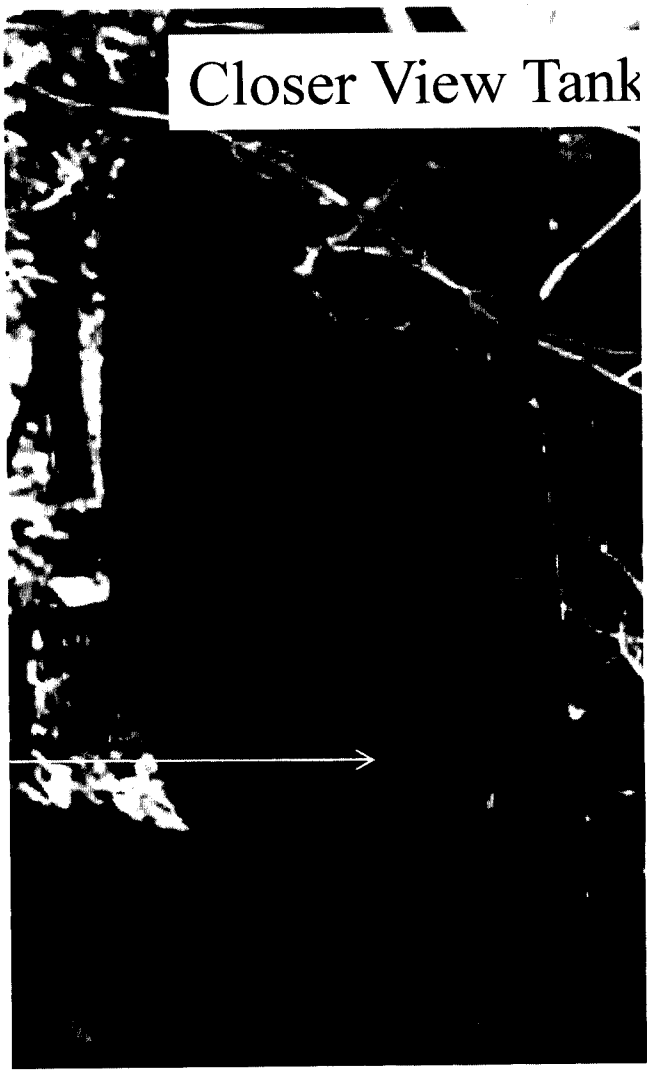


Preliminary Arsenic (t

X1	13,900
X2	13,300
X3	14,600
X4	12,200
X5	167,000
X6	4,080
X7	23,900
X8	24,600
X9	49,700
X10	164
X11	57,200
X12	458

Off-Site Tanks Found 11/03/



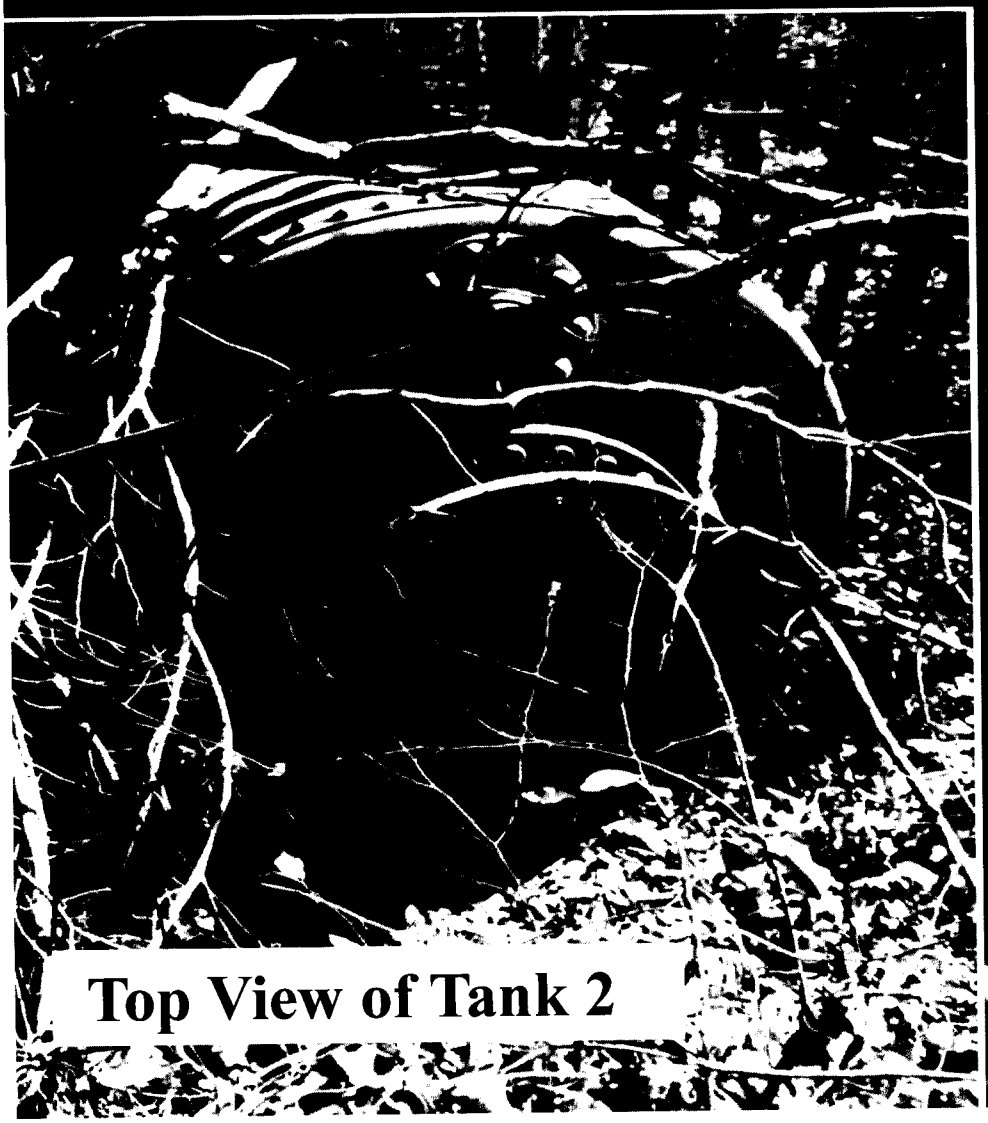


Tanks Found 11/03/14

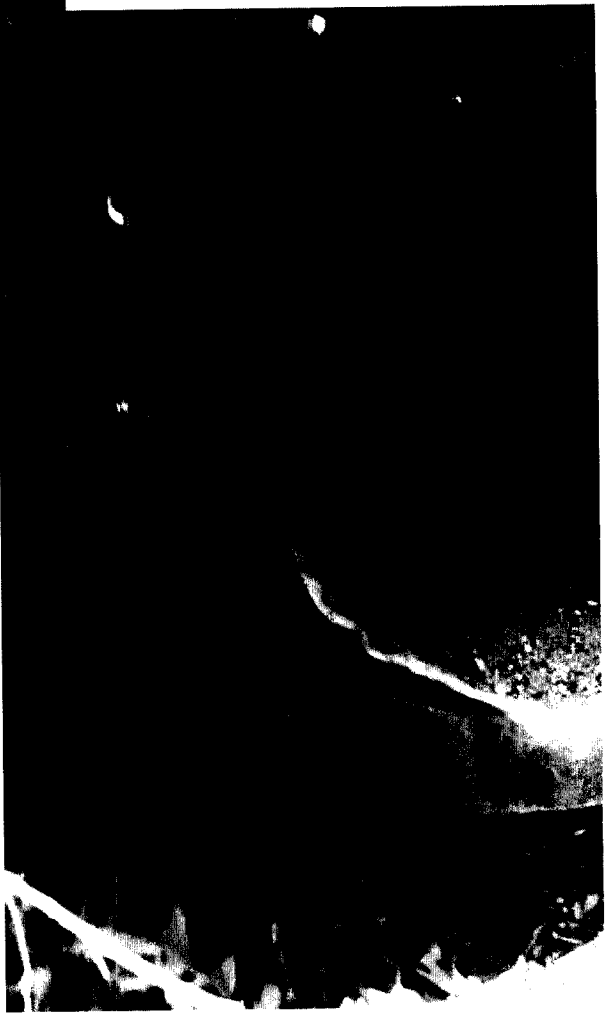
Side View of Tank 2

Dispensing end of Tank

Tank 2

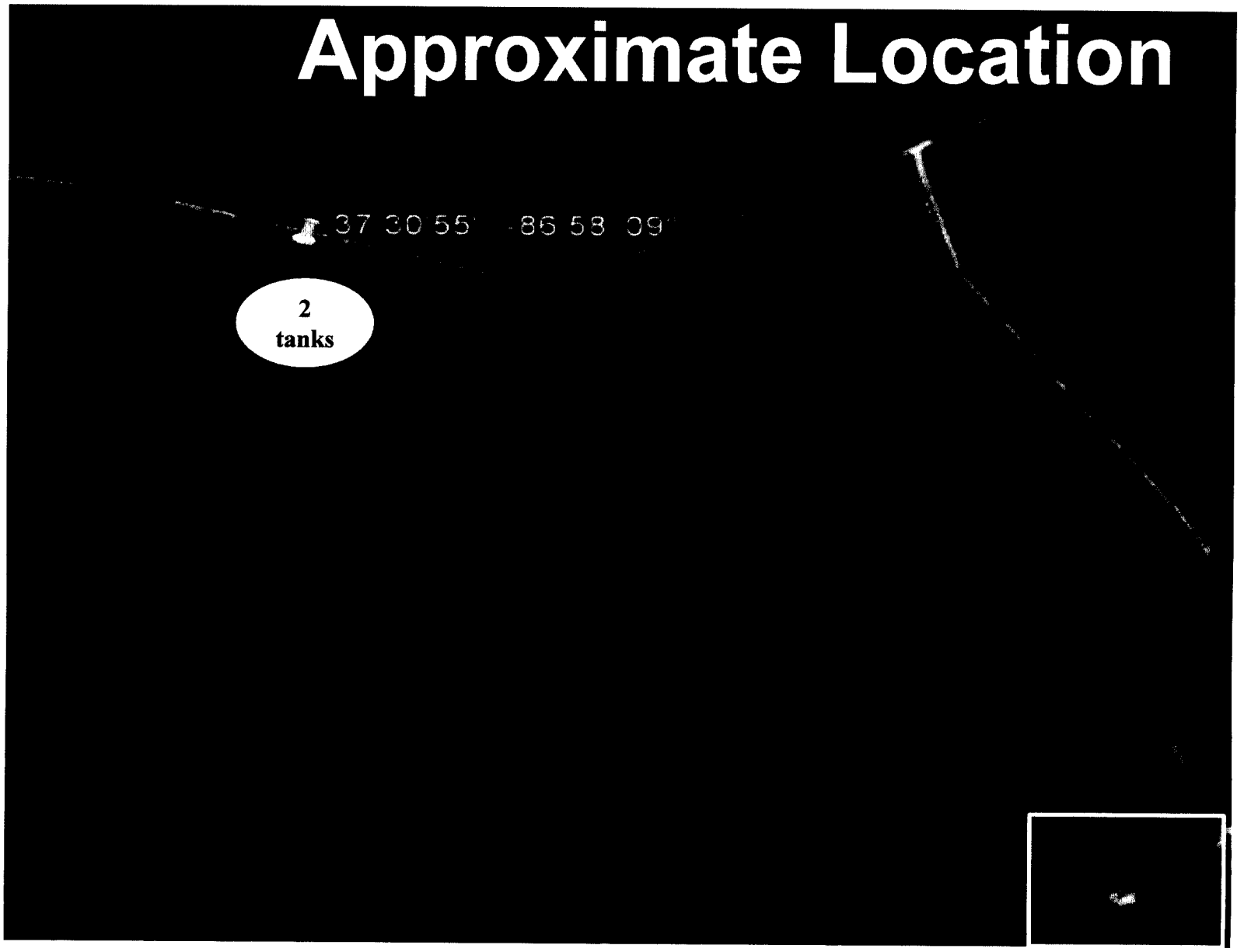


Top View of Tank 2



Closer View Tank

Approximate Location



AI# 124089 Wiley Property Arsenic

ng/Kg (ppm)	Notes/Comments	Date	Zone/Area	UCL95*	Avg.	Statistics Max.	Min.	SD
	Initial Sampling Event							
