ENVIRONMENTAL STANDARDS

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QUALITY ASSURANCE REVIEW

OF THE OU-4B AND OU-5 SOIL INVESTIGATION

METEORIC WATER MOBILITY PROCEDURE SAMPLES

COLLECTED ON NOVEMBER 25, 2019 AND DECEMBER 3, 2019

AT THE ANACONDA COPPER MINE SITE

IN YERINGTON, NEVADA

August 25, 2020

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1.0 Introduction

This quality assurance (QA) review is based upon a rigorous examination of all data generated from the analyses of the OU-4b and OU-5 soil investigation Meteoric Water Mobility Procedure (MWMP) samples that were collected by Wood Environment & Infrastructure Solutions, Inc., on November 25, 2019 and December 3, 2019, at the Anaconda Copper Mine Site in Yerington, Nevada. These samples were analyzed by ACZ Laboratories, Inc. in Steamboat Springs, Colorado. The samples and analyses included in this QA review are specified on Table 1.

This review has been performed with guidance from the "National Functional Guidelines for Inorganic Data Review" (US EPA, February 1994). This document has been used to aid the data reviewer in the interpretation of the quality control (QC) analysis results and in the overall evaluation of the sample data deliverables. It should be noted, however, that results affected by blank contamination will be designated with a "UJ" qualifier (not the "U" qualifier typically used when following the National Functional Guidelines) in order to be consistent with historical project validation protocols.

The reported analytical results are presented as a summary of the data in Section 2. Data were examined to determine the usability of the analytical results and the compliance relative to the requirements specified in the published analytical methods and the Site-Wide Quality Assurance Project Plan Anaconda Copper Mine Site Yerington, Nevada, Update Version 5.1 (September 5, 2018). Qualifier codes have been placed next to results to enable the data user to quickly assess the qualitative and/or quantitative reliability of any result. This critical QA review identifies data quality issues for specific samples and specific evaluation criteria. The data qualifications allow the data's end-user to best understand the usability of the analytical results. Data not qualified in this report should be considered valid based on the QC criteria that have been reviewed. Details of this QA review are presented in Section 1 of this report. This report was prepared to provide a critical review of the laboratory analyses and reported analytical results. Rigorous QA reviews of laboratory-generated data routinely identify various problems associated with analytical measurements, even from the most experienced and capable laboratories.

TABLE 1

SAMPLES INCLUDED IN THIS QUALITY ASSURANCE REVIEW

Field Sample Identification	Laboratory Sample Identification	SDG	Matrix	Date Sample Collected	Parameter(s) Examined
STSB32_0.5-3	L56331-01	L56331	MWMP	11/25/2019	M^1, M^2, Hg, CN, Cl, F, SO_4, N, TKN, ALK, TDS, ^{226}Ra, ^{228}Ra
STSB32_0.5-3MS (Matrix Spike)	L56331-01MS	L56331	MWMP	11/25/2019	F, N, TKN
STSB32_0.5-3MSD (Matrix Spike Duplicate)	L56331-01MSD	L56331	MWMP	11/25/2019	F
STSB32_0.5-3DUP (Laboratory Duplicate)	L56331-01DUP	L56331	MWMP	11/25/2019	Cl, SO_4, CN, ^{226}Ra, ^{228}Ra
STSB32_6-15	L56331-02	L56331	MWMP	11/25/2019	M^1, M^2, Hg, CN, Cl, F, SO_4, N, TKN, ALK, TDS, ^{226}Ra, ^{228}Ra
STSB32_6-15MS (Matrix Spike)	L56331-02MS	L56331	MWMP	11/25/2019	CN, Cl, SO_4, ^{226}Ra, ^{228}Ra
STSB32_6-15DUP (Laboratory Duplicate)	L56331-02DUP	L56331	MWMP	11/25/2019	TKN
STSB34_0.5-3	L56331-03	L56331	MWMP	11/25/2019	M^1, M^2, Hg, CN, Cl, F, SO_4, N, TKN, ALK, TDS, ^{226}Ra, ^{228}Ra
STSB34_6-15	L56331-04	L56331	MWMP	11/25/2019	M^1, M^2, Hg, CN, Cl, F, SO_4, N, TKN, ALK, TDS, ^{226}Ra, ^{228}Ra
STSB34_6-15DUP (Laboratory Duplicate)	L56331-04DUP	L56331	MWMP	11/25/2019	TDS
STSB33_0.5-3	L56331-05	L56331	MWMP	12/3/2019	M^1, M^2, Hg, CN, Cl, F, SO_4, N, TKN, ALK, TDS, ^{226}Ra, ^{228}Ra
STSB33_0.5-3MS (Matrix Spike)	L56331-05MS	L56331	MWMP	12/3/2019	M^1, M^2, Hg
STSB33_0.5-3MSD (Matrix Spike Duplicate)	L56331-05MSD	L56331	MWMP	12/3/2019	M^1, M^2, Hg

TABLE 1 (Cont.)

Field Sample Identification	Laboratory Sample Identification	SDG	Matrix	Date Sample Collected	Parameter(s) Examined
STSB33_6-15	L56331-06	L56331	MWMP	12/3/2019	M^1, M^2, Hg, CN, Cl, F, SO_4, N, TKN, ALK, TDS, ^{226}Ra, ^{228}Ra
STSB33-FD_0.5-3 (Field Duplicate of STSB33_0.5-3)	L56331-07	L56331	MWMP	12/3/2019	M^1, M^2, Hg, CN, Cl, F, SO_4, N, TKN, ALK, TDS, ^{226}Ra, ^{228}Ra
STSB35_0.5-3	L56331-08	L56331	MWMP	12/3/2019	M^1, M^2, Hg, CN, Cl, F, SO_4, N, TKN, ALK, TDS, ^{226}Ra, ^{228}Ra
STSB35_6-15	L56331-09	L56331	MWMP	12/3/2019	M^1, M^2, Hg, CN, Cl, F, SO_4, N, TKN, ALK, TDS, ^{226}Ra, ^{228}Ra
STSB35_6-15DUP (Laboratory Duplicate)	L56331-09DUP	L56331	MWMP	12/3/2019	ALK, N

NOTES:

M^1 - ICP Metals (specifically, aluminum, barium, boron, calcium, iron, lithium, magnesium, phosphorus, potassium, sodium, strontium, tin, and titanium) by SW-846 Method 6010D.
M^2 - ICP/MS Metals (specifically, antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, thallium, thorium, uranium, vanadium, and zinc) by SW-846 Method 6020B.
Hg - Mercury by SW-846 Method 7470.
CN - Cyanide, Weak-Acid Dissociable (WAD) by Standard Method 4500-CN I.
Cl - Chloride by Standard Method 4500-Cl E.
F - Fluoride by Standard Method 4500-F C.
SO_4 - Sulfate by ASTM Method D516-07.
N - Nitrate Nitrogen, Nitrite Nitrogen, and Nitrate/Nitrite Nitrogen by US EPA Method 353.2.
TKN - Total Kjeldahl Nitrogen by US EPA Method 351.2.
ALK - Total Alkalinity, Bicarbonate Alkalinity, Carbonate Alkalinity, and Hydroxide Alkalinity as $CaCO_3$ by Standard Method 2320B.
TDS - Total Dissolved Solids by Standard Method 2540C.
^{226}Ra - Radium-226 by US EPA Method 903.1 (modified).
^{228}Ra - Radium-228 by SW-846 Method 9320.
MWMP - Meteoric Water Mobility Procedure Extract.

2.0 Findings

Complete support documentation for this inorganic, general chemistry, and radiological QA review is presented in Section 8.0 of this report.

A. ICP Metals Analyses

Eleven samples (including QC samples) were analyzed for inductively coupled plasma (ICP) metals (specifically aluminum, barium, boron, calcium, iron, lithium, magnesium, phosphorus, potassium, sodium, strontium, tin, and titanium) by SW-846 Method 6010D. The findings offered in this report for this fraction are based on the items on the following table:

Item Reviewed	Acceptable	Acceptable with Qualification	Not Acceptable
Holding Times	√		
Blank Analysis Results		√	
LCS Results	√		
MS/MSD Results		√	
Laboratory Duplicate Precision	√		
Serial Dilution Analysis	√		
Detection Limits/Sensitivity	√		
Calibrations	√		
RL Standard Recoveries	√		
ICP Interference Check Samples	√		
Field Duplicate Precision	√		
Analytical Sequence	√		
Sample Preparation	√		
Quantitation of Positive Results		√	
Evaluation of Raw Data	√		

Blank Analysis Results: Boron was observed in the method blank associated with the project samples. The reported positive results for boron in all samples should be considered "not-detected" and have been flagged "UJ" on the data tables. The value in the result field of the data tables should be considered the revised method detection limit (MDL) and reporting limit (RL [if the reported result exceeded the RL]).

MS/MSD Results: A low recovery (< 75%) was observed for phosphorus in an associated matrix spike (MS) analysis, indicating a low bias. The detection limit for phosphorus in sample STSB35_6-15 may be higher than reported, and the "not-detected" result has been flagged "UJ" on the data tables.

Quantitation of Positive Results: All positive results reported at concentrations greater than the MDL, but less than the RL, were qualified as estimated and have been flagged "J" on the data tables.

B. ICP/MS Metals Analyses

Eleven samples (including QC samples) were analyzed for inductively coupled plasma/mass spectrometry (ICP/MS) metals (specifically, antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, thallium, thorium, uranium, vanadium, and zinc) by SW-846 Method 6020B. The findings offered in this report for this fraction are based on the items on the following table:

Item Reviewed	Acceptable	Acceptable with Qualification	Not Acceptable
Holding Times	√		
Blank Analysis Results	√		
LCS Results	√		
MS/MSD Results	√		
Laboratory Duplicate Precision	√		
Detection Limits/Sensitivity	√		
Calibrations	√		
RL Standard Recoveries	√		
Internal Standard Recoveries	√		
Serial Dilution Analysis	√		
Field Duplicate Precision	√		
Analytical Sequence	√		
Sample Preparation	√		
Quantitation of Positive Results		√	
Evaluation of Raw Data	√		

Quantitation of Positive Results: All positive results reported at concentrations greater than the MDL, but less than the RL, were qualified as estimated and have been flagged "J" on the data tables.

C. Mercury Analyses

Eleven samples (including QC samples) were analyzed for mercury by SW-846 Method 7470. The findings offered in this report for this fraction are based on the items on the following table.