,85	TCLP. In bare arsenic area (Apparent Ground Zero).	10/2/2014	Apparent Ground Zero	411,645	129,502	525,000	458	183,016
5,000	In bare arsenic area (Apparent Ground Zero).	10/2/2014	Downgradient	150,605	37,513	167,000	4,080	63,552
,18	TCLP. In bare arsenic area (Apparent Ground Zero).	10/2/2014						
5,000	In bare arsenic area (Apparent Ground Zero).	10/2/2014	Upgradient					
:46	TCLP. In bare arsenic area (Apparent Ground Zero).	10/2/2014						
1,000	In bare arsenic area (Apparent Ground Zero).	10/2/2014						
51	TCLP. In bare arsenic area (Apparent Ground Zero).	10/2/2014						
,000	In bare arsenic area (Apparent Ground Zero).	10/2/2014						
	Second Sampling Event							
,900	Last immediate downgradient, 120+ ft.	10/22/2014						
,300	Fifth immediate downgradient	10/22/2014						
,600	Fourth immediate downgradient	10/22/2014						
,200	Third immediate downgradient	10/22/2014						
7,000	Second immediate downgradient	10/22/2014						
080	First immediate downgradient	10/22/2014						
,900	In bare arsenic area (Apparent Ground Zero).	10/22/2014						
,600	In bare arsenic area (Apparent Ground Zero).	10/22/2014						
,700	In bare arsenic area (Apparent Ground Zero).	10/22/2014						
64	In bare arsenic area, but up grade toward house	10/22/2014						
,200	In bare arsenic area (Apparent Ground Zero).	10/22/2014						
58	In bare arsenic area (Apparent Ground Zero).	10/22/2014						