Item Reviewed	Acceptable	Acceptable with Qualification	Not Acceptable
Holding Times	√		
Blank Analysis Results	√		
LCS Results	√		
MS/MSD Results	√		
Laboratory Duplicate Precision	√		
Detection Limits/Sensitivity	√		
Calibrations	√		
RL Standard Recoveries	√		
Field Duplicate Precision	√		
Analytical Sequence	√		
Sample Preparation	√		
Quantitation of Positive Results		√	
Evaluation of Raw Data	√		

Quantitation of Positive Results: All positive results reported at concentrations greater than the MDL, but less than the RL, were qualified as estimated and have been flagged "J" on the data tables.

D. General Chemistry Analyses

Sixteen samples (including QC samples) were collectively analyzed for weak-acid dissociable (WAD) cyanide by Standard Method 4500-CN I; for chloride by Standard Method 4500-Cl E; for fluoride by Standard Method 4500-F C; for sulfate by ASTM Method D516-07; for nitrate nitrogen, nitrite nitrogen, and nitrate/nitrite nitrogen by US EPA Method 353.2; for total Kjeldahl nitrogen by US EPA Method 351.2; for total alkalinity, bicarbonate alkalinity, carbonate alkalinity, and hydroxide alkalinity as $CaCO_3$ by Standard Method 2320B; and for total dissolved solids by Standard Method 2540C. The findings offered in this report for this fraction are based on the items on the following table:

Item Reviewed	Acceptable	Acceptable with Qualification	Not Acceptable
Holding Times		√	
Sample Condition Upon Receipt	√		
Blank Analysis Results		√	

Item Reviewed	Acceptable	Acceptable with Qualification	Not Acceptable
MS/MSD Results	√		
LCS Results	√		
Detection Limits/Sensitivity	√		
Calibrations	√		
Laboratory Duplicate Precision	√		
Field Duplicate Precision	√		
Analytical Sequence	√		
Sample Preparation	√		
Quantitation of Positive Results		√	
Evaluation of Raw Data	√		

Holding Times: All samples were analyzed for total dissolved solids beyond the 7-day holding time from sample preparation (MWMP leaching) to analysis as specified in the method. The reported positive results for total dissolved solids in all samples should be considered estimated and have been flagged "J" on the data tables.

Blank Analysis Results: Alkalinity was observed in the method blank associated with the project samples. The reported positive results for total alkalinity and bicarbonate alkalinity in samples STSB32_6-15 and STSB34_6-15 may be impacted from the method blank contamination. These results should be considered estimated and have been flagged "J" on the data tables.

Fluoride was observed in the method blank associated with the project samples. The reported positive results for fluoride in samples STSB32_0.5-3, STSB33_0.5-3, STSB33-FD_0.5-3, STSB35_0.5-3, and STSB35_6-15 (analyzed at dilutions) may be impacted from the method blank contamination. These results should be considered estimated and have been flagged "J" on the data tables.

Quantitation of Positive Results: All positive results reported at concentrations greater than the MDL, but less than the RL, were qualified as estimated and have been flagged "J" on the data tables.

E. Radiological Analyses

Eleven samples (including QC samples) were analyzed for radium-226 by US EPA Method 903.1 (modified) and for radium-228 by SW-846 Method 9320. The findings offered in this report for this fraction are based on the items on the following table:

Item Reviewed	Acceptable	Acceptable with Qualification	Not Acceptable
Holding Times	√		
Blank Results	√		

Item Reviewed	Acceptable	Acceptable with Qualification	Not Acceptable
LCS Recoveries	√		
Laboratory Duplicate Precision	√		
MS/MSD Results	√		
Chemical Yield	√		
Efficiency Checks	√		
Background Checks	√		
Field Duplicate Precision	√		
Sample Preparation	√		
Quantitation of Results		√	
Evaluation of Raw Data	√		

Quantitation of Results: Based on standard project reporting requirements, all radium-226 and radium-228 results reported at concentrations less than the MDL were qualified as “not-detected” and have been flagged “U” on the data tables.

3.0 Qualifier Summary

A. ICP Metals Analyses

Analyte(s)	SDG(s)	Sample(s)	Validation Qualifier(s)	Reason(s) for Qualification
boron	L56331	All samples	UJ	2 – Method blank contamination
phosphorus	L56331	STSB35_6-15	UJ	4L – Low MS recovery

All positive results reported between the MDL and RL have been flagged “J.” (Valid Reason Code: T)

B. ICP/MS Metals Analyses

All positive results reported between the MDL and RL have been flagged “J.” (Valid Reason Code: T)

C. Mercury Analyses

All positive results reported between the MDL and RL have been flagged “J.” (Valid Reason Code: T)

D. General Chemistry Analyses

Analyte(s)	SDG(s)	Sample(s)	Validation Qualifier(s)	Reason(s) for Qualification
total dissolved solids	L56331	All samples	J	1 – Exceeded holding time
total alkalinity and bicarbonate alkalinity	L56331	STSB32_6-15 and STSB34_6-15	J	9 – Result may be impacted from method blank contamination
fluoride	L56331	STSB32_0.5-3, STSB33_0.5-3, STSB33-FD_0.5-3, STSB35_0.5-3, and STSB35_6-15	J	9 – Result may be impacted from method blank contamination

All positive results reported between the MDL and RL have been flagged “J.” (Valid Reason Code: T)

E. Radiological Analyses

All reported results less than the MDL have been flagged “U.” (Valid Reason Code: 9)

4.0 Overall Assessment

Based on this QA review, the results for boron in all samples were qualified as “not-detected” due to blank contamination. The result for phosphorus in one sample was qualified as estimated due to a low MS recovery. The results for total dissolved solids in all samples were qualified as estimated due to exceeded holding time. The results for total alkalinity, bicarbonate alkalinity, and/or fluoride in several samples were qualified as estimated due to potential impact from blank contamination. All radiological results than the MDL have been flagged as “not-detected”. In addition, several metals and general chemistry results were qualified as estimated because the reported results were between the MDL and the RL.

5.0 Inorganic, General Chemistry, and Radiological Data Qualifiers and Valid Reason Codes

<u>Inorganic, General Chemistry, and Radiological Data Qualifiers</u>

U Analyte not detected at the detection limit concentration.

J Reported value is an estimated concentration.

UJ Analyte not detected at an estimated detection limit concentration.

R These data were rejected and were not used for any purposes.

UR The analyte was not detected. The detection limit is unreliable and may be representative of a false negative. These data were rejected and are not usable for any purpose.

Valid Reason Codes

1	Holding time violation
2	Method blank contamination
3	Surrogate recovery
4	Matrix spike/matrix spike duplicate recovery
5	Matrix spike/matrix spike duplicate precision outside limits
6	Laboratory control sample recovery
7	Field blank contamination
8	Field duplicate precision outside limits
9	Other deficiencies (including cooler temperature)
A	Absence of supporting QC
S	ICV, CCV, or column performance check problem
Y	Initial and continuing calibration blank problem
M	Interference check samples problem
O	Post-digestion spike outside of QC criteria
F	MSA correlation coefficient < 0.995, or MSA not done
G	Serial dilution problem
K	DFTPP or BFB tuning problem
Q	Initial calibration problem
X	Internal standard recovery problem
V	Second-source standard calibration verification problem
L	Low bias
Z	Retention time problem
N	Counting time error (radionuclide chemistry)
W	Detector instability (radionuclide chemistry)
C	Co-elution of compounds
E	Value exceeds linear calibration range
I	Interferences present during analysis
T	Trace-level compound, poor quantitation
P	Dual-column precision outside of limits
B	LCS/LCSD precision outside limits
D	Lab Dup/Rep precision outside limits
H	High bias

6.0 Signatures

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7.0 ANALYTICAL RESULTS

Yerington
SDG: L56331

Lab Sample	L56331-01
Field Sample	STSB32_0.5-3
Collect Date	11/25/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
ASTM D516	14808-79-8	Sulfate	N	Initial	MG/L	2920			120	600		Y
Calculation	14797-55-8_N	Nitrogen, Nitrate as N	N	Initial	MG/L	0.87			0.02	0.1		Y
EPA 351.2	7727-37-9_TKN	Nitrogen, Kjeldahl	N	Initial	MG/L	2.2			0.1	0.5		Y
EPA 353.2	NO3NO2N	Nitrogen, Nitrate/Nitrite (as N)	N	Initial	MG/L	0.87			0.02	0.1		Y
EPA 353.2	14797-65-0_N	Nitrogen, Nitrite as N	N	Initial	MG/L	0.05	U		0.01	0.05		N
EPA 903.1 MOD	13982-63-3	Radium-226	N	Initial	PCI/L	0.9			0.31		0.34	Y
SM 2320B	ALK_CaCO3	Alkalinity as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_BICARB	Alkalinity, Bicarbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_CARB	Alkalinity, Carbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_H	Alkalinity, Hydroxide as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2540C	TDS	Total Dissolved Solids	N	Initial	MG/L	4630	J	1	40	80		Y
SM 4500-Cl E	16887-00-6	Chloride	N	Initial	MG/L	9.9			0.5	2		Y
SM 4500-CN-I	57-12-5_WDC	WEAK ACID DISSOCIABLE CYANIDE	N	Initial	MG/L	0.01	U		0.003	0.01		N
SM 4500-F-C	16984-48-8	Fluoride	N	Initial	MG/L	16	J	9	3	10		Y
SW-846 6010D	7429-90-5	Aluminum	N	Initial	MG/L	27.8			0.05	0.3		Y
SW-846 6010D	7440-39-3	Barium	N	Initial	MG/L	0.024	J	T	0.007	0.04		Y
SW-846 6010D	7440-42-8	Boron	N	Initial	MG/L	0.17	UJ	2	0.17	0.2		N
SW-846 6010D	7440-70-2	Calcium	N	Initial	MG/L	485			0.1	0.5		Y
SW-846 6010D	7439-89-6	Iron	N	Initial	MG/L	5			0.03	0.08		Y
SW-846 6010D	7439-93-2	Lithium	N	Initial	MG/L	0.094			0.008	0.04		Y
SW-846 6010D	7439-95-4	Magnesium	N	Initial	MG/L	199			0.2	1		Y
SW-846 6010D	7723-14-0	Phosphorus	N	Initial	MG/L	1	U		0.2	1		N
SW-846 6010D	7440-09-7	Potassium	N	Initial	MG/L	17.7			0.2	1		Y
SW-846 6010D	7440-23-5	Sodium	N	Initial	MG/L	48.7			0.2	1		Y
SW-846 6010D	7440-24-6	Strontium	N	Initial	MG/L	1.08			0.009	0.05		Y

Lab Sample	L56331-01
Field Sample	STSB32_0.5-3
Collect Date	11/25/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
SW-846 6010D	7440-31-5	Tin	N	Initial	MG/L	0.2	U		0.04	0.2		N
SW-846 6010D	7440-32-6	Titanium	N	Initial	MG/L	0.031			0.005	0.03		Y
SW-846 6020B	7440-36-0	Antimony	N	Initial	MG/L	0.01	U		0.002	0.01		N
SW-846 6020B	7440-38-2	Arsenic	N	Initial	MG/L	0.005			0.001	0.005		Y
SW-846 6020B	7440-41-7	Beryllium	N	Initial	MG/L	0.003			0.0004	0.001		Y
SW-846 6020B	7440-43-9	Cadmium	N	Initial	MG/L	0.009			0.0003	0.001		Y
SW-846 6020B	7440-47-3	Chromium, Total	N	Initial	MG/L	0.01	U		0.003	0.01		N
SW-846 6020B	7440-48-4	Cobalt	N	Initial	MG/L	0.469			0.0003	0.001		Y
SW-846 6020B	7440-50-8	Copper	N	Initial	MG/L	410			0.8	2		Y
SW-846 6020B	7439-92-1	Lead	N	Initial	MG/L	0.003	U		0.0005	0.003		N
SW-846 6020B	7439-96-5	Manganese	N	Initial	MG/L	6.25			0.002	0.01		Y
SW-846 6020B	7439-98-7	Molybdenum	N	Initial	MG/L	0.003	U		0.001	0.003		N
SW-846 6020B	7440-02-0	Nickel	N	Initial	MG/L	0.402			0.002	0.005		Y
SW-846 6020B	7782-49-2	Selenium	N	Initial	MG/L	0.026			0.0005	0.001		Y
SW-846 6020B	7440-22-4	Silver	N	Initial	MG/L	0.003	U		0.0005	0.003		N
SW-846 6020B	7440-28-0	Thallium	N	Initial	MG/L	0.003	J	T	0.0005	0.003		Y
SW-846 6020B	7440-29-1	Thorium	N	Initial	MG/L	0.03	U		0.005	0.03		N
SW-846 6020B	7440-61-1	Uranium	N	Initial	MG/L	0.032			0.0005	0.003		Y
SW-846 6020B	7440-62-2	Vanadium	N	Initial	MG/L	0.01	U		0.003	0.01		N
SW-846 6020B	7440-66-6	Zinc	N	Initial	MG/L	1.43			0.02	0.05		Y
SW-846 7470	7439-97-6	Mercury	N	Initial	MG/L	4E-04	J	T	0.0002	0.001		Y
SW-846 9320	15262-20-1	Radium-228	N	Initial	PCI/L	2.2	U	9	6.1		2.5	N

Lab Sample	L56331-02
Field Sample	STSB32_6-15
Collect Date	11/25/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
ASTM D516	14808-79-8	Sulfate	N	Initial	MG/L	2160			120	600		Y
Calculation	14797-55-8_N	Nitrogen, Nitrate as N	N	Initial	MG/L	0.04	J	T	0.02	0.1		Y
EPA 351.2	7727-37-9_TKN	Nitrogen, Kjeldahl	N	Initial	MG/L	0.5			0.1	0.5		Y
EPA 353.2	NO3NO2N	Nitrogen, Nitrate/Nitrite (as N)	N	Initial	MG/L	0.04	J	T	0.02	0.1		Y
EPA 353.2	14797-65-0_N	Nitrogen, Nitrite as N	N	Initial	MG/L	0.05	U		0.01	0.05		N
EPA 903.1 MOD	13982-63-3	Radium-226	N	Initial	PCI/L	0.71			0.37		0.41	Y
SM 2320B	ALK_CaCO3	Alkalinity as CaCO3	N	Initial	MG/L	3.7	J	9,T	2	20		Y
SM 2320B	ALK_BICARB	Alkalinity, Bicarbonate as CaCO3	N	Initial	MG/L	3.7	J	9,T	2	20		Y
SM 2320B	ALK_CARB	Alkalinity, Carbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_H	Alkalinity, Hydroxide as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2540C	TDS	Total Dissolved Solids	N	Initial	MG/L	3290	J	1	20	40		Y
SM 4500-Cl E	16887-00-6	Chloride	N	Initial	MG/L	17.1			0.5	2		Y
SM 4500-CN-I	57-12-5_WDC	WEAK ACID DISSOCIABLE CYANIDE	N	Initial	MG/L	0.01	U		0.003	0.01		N
SM 4500-F-C	16984-48-8	Fluoride	N	Initial	MG/L	11.7			0.7	2		Y
SW-846 6010D	7429-90-5	Aluminum	N	Initial	MG/L	5.67			0.05	0.3		Y
SW-846 6010D	7440-39-3	Barium	N	Initial	MG/L	0.017	J	T	0.007	0.04		Y
SW-846 6010D	7440-42-8	Boron	N	Initial	MG/L	0.19	UJ	2	0.19	0.2		N
SW-846 6010D	7440-70-2	Calcium	N	Initial	MG/L	524			0.2	1		Y
SW-846 6010D	7439-89-6	Iron	N	Initial	MG/L	0.08	U		0.03	0.08		N
SW-846 6010D	7439-93-2	Lithium	N	Initial	MG/L	0.082			0.008	0.04		Y
SW-846 6010D	7439-95-4	Magnesium	N	Initial	MG/L	139			0.2	1		Y
SW-846 6010D	7723-14-0	Phosphorus	N	Initial	MG/L	0.5	U		0.1	0.5		N
SW-846 6010D	7440-09-7	Potassium	N	Initial	MG/L	44.7			0.2	1		Y
SW-846 6010D	7440-23-5	Sodium	N	Initial	MG/L	81.8			0.2	1		Y
SW-846 6010D	7440-24-6	Strontium	N	Initial	MG/L	3.27			0.009	0.05		Y

Lab Sample	L56331-02
Field Sample	STSB32_6-15
Collect Date	11/25/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
SW-846 6010D	7440-31-5	Tin	N	Initial	MG/L	0.2	U		0.04	0.2		N
SW-846 6010D	7440-32-6	Titanium	N	Initial	MG/L	0.021	J	T	0.005	0.03		Y
SW-846 6020B	7440-36-0	Antimony	N	Initial	MG/L	0.004	U		0.0008	0.004		N
SW-846 6020B	7440-38-2	Arsenic	N	Initial	MG/L	0.0016	J	T	0.0004	0.002		Y
SW-846 6020B	7440-41-7	Beryllium	N	Initial	MG/L	0.0018			0.0002	0.0005		Y
SW-846 6020B	7440-43-9	Cadmium	N	Initial	MG/L	0.0052			0.0001	0.0005		Y
SW-846 6020B	7440-47-3	Chromium, Total	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-48-4	Cobalt	N	Initial	MG/L	0.44			0.0001	0.0005		Y
SW-846 6020B	7440-50-8	Copper	N	Initial	MG/L	55.2			0.2	0.4		Y
SW-846 6020B	7439-92-1	Lead	N	Initial	MG/L	0.0013			0.0002	0.001		Y
SW-846 6020B	7439-96-5	Manganese	N	Initial	MG/L	9.49			0.08	0.4		Y
SW-846 6020B	7439-98-7	Molybdenum	N	Initial	MG/L	0.0012			0.0004	0.001		Y
SW-846 6020B	7440-02-0	Nickel	N	Initial	MG/L	0.233			0.0008	0.002		Y
SW-846 6020B	7782-49-2	Selenium	N	Initial	MG/L	0.0518			0.0002	0.0005		Y
SW-846 6020B	7440-22-4	Silver	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 6020B	7440-28-0	Thallium	N	Initial	MG/L	0.0007	J	T	0.0002	0.001		Y
SW-846 6020B	7440-29-1	Thorium	N	Initial	MG/L	0.01	U		0.002	0.01		N
SW-846 6020B	7440-61-1	Uranium	N	Initial	MG/L	0.0243			0.0002	0.001		Y
SW-846 6020B	7440-62-2	Vanadium	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-66-6	Zinc	N	Initial	MG/L	0.451			0.008	0.02		Y
SW-846 7470	7439-97-6	Mercury	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 9320	15262-20-1	Radium-228	N	Initial	PCI/L	4.9	U	9	5.8		2.4	N

Lab Sample	L56331-03
Field Sample	STSB34_0.5-3
Collect Date	11/25/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
ASTM D516	14808-79-8	Sulfate	N	Initial	MG/L	1890			120	600		Y
Calculation	14797-55-8_N	Nitrogen, Nitrate as N	N	Initial	MG/L	0.26			0.02	0.1		Y
EPA 351.2	7727-37-9_TKN	Nitrogen, Kjeldahl	N	Initial	MG/L	1.8			0.1	0.5		Y
EPA 353.2	NO3NO2N	Nitrogen, Nitrate/Nitrite (as N)	N	Initial	MG/L	0.26			0.02	0.1		Y
EPA 353.2	14797-65-0_N	Nitrogen, Nitrite as N	N	Initial	MG/L	0.05	U		0.01	0.05		N
EPA 903.1 MOD	13982-63-3	Radium-226	N	Initial	PCI/L	1.2			0.4		0.39	Y
SM 2320B	ALK_CaCO3	Alkalinity as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_BICARB	Alkalinity, Bicarbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_CARB	Alkalinity, Carbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_H	Alkalinity, Hydroxide as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2540C	TDS	Total Dissolved Solids	N	Initial	MG/L	2780	J	1	20	40		Y
SM 4500-Cl E	16887-00-6	Chloride	N	Initial	MG/L	1.8	J	T	0.5	2		Y
SM 4500-CN-I	57-12-5_WDC	WEAK ACID DISSOCIABLE CYANIDE	N	Initial	MG/L	0.01	U		0.003	0.01		N
SM 4500-F-C	16984-48-8	Fluoride	N	Initial	MG/L	4.4			0.6	2		Y
SW-846 6010D	7429-90-5	Aluminum	N	Initial	MG/L	4.32			0.05	0.3		Y
SW-846 6010D	7440-39-3	Barium	N	Initial	MG/L	0.018	J	T	0.007	0.04		Y
SW-846 6010D	7440-42-8	Boron	N	Initial	MG/L	0.14	UJ	2	0.14	0.2		N
SW-846 6010D	7440-70-2	Calcium	N	Initial	MG/L	533			0.2	1		Y
SW-846 6010D	7439-89-6	Iron	N	Initial	MG/L	0.06	J	T	0.03	0.08		Y
SW-846 6010D	7439-93-2	Lithium	N	Initial	MG/L	0.038	J	T	0.008	0.04		Y
SW-846 6010D	7439-95-4	Magnesium	N	Initial	MG/L	78.3			0.2	1		Y
SW-846 6010D	7723-14-0	Phosphorus	N	Initial	MG/L	0.5	U		0.1	0.5		N
SW-846 6010D	7440-09-7	Potassium	N	Initial	MG/L	21.1			0.2	1		Y
SW-846 6010D	7440-23-5	Sodium	N	Initial	MG/L	13.7			0.4	2		Y
SW-846 6010D	7440-24-6	Strontium	N	Initial	MG/L	1.85			0.009	0.05		Y