*** There are too few data points for a UCL 95 Calculation to be reliable, though it can be calculated.**

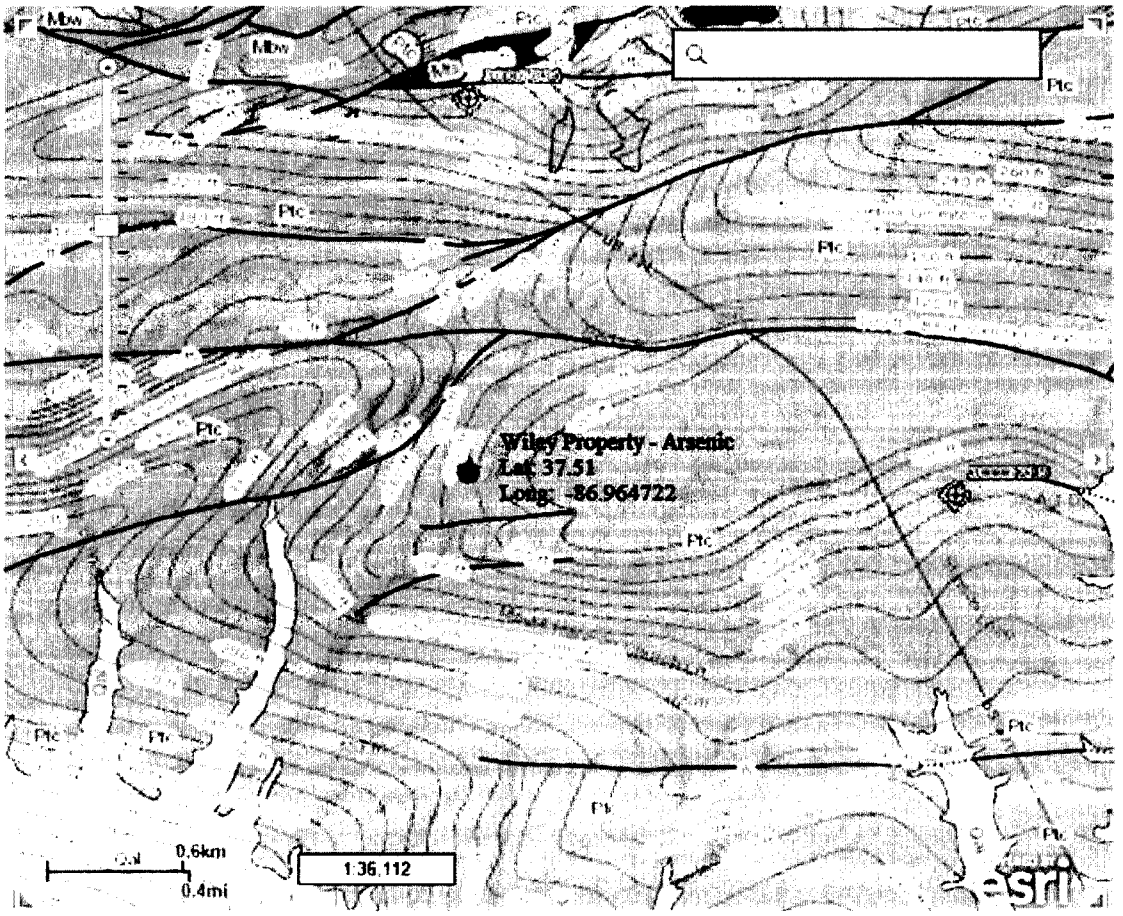
Geologic Quadrangle

Tradewater and Caseyville Formations
(Lower Pennsylvanian - Middle Pennsylvanian)

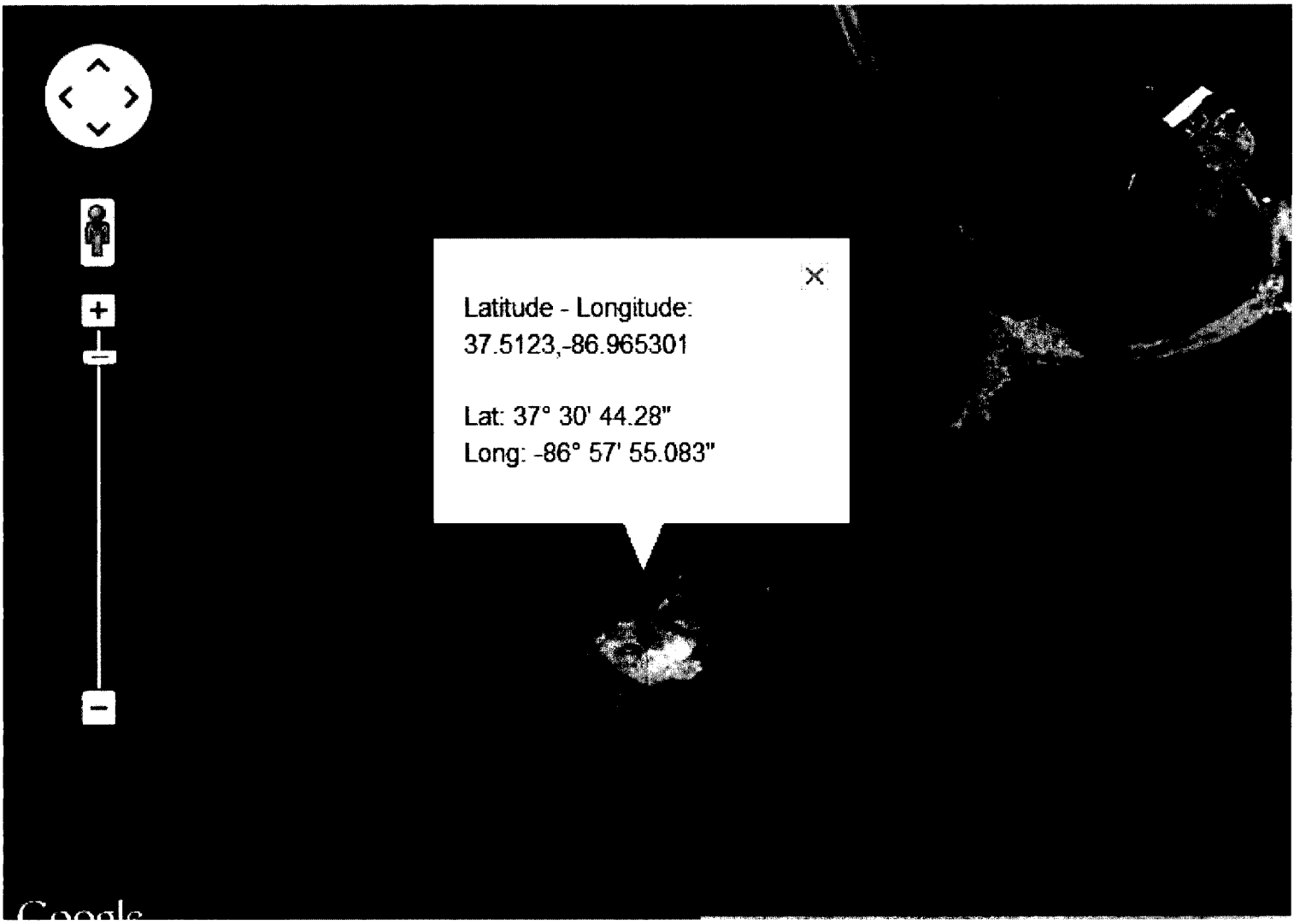
Ptc TRADEWATER AND CASEYVILLE FORMATIONS
Pleasant Ridge 7.5 Minute GQ
Primary Lithology: Sandstone, shale, siltstone, coal, and limestone
Sandstone, shale, siltstone, coal, and limestone: Sandstone, light-brown to brown and light-gray, fine to medium grained, locally massive and cross in places contains ferruginous lenses and concretions. Shale, light- to dark gray and light-brown, locally carbonaceous. Siltstone, light-gray and ligh discontinuous coal beds from 1/2 foot to as much as 4 feet thick. A thin coal bed overlain by a 4-foot-thick limestone bed about 850 feet above the mapped. Limestone, light gray and yellowish-brown, dense, discontinuous, locally underlain by carbonaceous shale or coal.

Sandstone, shale, siltstone, and coal: Sandstone, light-brown and light-gray, fine- to medium-grained, massive; locally grades into siltstone and sh below top of the Kinkaid Limestone. Shale, gray, sandy to clayey. Siltstone, light-gray, thin-bedded.