Lab Sample	L56331-03
Field Sample	STSB34_0.5-3
Collect Date	11/25/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
SW-846 6010D	7440-31-5	Tin	N	Initial	MG/L	0.2	U		0.04	0.2		N
SW-846 6010D	7440-32-6	Titanium	N	Initial	MG/L	0.021	J	T	0.005	0.03		Y
SW-846 6020B	7440-36-0	Antimony	N	Initial	MG/L	0.0009	J	T	0.0008	0.004		Y
SW-846 6020B	7440-38-2	Arsenic	N	Initial	MG/L	0.0018	J	T	0.0004	0.002		Y
SW-846 6020B	7440-41-7	Beryllium	N	Initial	MG/L	0.0008			0.0002	0.0005		Y
SW-846 6020B	7440-43-9	Cadmium	N	Initial	MG/L	0.0016			0.0001	0.0005		Y
SW-846 6020B	7440-47-3	Chromium, Total	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-48-4	Cobalt	N	Initial	MG/L	0.0762			0.0001	0.0005		Y
SW-846 6020B	7440-50-8	Copper	N	Initial	MG/L	65			0.2	0.4		Y
SW-846 6020B	7439-92-1	Lead	N	Initial	MG/L	0.0004	J	T	0.0002	0.001		Y
SW-846 6020B	7439-96-5	Manganese	N	Initial	MG/L	1.05			0.0008	0.004		Y
SW-846 6020B	7439-98-7	Molybdenum	N	Initial	MG/L	0.001	U		0.0004	0.001		N
SW-846 6020B	7440-02-0	Nickel	N	Initial	MG/L	0.084			0.0008	0.002		Y
SW-846 6020B	7782-49-2	Selenium	N	Initial	MG/L	0.0026			0.0002	0.0005		Y
SW-846 6020B	7440-22-4	Silver	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 6020B	7440-28-0	Thallium	N	Initial	MG/L	0.0005	J	T	0.0002	0.001		Y
SW-846 6020B	7440-29-1	Thorium	N	Initial	MG/L	0.01	U		0.002	0.01		N
SW-846 6020B	7440-61-1	Uranium	N	Initial	MG/L	0.004			0.0002	0.001		Y
SW-846 6020B	7440-62-2	Vanadium	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-66-6	Zinc	N	Initial	MG/L	0.24			0.008	0.02		Y
SW-846 7470	7439-97-6	Mercury	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 9320	15262-20-1	Radium-228	N	Initial	PCI/L	3.1	U	9	6.6		2.8	N

Lab Sample	L56331-04
Field Sample	STSB34_6-15
Collect Date	11/25/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
ASTM D516	14808-79-8	Sulfate	N	Initial	MG/L	2470			120	600		Y
Calculation	14797-55-8_N	Nitrogen, Nitrate as N	N	Initial	MG/L	0.24			0.02	0.1		Y
EPA 351.2	7727-37-9_TKN	Nitrogen, Kjeldahl	N	Initial	MG/L	0.6			0.1	0.5		Y
EPA 353.2	NO3NO2N	Nitrogen, Nitrate/Nitrite (as N)	N	Initial	MG/L	0.24			0.02	0.1		Y
EPA 353.2	14797-65-0_N	Nitrogen, Nitrite as N	N	Initial	MG/L	0.05	U		0.01	0.05		N
EPA 903.1 MOD	13982-63-3	Radium-226	N	Initial	PCI/L	1.6			0.42		0.36	Y
SM 2320B	ALK_CaCO3	Alkalinity as CaCO3	N	Initial	MG/L	2.4	J	9,T	2	20		Y
SM 2320B	ALK_BICARB	Alkalinity, Bicarbonate as CaCO3	N	Initial	MG/L	2.4	J	9,T	2	20		Y
SM 2320B	ALK_CARB	Alkalinity, Carbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_H	Alkalinity, Hydroxide as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2540C	TDS	Total Dissolved Solids	N	Initial	MG/L	3810	J	1	20	40		Y
SM 4500-Cl E	16887-00-6	Chloride	N	Initial	MG/L	23.6			0.5	2		Y
SM 4500-CN-I	57-12-5_WDC	WEAK ACID DISSOCIABLE CYANIDE	N	Initial	MG/L	0.01	U		0.003	0.01		N
SM 4500-F-C	16984-48-8	Fluoride	N	Initial	MG/L	25			2	7		Y
SW-846 6010D	7429-90-5	Aluminum	N	Initial	MG/L	16.4			0.05	0.3		Y
SW-846 6010D	7440-39-3	Barium	N	Initial	MG/L	0.019	J	T	0.007	0.04		Y
SW-846 6010D	7440-42-8	Boron	N	Initial	MG/L	0.23	UJ	2	0.23	0.23		N
SW-846 6010D	7440-70-2	Calcium	N	Initial	MG/L	518			0.2	1		Y
SW-846 6010D	7439-89-6	Iron	N	Initial	MG/L	0.08	U		0.03	0.08		N
SW-846 6010D	7439-93-2	Lithium	N	Initial	MG/L	0.166			0.008	0.04		Y
SW-846 6010D	7439-95-4	Magnesium	N	Initial	MG/L	185			0.2	1		Y
SW-846 6010D	7723-14-0	Phosphorus	N	Initial	MG/L	0.5	U		0.1	0.5		N
SW-846 6010D	7440-09-7	Potassium	N	Initial	MG/L	63.4			0.2	1		Y
SW-846 6010D	7440-23-5	Sodium	N	Initial	MG/L	116			0.2	1		Y
SW-846 6010D	7440-24-6	Strontium	N	Initial	MG/L	4.01			0.009	0.05		Y

Lab Sample	L56331-04
Field Sample	STSB34_6-15
Collect Date	11/25/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
SW-846 6010D	7440-31-5	Tin	N	Initial	MG/L	0.2	U		0.04	0.2		N
SW-846 6010D	7440-32-6	Titanium	N	Initial	MG/L	0.021	J	T	0.005	0.03		Y
SW-846 6020B	7440-36-0	Antimony	N	Initial	MG/L	0.004	U		0.0008	0.004		N
SW-846 6020B	7440-38-2	Arsenic	N	Initial	MG/L	0.0025			0.0004	0.002		Y
SW-846 6020B	7440-41-7	Beryllium	N	Initial	MG/L	0.0049			0.0002	0.0005		Y
SW-846 6020B	7440-43-9	Cadmium	N	Initial	MG/L	0.0059			0.0001	0.0005		Y
SW-846 6020B	7440-47-3	Chromium, Total	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-48-4	Cobalt	N	Initial	MG/L	0.69			0.0001	0.0005		Y
SW-846 6020B	7440-50-8	Copper	N	Initial	MG/L	81.8			0.2	0.4		Y
SW-846 6020B	7439-92-1	Lead	N	Initial	MG/L	0.0004	J	T	0.0002	0.001		Y
SW-846 6020B	7439-96-5	Manganese	N	Initial	MG/L	15.9			0.08	0.4		Y
SW-846 6020B	7439-98-7	Molybdenum	N	Initial	MG/L	0.0011			0.0004	0.001		Y
SW-846 6020B	7440-02-0	Nickel	N	Initial	MG/L	0.395			0.0008	0.002		Y
SW-846 6020B	7782-49-2	Selenium	N	Initial	MG/L	0.104			0.0002	0.0005		Y
SW-846 6020B	7440-22-4	Silver	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 6020B	7440-28-0	Thallium	N	Initial	MG/L	0.0003	J	T	0.0002	0.001		Y
SW-846 6020B	7440-29-1	Thorium	N	Initial	MG/L	0.01	U		0.002	0.01		N
SW-846 6020B	7440-61-1	Uranium	N	Initial	MG/L	0.0382			0.0002	0.001		Y
SW-846 6020B	7440-62-2	Vanadium	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-66-6	Zinc	N	Initial	MG/L	0.54			0.008	0.02		Y
SW-846 7470	7439-97-6	Mercury	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 9320	15262-20-1	Radium-228	N	Initial	PCI/L	4.8	U	9	5.7		2.8	N