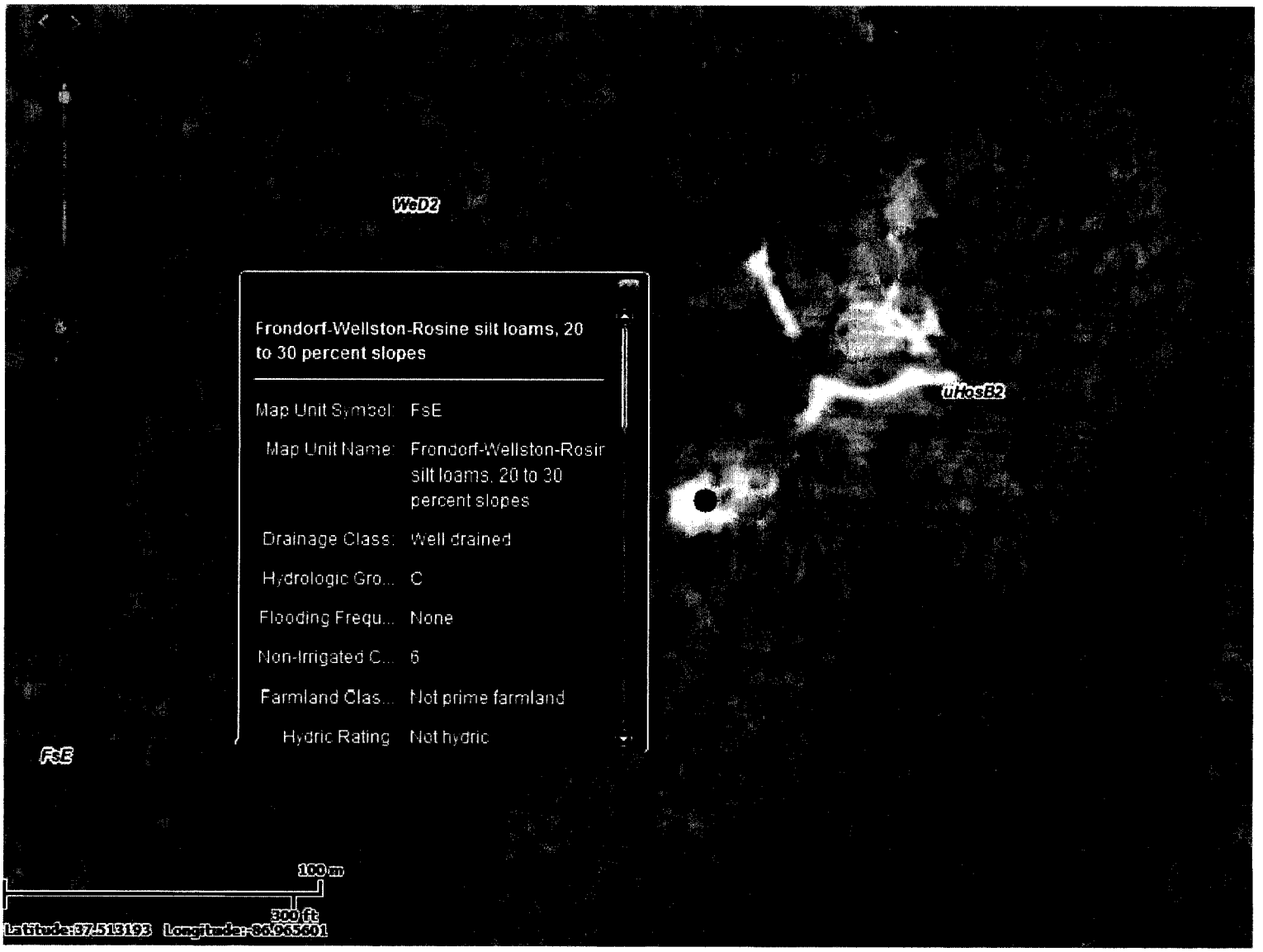
Sandstone, shale, siltstone, coal, and limestone: Sandstone, light-brown to brown and light-gray, fine to medium grained, locally massive and cros in places contains ferruginous lenses and concretions. Shale, light- to dark gray and light-brown, locally carbonaceous. Siltstone, light-gray and ligl discontinuous coal beds from 1/2 foot to as much as 4 feet thick. A thin coal bed overlain by a 4-foot-thick limestone bed about 850 feet above the mapped. Limestone, light gray and yellowish-brown, dense, discontinuous, locally underlain by carbonaceous shale or coal.