Lab Sample	L56331-05
Field Sample	STSB33_0.5-3
Collect Date	12/3/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
ASTM D516	14808-79-8	Sulfate	N	Initial	MG/L	2210			120	600		Y
Calculation	14797-55-8_N	Nitrogen, Nitrate as N	N	Initial	MG/L	0.41			0.02	0.1		Y
EPA 351.2	7727-37-9_TKN	Nitrogen, Kjeldahl	N	Initial	MG/L	1.3			0.1	0.5		Y
EPA 353.2	NO3NO2N	Nitrogen, Nitrate/Nitrite (as N)	N	Initial	MG/L	0.41			0.02	0.1		Y
EPA 353.2	14797-65-0_N	Nitrogen, Nitrite as N	N	Initial	MG/L	0.05	U		0.01	0.05		N
EPA 903.1 MOD	13982-63-3	Radium-226	N	Initial	PCI/L	1.2			0.5		0.42	Y
SM 2320B	ALK_CaCO3	Alkalinity as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_BICARB	Alkalinity, Bicarbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_CARB	Alkalinity, Carbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_H	Alkalinity, Hydroxide as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2540C	TDS	Total Dissolved Solids	N	Initial	MG/L	3390	J	1	20	40		Y
SM 4500-Cl E	16887-00-6	Chloride	N	Initial	MG/L	3.7			0.5	2		Y
SM 4500-CN-I	57-12-5_WDC	WEAK ACID DISSOCIABLE CYANIDE	N	Initial	MG/L	0.01	U		0.003	0.01		N
SM 4500-F-C	16984-48-8	Fluoride	N	Initial	MG/L	18	J	9	3	10		Y
SW-846 6010D	7429-90-5	Aluminum	N	Initial	MG/L	27.5			0.05	0.3		Y
SW-846 6010D	7440-39-3	Barium	N	Initial	MG/L	0.015	J	T	0.007	0.04		Y
SW-846 6010D	7440-42-8	Boron	N	Initial	MG/L	0.12	UJ	2	0.12	0.12		N
SW-846 6010D	7440-70-2	Calcium	N	Initial	MG/L	497			0.1	0.5		Y
SW-846 6010D	7439-89-6	Iron	N	Initial	MG/L	0.17			0.03	0.08		Y
SW-846 6010D	7439-93-2	Lithium	N	Initial	MG/L	0.219			0.008	0.04		Y
SW-846 6010D	7439-95-4	Magnesium	N	Initial	MG/L	97.3			0.2	1		Y
SW-846 6010D	7723-14-0	Phosphorus	N	Initial	MG/L	0.5	U		0.1	0.5		N
SW-846 6010D	7440-09-7	Potassium	N	Initial	MG/L	6.9			0.2	1		Y
SW-846 6010D	7440-23-5	Sodium	N	Initial	MG/L	24.2			0.2	1		Y
SW-846 6010D	7440-24-6	Strontium	N	Initial	MG/L	0.965			0.009	0.05		Y

Lab Sample	L56331-05
Field Sample	STSB33_0.5-3
Collect Date	12/3/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
SW-846 6010D	7440-31-5	Tin	N	Initial	MG/L	0.2	U		0.04	0.2		N
SW-846 6010D	7440-32-6	Titanium	N	Initial	MG/L	0.024	J	T	0.005	0.03		Y
SW-846 6020B	7440-36-0	Antimony	N	Initial	MG/L	0.004	U		0.0008	0.004		N
SW-846 6020B	7440-38-2	Arsenic	N	Initial	MG/L	0.0048			0.0004	0.002		Y
SW-846 6020B	7440-41-7	Beryllium	N	Initial	MG/L	0.007			0.0002	0.0005		Y
SW-846 6020B	7440-43-9	Cadmium	N	Initial	MG/L	0.0036			0.0001	0.0005		Y
SW-846 6020B	7440-47-3	Chromium, Total	N	Initial	MG/L	0.001	J	T	0.001	0.004		Y
SW-846 6020B	7440-48-4	Cobalt	N	Initial	MG/L	0.511			0.0001	0.0005		Y
SW-846 6020B	7440-50-8	Copper	N	Initial	MG/L	170			0.4	1		Y
SW-846 6020B	7439-92-1	Lead	N	Initial	MG/L	0.0007	J	T	0.0002	0.001		Y
SW-846 6020B	7439-96-5	Manganese	N	Initial	MG/L	5.3			0.2	1		Y
SW-846 6020B	7439-98-7	Molybdenum	N	Initial	MG/L	0.001	U		0.0004	0.001		N
SW-846 6020B	7440-02-0	Nickel	N	Initial	MG/L	0.314			0.0008	0.002		Y
SW-846 6020B	7782-49-2	Selenium	N	Initial	MG/L	0.0192			0.0002	0.0005		Y
SW-846 6020B	7440-22-4	Silver	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 6020B	7440-28-0	Thallium	N	Initial	MG/L	0.0003	J	T	0.0002	0.001		Y
SW-846 6020B	7440-29-1	Thorium	N	Initial	MG/L	0.01	U		0.002	0.01		N
SW-846 6020B	7440-61-1	Uranium	N	Initial	MG/L	0.0505			0.0002	0.001		Y
SW-846 6020B	7440-62-2	Vanadium	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-66-6	Zinc	N	Initial	MG/L	0.503			0.008	0.02		Y
SW-846 7470	7439-97-6	Mercury	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 9320	15262-20-1	Radium-228	N	Initial	PCI/L	0.64	U	9	5.1		2.1	N

Lab Sample	L56331-06
Field Sample	STSB33_6-15
Collect Date	12/3/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
ASTM D516	14808-79-8	Sulfate	N	Initial	MG/L	688			20	100		Y
Calculation	14797-55-8_N	Nitrogen, Nitrate as N	N	Initial	MG/L	0.05	J	T	0.02	0.1		Y
EPA 351.2	7727-37-9_TKN	Nitrogen, Kjeldahl	N	Initial	MG/L	0.5	U		0.1	0.5		N
EPA 353.2	NO3NO2N	Nitrogen, Nitrate/Nitrite (as N)	N	Initial	MG/L	0.05	J	T	0.02	0.1		Y
EPA 353.2	14797-65-0_N	Nitrogen, Nitrite as N	N	Initial	MG/L	0.05	U		0.01	0.05		N
EPA 903.1 MOD	13982-63-3	Radium-226	N	Initial	PCI/L	1.2			0.1		0.31	Y
SM 2320B	ALK_CaCO3	Alkalinity as CaCO3	N	Initial	MG/L	60.7			2	20		Y
SM 2320B	ALK_BICARB	Alkalinity, Bicarbonate as CaCO3	N	Initial	MG/L	60.7			2	20		Y
SM 2320B	ALK_CARB	Alkalinity, Carbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_H	Alkalinity, Hydroxide as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2540C	TDS	Total Dissolved Solids	N	Initial	MG/L	1110	J	1	20	40		Y
SM 4500-Cl E	16887-00-6	Chloride	N	Initial	MG/L	12.6			0.5	2		Y
SM 4500-CN-I	57-12-5_WDC	WEAK ACID DISSOCIABLE CYANIDE	N	Initial	MG/L	0.01	U		0.003	0.01		N
SM 4500-F-C	16984-48-8	Fluoride	N	Initial	MG/L	3.3			0.1	0.4		Y
SW-846 6010D	7429-90-5	Aluminum	N	Initial	MG/L	0.3	U		0.05	0.3		N
SW-846 6010D	7440-39-3	Barium	N	Initial	MG/L	0.017	J	T	0.007	0.04		Y
SW-846 6010D	7440-42-8	Boron	N	Initial	MG/L	0.16	UJ	2	0.16	0.16		N
SW-846 6010D	7440-70-2	Calcium	N	Initial	MG/L	216			0.1	0.5		Y
SW-846 6010D	7439-89-6	Iron	N	Initial	MG/L	0.08	U		0.03	0.08		N
SW-846 6010D	7439-93-2	Lithium	N	Initial	MG/L	0.031	J	T	0.008	0.04		Y
SW-846 6010D	7439-95-4	Magnesium	N	Initial	MG/L	18.5			0.2	1		Y
SW-846 6010D	7723-14-0	Phosphorus	N	Initial	MG/L	0.5	U		0.1	0.5		N
SW-846 6010D	7440-09-7	Potassium	N	Initial	MG/L	31.6			0.2	1		Y
SW-846 6010D	7440-23-5	Sodium	N	Initial	MG/L	62			0.2	1		Y
SW-846 6010D	7440-24-6	Strontium	N	Initial	MG/L	1.71			0.009	0.05		Y

Lab Sample	L56331-06
Field Sample	STSB33_6-15
Collect Date	12/3/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
SW-846 6010D	7440-31-5	Tin	N	Initial	MG/L	0.2	U		0.04	0.2		N
SW-846 6010D	7440-32-6	Titanium	N	Initial	MG/L	0.018	J	T	0.005	0.03		Y
SW-846 6020B	7440-36-0	Antimony	N	Initial	MG/L	0.001	J	T	0.0004	0.002		Y
SW-846 6020B	7440-38-2	Arsenic	N	Initial	MG/L	0.0009	J	T	0.0002	0.001		Y
SW-846 6020B	7440-41-7	Beryllium	N	Initial	MG/L	0.0003	U		8E-05	0.0003		N
SW-846 6020B	7440-43-9	Cadmium	N	Initial	MG/L	8E-05	J	T	5E-05	0.0003		Y
SW-846 6020B	7440-47-3	Chromium, Total	N	Initial	MG/L	0.002	U		0.0005	0.002		N
SW-846 6020B	7440-48-4	Cobalt	N	Initial	MG/L	0.0038			5E-05	0.0003		Y
SW-846 6020B	7440-50-8	Copper	N	Initial	MG/L	0.023			0.004	0.01		Y
SW-846 6020B	7439-92-1	Lead	N	Initial	MG/L	0.0005	U		0.0001	0.0005		N
SW-846 6020B	7439-96-5	Manganese	N	Initial	MG/L	0.62			0.0004	0.002		Y
SW-846 6020B	7439-98-7	Molybdenum	N	Initial	MG/L	0.0556			0.0002	0.0005		Y
SW-846 6020B	7440-02-0	Nickel	N	Initial	MG/L	0.003			0.0004	0.001		Y
SW-846 6020B	7782-49-2	Selenium	N	Initial	MG/L	0.026			0.0001	0.0003		Y
SW-846 6020B	7440-22-4	Silver	N	Initial	MG/L	0.0005	U		0.0001	0.0005		N
SW-846 6020B	7440-28-0	Thallium	N	Initial	MG/L	0.0005	U		0.0001	0.0005		N
SW-846 6020B	7440-29-1	Thorium	N	Initial	MG/L	0.005	U		0.001	0.005		N
SW-846 6020B	7440-61-1	Uranium	N	Initial	MG/L	0.103			0.0001	0.0005		Y
SW-846 6020B	7440-62-2	Vanadium	N	Initial	MG/L	0.002	U		0.0005	0.002		N
SW-846 6020B	7440-66-6	Zinc	N	Initial	MG/L	0.01	U		0.004	0.01		N
SW-846 7470	7439-97-6	Mercury	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 9320	15262-20-1	Radium-228	N	Initial	PCI/L	-0.07	U	9	6.4		2.4	N

Lab Sample	L56331-07
Field Sample	STSB33-FD_0.5-3
Collect Date	12/3/2019
Type	FD
Parent	STSB33_0.5-3