Aerial Map View

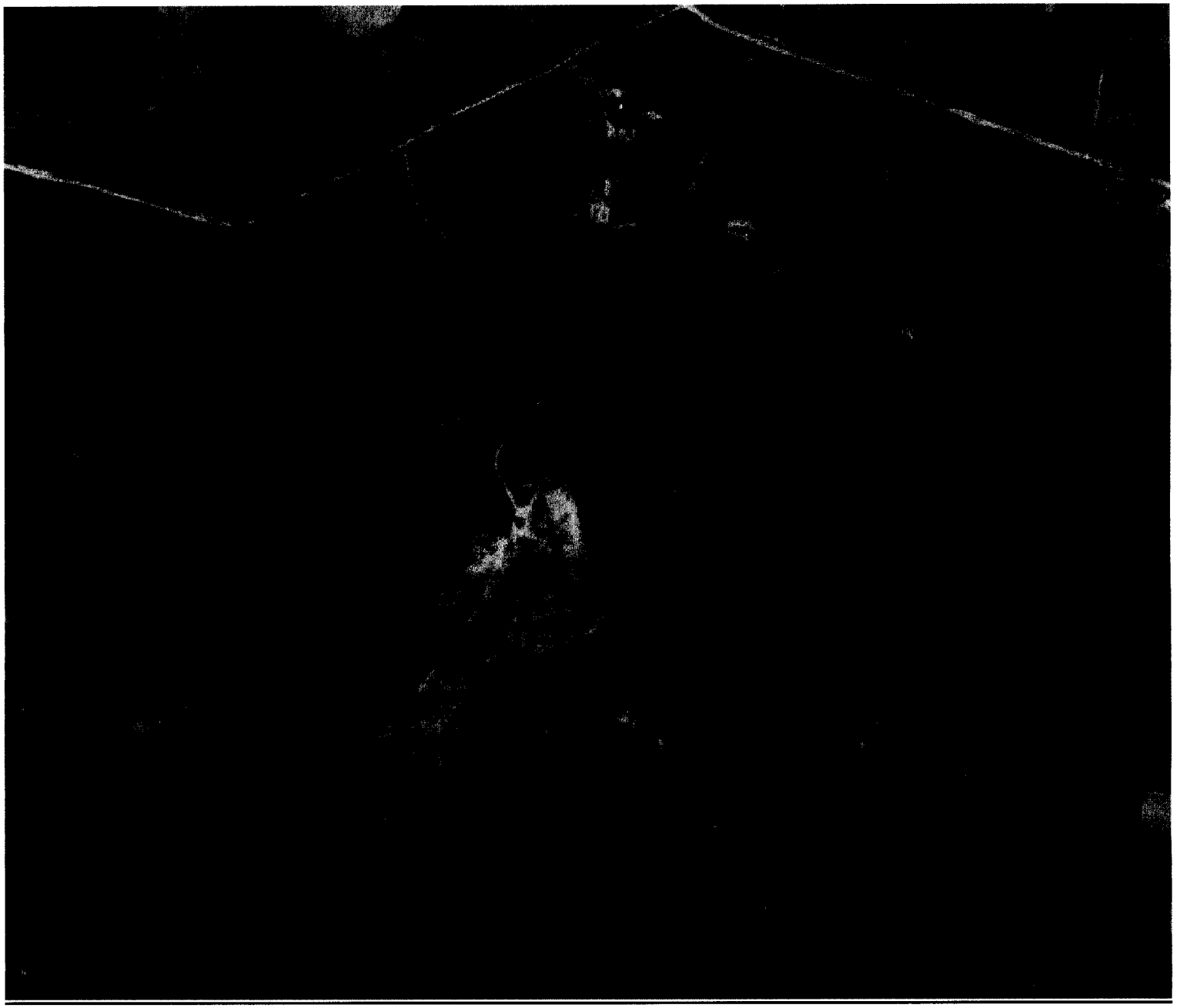


Soil Map Overlay

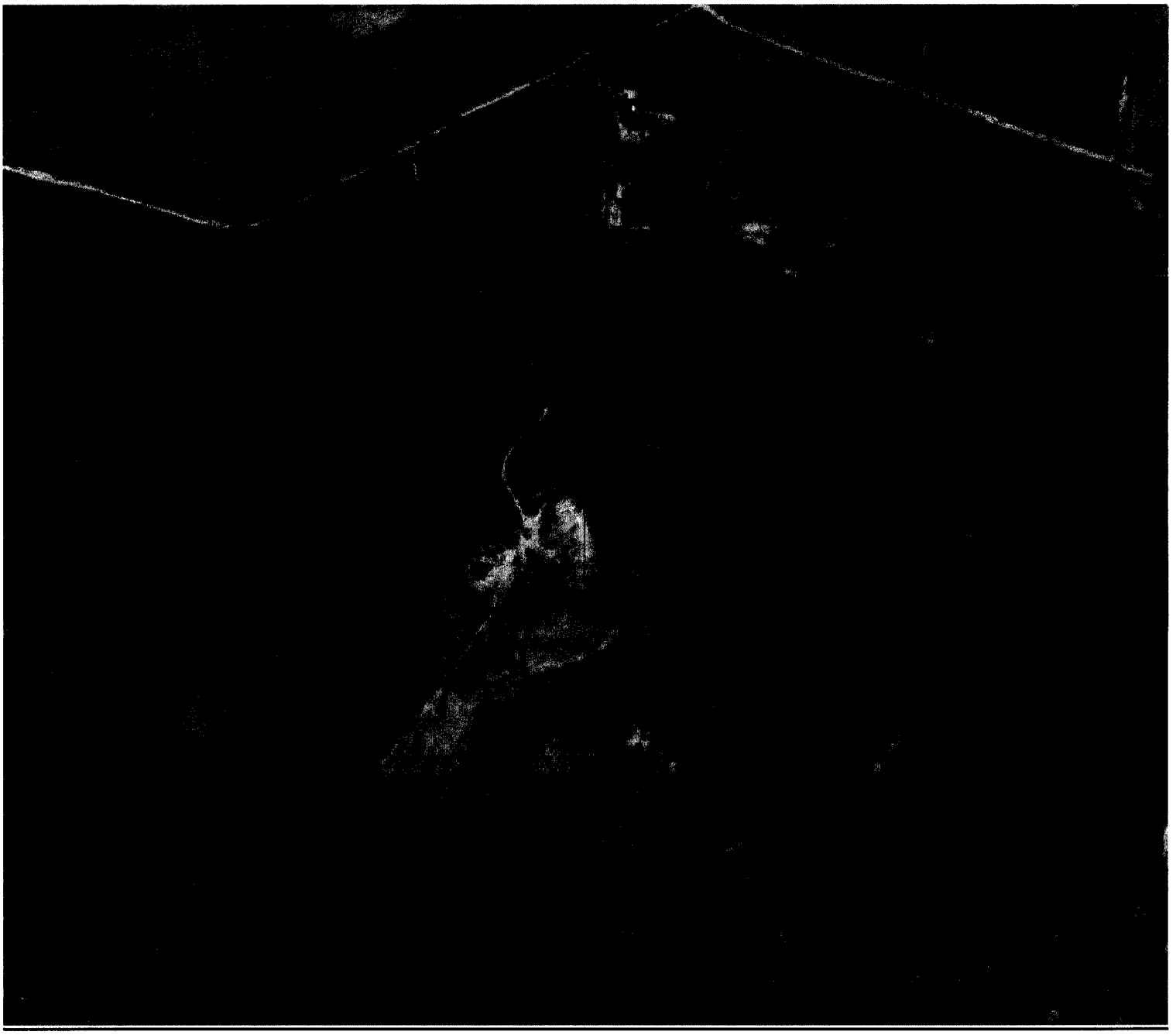


Topographic Quadrangle

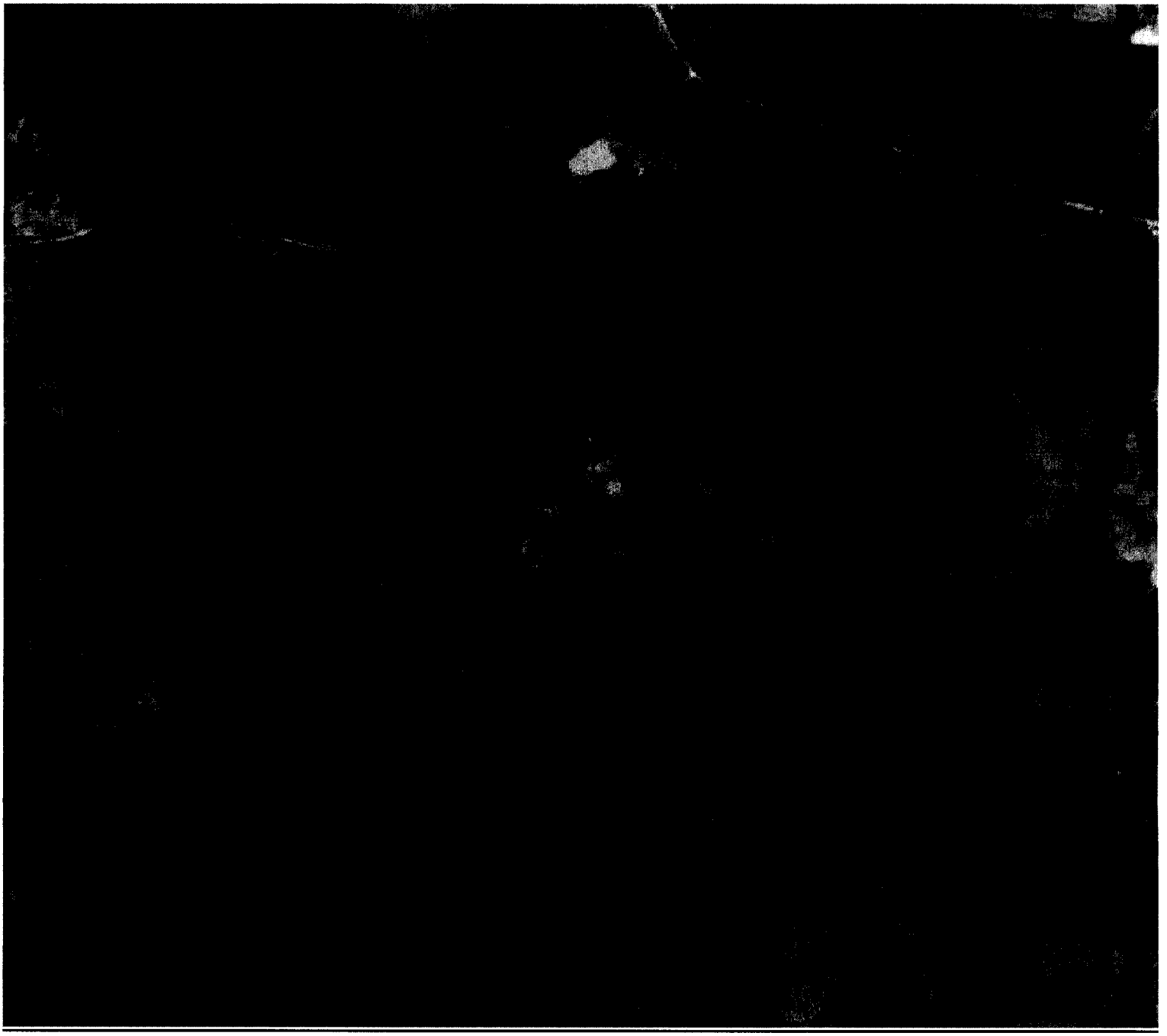
Historic Aerial Map April 8, 1950



Historic Aerial Map April 18, 1951



Historic Aerial Map November 29, 1972



Historic Aerial Map From Earth Explorer 1972

Historic Aerial Map From Google Earth 1998