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
ASTM D516	14808-79-8	Sulfate	N	Initial	MG/L	2110			120	600		Y
Calculation	14797-55-8_N	Nitrogen, Nitrate as N	N	Initial	MG/L	0.35			0.02	0.1		Y
EPA 351.2	7727-37-9_TKN	Nitrogen, Kjeldahl	N	Initial	MG/L	1			0.1	0.5		Y
EPA 353.2	NO3NO2N	Nitrogen, Nitrate/Nitrite (as N)	N	Initial	MG/L	0.35			0.02	0.1		Y
EPA 353.2	14797-65-0_N	Nitrogen, Nitrite as N	N	Initial	MG/L	0.05	U		0.01	0.05		N
EPA 903.1 MOD	13982-63-3	Radium-226	N	Initial	PCI/L	0.79			0.36		0.36	Y
SM 2320B	ALK_CaCO3	Alkalinity as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_BICARB	Alkalinity, Bicarbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_CARB	Alkalinity, Carbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_H	Alkalinity, Hydroxide as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2540C	TDS	Total Dissolved Solids	N	Initial	MG/L	3310	J	1	20	40		Y
SM 4500-Cl E	16887-00-6	Chloride	N	Initial	MG/L	4.3			0.5	2		Y
SM 4500-CN-I	57-12-5_WDC	WEAK ACID DISSOCIABLE CYANIDE	N	Initial	MG/L	0.01	U		0.003	0.01		N
SM 4500-F-C	16984-48-8	Fluoride	N	Initial	MG/L	17	J	9	3	9		Y
SW-846 6010D	7429-90-5	Aluminum	N	Initial	MG/L	22.5			0.05	0.3		Y
SW-846 6010D	7440-39-3	Barium	N	Initial	MG/L	0.017	J	T	0.007	0.04		Y
SW-846 6010D	7440-42-8	Boron	N	Initial	MG/L	0.12	UJ	2	0.12	0.2		N
SW-846 6010D	7440-70-2	Calcium	N	Initial	MG/L	520			0.2	1		Y
SW-846 6010D	7439-89-6	Iron	N	Initial	MG/L	0.12			0.03	0.08		Y
SW-846 6010D	7439-93-2	Lithium	N	Initial	MG/L	0.303			0.008	0.04		Y
SW-846 6010D	7439-95-4	Magnesium	N	Initial	MG/L	101			0.2	1		Y
SW-846 6010D	7723-14-0	Phosphorus	N	Initial	MG/L	0.5	U		0.1	0.5		N
SW-846 6010D	7440-09-7	Potassium	N	Initial	MG/L	7.9			0.2	1		Y
SW-846 6010D	7440-23-5	Sodium	N	Initial	MG/L	25.9			0.4	2		Y
SW-846 6010D	7440-24-6	Strontium	N	Initial	MG/L	1.14			0.009	0.05		Y

Lab Sample	L56331-07
Field Sample	STSB33-FD_0.5-3
Collect Date	12/3/2019
Type	FD
Parent	STSB33_0.5-3

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
SW-846 6010D	7440-31-5	Tin	N	Initial	MG/L	0.2	U		0.04	0.2		N
SW-846 6010D	7440-32-6	Titanium	N	Initial	MG/L	0.022	J	T	0.005	0.03		Y
SW-846 6020B	7440-36-0	Antimony	N	Initial	MG/L	0.004	U		0.0008	0.004		N
SW-846 6020B	7440-38-2	Arsenic	N	Initial	MG/L	0.0043			0.0004	0.002		Y
SW-846 6020B	7440-41-7	Beryllium	N	Initial	MG/L	0.0052			0.0002	0.0005		Y
SW-846 6020B	7440-43-9	Cadmium	N	Initial	MG/L	0.0033			0.0001	0.0005		Y
SW-846 6020B	7440-47-3	Chromium, Total	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-48-4	Cobalt	N	Initial	MG/L	0.493			0.0001	0.0005		Y
SW-846 6020B	7440-50-8	Copper	N	Initial	MG/L	156			0.4	1		Y
SW-846 6020B	7439-92-1	Lead	N	Initial	MG/L	0.0005	J	T	0.0002	0.001		Y
SW-846 6020B	7439-96-5	Manganese	N	Initial	MG/L	5.1			0.2	1		Y
SW-846 6020B	7439-98-7	Molybdenum	N	Initial	MG/L	0.001	U		0.0004	0.001		N
SW-846 6020B	7440-02-0	Nickel	N	Initial	MG/L	0.3			0.0008	0.002		Y
SW-846 6020B	7782-49-2	Selenium	N	Initial	MG/L	0.0174			0.0002	0.0005		Y
SW-846 6020B	7440-22-4	Silver	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 6020B	7440-28-0	Thallium	N	Initial	MG/L	0.0003	J	T	0.0002	0.001		Y
SW-846 6020B	7440-29-1	Thorium	N	Initial	MG/L	0.01	U		0.002	0.01		N
SW-846 6020B	7440-61-1	Uranium	N	Initial	MG/L	0.0361			0.0002	0.001		Y
SW-846 6020B	7440-62-2	Vanadium	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-66-6	Zinc	N	Initial	MG/L	0.487			0.008	0.02		Y
SW-846 7470	7439-97-6	Mercury	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 9320	15262-20-1	Radium-228	N	Initial	PCI/L	3	U	9	5.9		2.4	N

Lab Sample	L56331-08
Field Sample	STSB35_0.5-3
Collect Date	12/3/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
ASTM D516	14808-79-8	Sulfate	N	Initial	MG/L	1940			120	600		Y
Calculation	14797-55-8_N	Nitrogen, Nitrate as N	N	Initial	MG/L	0.31			0.02	0.1		Y
EPA 351.2	7727-37-9_TKN	Nitrogen, Kjeldahl	N	Initial	MG/L	0.6			0.1	0.5		Y
EPA 353.2	NO3NO2N	Nitrogen, Nitrate/Nitrite (as N)	N	Initial	MG/L	0.31			0.02	0.1		Y
EPA 353.2	14797-65-0_N	Nitrogen, Nitrite as N	N	Initial	MG/L	0.05	U		0.01	0.05		N
EPA 903.1 MOD	13982-63-3	Radium-226	N	Initial	PCI/L	1.4			0.32		0.4	Y
SM 2320B	ALK_CaCO3	Alkalinity as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_BICARB	Alkalinity, Bicarbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_CARB	Alkalinity, Carbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_H	Alkalinity, Hydroxide as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2540C	TDS	Total Dissolved Solids	N	Initial	MG/L	3330	J	1	20	40		Y
SM 4500-Cl E	16887-00-6	Chloride	N	Initial	MG/L	3.8			0.5	2		Y
SM 4500-CN-I	57-12-5_WDC	WEAK ACID DISSOCIABLE CYANIDE	N	Initial	MG/L	0.01	U		0.003	0.01		N
SM 4500-F-C	16984-48-8	Fluoride	N	Initial	MG/L	11	J	9	2	7		Y
SW-846 6010D	7429-90-5	Aluminum	N	Initial	MG/L	19.8			0.05	0.3		Y
SW-846 6010D	7440-39-3	Barium	N	Initial	MG/L	0.036	J	T	0.007	0.04		Y
SW-846 6010D	7440-42-8	Boron	N	Initial	MG/L	0.13	UJ	2	0.13	0.2		N
SW-846 6010D	7440-70-2	Calcium	N	Initial	MG/L	502			0.2	1		Y
SW-846 6010D	7439-89-6	Iron	N	Initial	MG/L	0.59			0.03	0.08		Y
SW-846 6010D	7439-93-2	Lithium	N	Initial	MG/L	0.113			0.008	0.04		Y
SW-846 6010D	7439-95-4	Magnesium	N	Initial	MG/L	114			0.2	1		Y
SW-846 6010D	7723-14-0	Phosphorus	N	Initial	MG/L	0.5	U		0.1	0.5		N
SW-846 6010D	7440-09-7	Potassium	N	Initial	MG/L	24.5			0.2	1		Y
SW-846 6010D	7440-23-5	Sodium	N	Initial	MG/L	22.3			0.4	2		Y
SW-846 6010D	7440-24-6	Strontium	N	Initial	MG/L	2.73			0.009	0.05		Y

Lab Sample	L56331-08
Field Sample	STSB35_0.5-3
Collect Date	12/3/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
SW-846 6010D	7440-31-5	Tin	N	Initial	MG/L	0.2	U		0.04	0.2		N
SW-846 6010D	7440-32-6	Titanium	N	Initial	MG/L	0.024	J	T	0.005	0.03		Y
SW-846 6020B	7440-36-0	Antimony	N	Initial	MG/L	0.0009	J	T	0.0008	0.004		Y
SW-846 6020B	7440-38-2	Arsenic	N	Initial	MG/L	0.0049			0.0004	0.002		Y
SW-846 6020B	7440-41-7	Beryllium	N	Initial	MG/L	0.0029			0.0002	0.0005		Y
SW-846 6020B	7440-43-9	Cadmium	N	Initial	MG/L	0.0023			0.0001	0.0005		Y
SW-846 6020B	7440-47-3	Chromium, Total	N	Initial	MG/L	0.001	J	T	0.001	0.004		Y
SW-846 6020B	7440-48-4	Cobalt	N	Initial	MG/L	0.177			0.0001	0.0005		Y
SW-846 6020B	7440-50-8	Copper	N	Initial	MG/L	183			0.4	1		Y
SW-846 6020B	7439-92-1	Lead	N	Initial	MG/L	0.0003	J	T	0.0002	0.001		Y
SW-846 6020B	7439-96-5	Manganese	N	Initial	MG/L	1.69			0.0008	0.004		Y
SW-846 6020B	7439-98-7	Molybdenum	N	Initial	MG/L	0.001	U		0.0004	0.001		N
SW-846 6020B	7440-02-0	Nickel	N	Initial	MG/L	0.182			0.0008	0.002		Y
SW-846 6020B	7782-49-2	Selenium	N	Initial	MG/L	0.0051			0.0002	0.0005		Y
SW-846 6020B	7440-22-4	Silver	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 6020B	7440-28-0	Thallium	N	Initial	MG/L	0.0007	J	T	0.0002	0.001		Y
SW-846 6020B	7440-29-1	Thorium	N	Initial	MG/L	0.01	U		0.002	0.01		N
SW-846 6020B	7440-61-1	Uranium	N	Initial	MG/L	0.0228			0.0002	0.001		Y
SW-846 6020B	7440-62-2	Vanadium	N	Initial	MG/L	0.004	U		0.001	0.004		N
SW-846 6020B	7440-66-6	Zinc	N	Initial	MG/L	0.429			0.008	0.02		Y
SW-846 7470	7439-97-6	Mercury	N	Initial	MG/L	0.001	U		0.0002	0.001		N
SW-846 9320	15262-20-1	Radium-228	N	Initial	PCI/L	1.8	U	9	5.8		2.5	N

Lab Sample	L56331-09
Field Sample	STSB35_6-15
Collect Date	12/3/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
ASTM D516	14808-79-8	Sulfate	N	Initial	MG/L	3200			120	600		Y
Calculation	14797-55-8_N	Nitrogen, Nitrate as N	N	Initial	MG/L	0.1	U		0.02	0.1		N
EPA 351.2	7727-37-9_TKN	Nitrogen, Kjeldahl	N	Initial	MG/L	1.1			0.1	0.5		Y
EPA 353.2	NO3NO2N	Nitrogen, Nitrate/Nitrite (as N)	N	Initial	MG/L	0.1	U		0.02	0.1		N
EPA 353.2	14797-65-0_N	Nitrogen, Nitrite as N	N	Initial	MG/L	0.05	U		0.01	0.05		N
EPA 903.1 MOD	13982-63-3	Radium-226	N	Initial	PCI/L	1.1			0.32		0.35	Y
SM 2320B	ALK_CaCO3	Alkalinity as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_BICARB	Alkalinity, Bicarbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_CARB	Alkalinity, Carbonate as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2320B	ALK_H	Alkalinity, Hydroxide as CaCO3	N	Initial	MG/L	20	U		2	20		N
SM 2540C	TDS	Total Dissolved Solids	N	Initial	MG/L	4910	J	1	40	80		Y
SM 4500-Cl E	16887-00-6	Chloride	N	Initial	MG/L	6.7			0.5	2		Y
SM 4500-CN-I	57-12-5_WDC	WEAK ACID DISSOCIABLE CYANIDE	N	Initial	MG/L	0.01	U		0.003	0.01		N
SM 4500-F-C	16984-48-8	Fluoride	N	Initial	MG/L	25	J	9	6	20		Y
SW-846 6010D	7429-90-5	Aluminum	N	Initial	MG/L	48.1			0.05	0.3		Y
SW-846 6010D	7440-39-3	Barium	N	Initial	MG/L	0.009	J	T	0.007	0.04		Y
SW-846 6010D	7440-42-8	Boron	N	Initial	MG/L	0.15	UJ	2	0.15	0.2		N
SW-846 6010D	7440-70-2	Calcium	N	Initial	MG/L	471			0.1	0.5		Y
SW-846 6010D	7439-89-6	Iron	N	Initial	MG/L	3.32			0.03	0.08		Y
SW-846 6010D	7439-93-2	Lithium	N	Initial	MG/L	0.091			0.008	0.04		Y
SW-846 6010D	7439-95-4	Magnesium	N	Initial	MG/L	183			0.2	1		Y
SW-846 6010D	7723-14-0	Phosphorus	N	Initial	MG/L	3	UJ	4L	0.5	3		N
SW-846 6010D	7440-09-7	Potassium	N	Initial	MG/L	17.1			0.2	1		Y
SW-846 6010D	7440-23-5	Sodium	N	Initial	MG/L	36.1			0.2	1		Y
SW-846 6010D	7440-24-6	Strontium	N	Initial	MG/L	1.19			0.009	0.05		Y

Lab Sample	L56331-09
Field Sample	STSB35_6-15
Collect Date	12/3/2019
Type	N
Parent	

Method	CAS Number	Chemical Name	TD	Test Type	Units	Result	Qual	Reason	MDL	RDL	Uncert	Detect Flag
SW-846 6010D	7440-31-5	Tin	N	Initial	MG/L	0.2	U		0.04	0.2		N
SW-846 6010D	7440-32-6	Titanium	N	Initial	MG/L	0.033			0.005	0.03		Y
SW-846 6020B	7440-36-0	Antimony	N	Initial	MG/L	0.01	U		0.002	0.01		N
SW-846 6020B	7440-38-2	Arsenic	N	Initial	MG/L	0.005			0.001	0.005		Y
SW-846 6020B	7440-41-7	Beryllium	N	Initial	MG/L	0.0067			0.0004	0.001		Y
SW-846 6020B	7440-43-9	Cadmium	N	Initial	MG/L	0.0076			0.0003	0.001		Y
SW-846 6020B	7440-47-3	Chromium, Total	N	Initial	MG/L	0.006	J	T	0.003	0.01		Y
SW-846 6020B	7440-48-4	Cobalt	N	Initial	MG/L	0.551			0.0003	0.001		Y
SW-846 6020B	7440-50-8	Copper	N	Initial	MG/L	505			2	4		Y
SW-846 6020B	7439-92-1	Lead	N	Initial	MG/L	0.0018	J	T	0.0005	0.003		Y
SW-846 6020B	7439-96-5	Manganese	N	Initial	MG/L	5.02			0.002	0.01		Y
SW-846 6020B	7439-98-7	Molybdenum	N	Initial	MG/L	0.003	U		0.001	0.003		N
SW-846 6020B	7440-02-0	Nickel	N	Initial	MG/L	0.397			0.002	0.005		Y
SW-846 6020B	7782-49-2	Selenium	N	Initial	MG/L	0.0187			0.0005	0.001		Y
SW-846 6020B	7440-22-4	Silver	N	Initial	MG/L	0.003	U		0.0005	0.003		N
SW-846 6020B	7440-28-0	Thallium	N	Initial	MG/L	0.0017	J	T	0.0005	0.003		Y
SW-846 6020B	7440-29-1	Thorium	N	Initial	MG/L	0.03	U		0.005	0.03		N
SW-846 6020B	7440-61-1	Uranium	N	Initial	MG/L	0.133			0.0005	0.003		Y
SW-846 6020B	7440-62-2	Vanadium	N	Initial	MG/L	0.01	U		0.003	0.01		N
SW-846 6020B	7440-66-6	Zinc	N	Initial	MG/L	1.49			0.02	0.05		Y
SW-846 7470	7439-97-6	Mercury	N	Initial	MG/L	0.0007	J	T	0.0002	0.001		Y
SW-846 9320	15262-20-1	Radium-228	N	Initial	PCI/L	-0.5	U	9	5.9		2.1	N

8.0 SUPPORTING DOCUMENTATION

ENVIRONMENTAL STANDARDS

INORGANIC ANALYSIS SUPPORT DOCUMENTATION

Client Name:	ARCO	EnvStd Project Manager:	KV
Site/Project Name:	2020 Yerington DV	Reviewed by:	APB
Job Number/Task/Subtask:	20209110.A000 / 000DV	Approved by:	THW
Laboratory/Location:	ACZ / Steamboat Springs, CO	Completion Date:	7/2020
SDG:	L56331	Validation Level:	IV
Sample Collection Dates:	11/25/2019 & 12/3/2019		

The following table indicates criteria that were examined, the identified problems, and support documentation attachments.

	Criteria Examined in Detail **Note:** All items examined have been included in the Support Document unless otherwise noted.							Problems Identified						
	Check (√) if Yes or Footnote Letter for Comments Below													
Parameter/ Method	Metals – 6010D	Metals – 6020B	Mercury – 7470	WAD – 4500-CN I	Chloride – 4500-Cl E	Fluoride – 4500-F C	Sulfate – D516-07	Metals – 6010D	Metals – 6020B	Mercury – 7470	WAD – 4500-CN I	Chloride – 4500-Cl E	Fluoride – 4500-F C	Sulfate – D516-07
Condition upon Receipt	√	√	√	√	√	√	√							
Sample Preservation	√	√	√	√	√	√	√							
Holding Times	√	√	√	√	√	√	√							
Blank Analysis Results	√	√	√	√	√	√	√	√						
Laboratory Control Sample	√	√	√	√	√	√	√							
Matrix Spike (Pre-Digestion Spike)	√	√	√	√	√	√	√	√						
Laboratory Duplicate				√			√							
Field Duplicate	√	√	√	√	√	√	√							
Total *vs.* Dissolved Results Comparison														
Sample Preparation	√	√	√	√	√	√	√							
Mass Tuning		√												
Initial Calibrations	√	√	√	√	√	√	√							
Continuing Calibrations	√	√	√	√	√	√	√							
Detection Limit/Reporting Limit Standards	√	√	√											
Negative Bias														
Interference Checks	√	√												
Post-Digestion Spike														
Serial Dilution	√	√												
Analytical Sequence	√	√	√	√	√	√	√	√						
Linear Range Analysis	√	√	√											
Interelement Correction Factors														
Detection Limit/Sensitivity	√	√	√	√	√	√	√							
Dilutions														
Internal Standard Performance		√												
Quantitation of Results	√	√	√	√	√	√	√							
Multiple Exposures %RSD														
Percent Solids														
Deliverable was Complete		√	√	√	√	√	√	√						
Others:														

Comments: Quantitation of Results and Multiple Exposures are not included in the Support Documentation unless a problem was identified.

INORGANIC ANALYSIS SUPPORT DOCUMENTATION

Client Name:	ARCO	EnvStd Project Manager:	KV
Site/Project Name:	2020 Yerington DV	Reviewed by:	APB
Job Number/Task/Subtask:	20209110.A000 / 000DV	Approved by:	THW
Laboratory/Location:	ACZ / Steamboat Springs, CO	Completion Date:	7/2020
SDG:	L56331	Validation Level:	IV
Sample Collection Dates:	11/25/2019 & 12/3/2019		

The following table indicates criteria that were examined, the identified problems, and support documentation attachments.

Criteria Examined in Detail

Note: All items examined have been included in the Support Document unless otherwise noted.

Problems Identified

Check (√) if Yes or Footnote Letter for Comments Below

Parameter/ Method	NO_2/NO_3 – 353.2	TKN – 351.2	Alkalinity – 2320B	TDS – 2540C				NO_2/NO_3 – 353.2	TKN – 351.2	Alkalinity – 2320B	TDS – 2540C			
Condition upon Receipt	√	√	√	√										
Sample Preservation	√	√	√	√										
Holding Times	√	√	√	√							√			
Blank Analysis Results	√	√	√	√						√				
Laboratory Control Sample	√	√	√	√										
Matrix Spike (Pre-Digestion Spike)	√	√												
Laboratory Duplicate			√	√										
Field Duplicate	√	√	√	√										
Total *vs.* Dissolved Results Comparison														
Sample Preparation	√	√	√	√										
Mass Tuning														
Initial Calibrations	√	√												
Continuing Calibrations	√	√												
Detection Limit/Reporting Limit Standards	√	√	√	√										
Negative Bias														
Interference Checks														
Post-Digestion Spike														
Serial Dilution														
Analytical Sequence	√	√	√	√										
Linear Range Analysis	√	√												
Interelement Correction Factors														
Detection Limit/Sensitivity	√	√	√	√										
Dilutions														
Internal Standard Performance														
Quantitation of Results	√	√	√	√										
Multiple Exposures %RSD														
Percent Solids														
Deliverable was Complete	√		√	√					√					
Others:														

Comments: Quantitation of Results and Multiple Exposures are not included in the Support Documentation unless a problem was identified.

RADIOLOGICAL ANALYSIS SUPPORT DOCUMENTATION

Client Name:	ARCO	EnvStd Project Manager:	KV
Site/Project Name:	2020 Yerington DV	Reviewed by:	APB
Job Number/Task/Subtask:	20209110.A000 / 000DV	Approved by:	THW
Laboratory/Location:	ACZ / Steamboat Springs, CO	Completion Date:	7/2020
SDG:	L56331	Validation Level:	IV
Sample Collection Dates:	11/25/2019 and 12/3/2019		

The following table indicates criteria that were examined, the identified problems, and support documentation attachments.

	Criteria Examined in Detail **Note:** All items examined have been included in the Support Document unless otherwise noted.							Problems Identified						
	Check (√) if Yes or Footnote Letter for Comments Below													
Parameter/ Method	Ra-226 – 903.1 (mod)	Ra-228 – 904.0						Ra-226 – 903.1 (mod)	Ra-228 – 904.0					
Condition upon Receipt	√	√												
Sample Preservation	√	√												
Holding Times	√	√												
Blank Analysis Results	√	√												
Laboratory Control Sample	√	√												
Tracer/Carrier Yield	√	√												
Laboratory Duplicate	√	√												
Field Duplicate	√	√												
Matrix Spike/Matrix Spike Duplicate														
Sample Preparation	√	√												
Quantitation of Results	√	√												
Detection Limit	√	√												
Efficiency/Energy Calibrations														
Initial Calibration Verifications														
Annual Calibration Verifications														
Continuing Calibration Checks														
Resolution Checks														
Background Checks														
Analytical Sequence	√	√												
Standards Preparation Logs														
Deliverable was Complete														
Others:														

Comments: Quantitation of Results are not included in the Support Documentation unless a problem was identified.

EVALUATION OF INORGANIC FIELD DUPLICATE SAMPLE ANALYSIS PRECISION

Units see below	PRECISION OBJECTIVES*	
	Analyte > or = 5 X RL	RPD < or = 40
	Analyte < 5 X RL	Difference ≤ RL × 2

* Enter the project-specific or default acceptance criteria

ANALYTE	Units	STSB33_0.5-3 Analyte Concentration	Qual	RL	STSB33-FD_0.5-3 Analyte Concentration	Qual	RL	Difference	RPD	Notes
Sulfate	MG/L	2210		600	2110		600	100	NA	IN
Nitrogen, Nitrate as N	MG/L	0.41		0.1	0.35		0.1	0.06	NA	IN
Nitrogen, Kjeldahl	MG/L	1.3		0.5	1		0.5	0.3	NA	IN
Nitrogen, Nitrate/Nitrite (as N)	MG/L	0.41		0.1	0.35		0.1	0.06	NA	IN
Nitrogen, Nitrite as N	MG/L		U	0.05		U	0.05	0	NA	IN
Alkalinity as CaCO3	MG/L		U	20		U	20	0	NA	IN
Alkalinity, Bicarbonate as CaCO3	MG/L		U	20		U	20	0	NA	IN
Alkalinity, Carbonate as CaCO3	MG/L		U	20		U	20	0	NA	IN
Alkalinity, Hydroxide as CaCO3	MG/L		U	20		U	20	0	NA	IN
Total Dissolved Solids	MG/L	3390	H	40	3310	H	40	NA	2.4%	IN
Chloride	MG/L	3.7		2	4.3		2	0.6	NA	IN
WEAK ACID DISSOCIABLE CYANIDE	MG/L		U	0.01		U	0.01	0	NA	IN
Fluoride	MG/L	18		10	17		9	1	NA	IN
Aluminum	MG/L	27.5		0.3	22.5		0.3	NA	20.0%	IN
Barium	MG/L	0.015	B	0.04	0.017	B	0.04	0.002	NA	IN
Boron	MG/L	0.12		0.1	0.12	B	0.2	0	NA	IN
Calcium	MG/L	497		0.5	520		1	NA	4.5%	IN
Iron	MG/L	0.17		0.08	0.12		0.08	0.05	NA	IN
Lithium	MG/L	0.219		0.04	0.303		0.04	NA	32.2%	IN
Magnesium	MG/L	97.3		1	101		1	NA	3.7%	IN
Phosphorus	MG/L		U	0.5		U	0.5	0	NA	IN
Potassium	MG/L	6.9		1	7.9		1	NA	13.5%	IN
Sodium	MG/L	24.2		1	25.9		2	NA	6.8%	IN
Strontium	MG/L	0.965		0.05	1.14		0.05	NA	16.6%	IN
Tin	MG/L		U	0.2		U	0.2	0	NA	IN
Titanium	MG/L	0.024	B	0.03	0.022	B	0.03	0.002	NA	IN
Antimony	MG/L		U	0		U	0	0	NA	IN
Arsenic	MG/L	0.0048		0	0.0043		0	0.0005	NA	IN
Beryllium	MG/L	0.007		0	0.0052		0	NA	29.5%	IN
Cadmium	MG/L	0.0036		0	0.0033		0	NA	8.7%	IN
Chromium, Total	MG/L	0.001	B	0		U	0	0.001	NA	IN
Cobalt	MG/L	0.511		0	0.493		0	NA	3.6%	IN
Copper	MG/L	170		1	156		1	NA	8.6%	IN
Lead	MG/L	0.0007	B	0	0.0005	B	0	0.0002	NA	IN
Manganese	MG/L	5.3		1	5.1		1	NA	3.8%	IN
Molybdenum	MG/L		U	0		U	0	0	NA	IN
Nickel	MG/L	0.314		0	0.3		0	NA	4.6%	IN
Selenium	MG/L	0.0192		0	0.0174		0	NA	9.8%	IN
Silver	MG/L		U	0		U	0	0	NA	IN
Thallium	MG/L	0.0003	B	0	0.0003	B	0	0	NA	IN
Thorium	MG/L		U	0.01		U	0.01	0	NA	IN
Uranium	MG/L	0.0505		0	0.0361		0	NA	33.3%	IN
Vanadium	MG/L		U	0		U	0	0	NA	IN
Zinc	MG/L	0.503		0.02	0.487		0.02	NA	3.2%	IN
Mercury	MG/L		U	0		U	0	0	NA	IN
pH	PH UNITS	4.3		0.1	4.3		0.1	NA	0.0%	IN
pH	PH UNITS	4.1		0.1	4.3		0.1	NA	4.8%	IN
Temp at time of pH analysis	DEG C	19.8		0.1	19.2		0.1	NA	3.1%	IN
Temp at time of pH analysis	DEG C	23.2		0.1	22.9		0.1	NA	1.3%	IN
								NA	#DIV/0!	#DIV/0!
								NA	#DIV/0!	#DIV/0!

NOTES:
Qual) Column to enter J, U, U*, or B
RPD) Relative Percent Difference
RL) Reporting Limit
J) The analyte concentration should be considered estimated.
U) The analyte was not-detected in the sample. The numerical value of the EDL will be used for comparison purposes.
U* or B) The result was blank qualified. The numerical value will be used for comparison purposes.
NA) The RPD or Difference is not applicable.
1) Both results are > or = 5 X RL and RPD over acceptance limit, flag positive results "J".
2) At least one of the results is < 5 X RL and difference is over acceptance limit, flag positive results "J" and "not-detected" re

Comments:

RADIOLOGICAL FIELD DUPLICATE EVALUATION

DUPLICATE ERROR RATIO (DER 2-s) LIMIT < 2

DER = ABS (SAMPLE ACT - DUPLICATE ACT) / SQRT [(TPU 2-s SAMPLE)2 + (TPU 2-s DUP

L56331

Samples: L56331-05 and Dup

Analyte	Sample Act	Sample TPU	Duplicate Act	Duplicate TPU	DER 2-s
radium-226	1.2	0.45	0.79	0.36	1.42

BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

	Blank Type									
	Method									
Matrix (Aq., S.)	ICB	CCB	Prep.	Trip	Equip	Field	Blank Sample Number	Contaminant	Concentration (mg/L)	Qualification limit (5×)
		x					WG489196CCB1	COPPER	0.00223	0.01115
		x					WG489196CCB1	SELENIUM	0.00015	0.00075
		x					WG489196CCB2	COPPER	0.00181	0.00905
		x					WG489196CCB2	SELENIUM	0.00014	0.0007
			x				WG488184PBS	BORON	0.243	1.215
			x				WG488184PBS	CALCIUM	0.52	2.6
			x				WG488184PBS	SODIUM	1.67	8.35

Aq = Aqueous; S = Solid

Notes:

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Revised Analytical Report

June 23, 2020

Report to:
Lynda Lombardi
Wood - E&I Solutions, Inc.
10940 White Rock Road
Suite 190
Rancho Cordova, CA 95670

Bill to:
Ashley Shively
Wood - E&I Solutions, Inc.
10940 White Rock Rd
Ste 190
Rancho Cordova, CA 95670

Project ID:
ACZ Project ID: L56331

Lynda Lombardi:

Enclosed are revised analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 09, 2019 and originally reported on January 15, 2020. Refer to the case narrative for an explanation of the changes. This project was assigned to ACZ's project number, L56331. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L56331. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 14, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

Sue Webber has reviewed and approved this report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Summary

ACZ Project ID: ***L56331***

SAMPLE ID	LAB NO.	SAMPLE DATE	SAMPLE TIME
STSB32_0.5-3 ✓	L56331-01	11/25/2019	13:40 ✓
STSB32_6-15 ✓	L56331-02	11/25/2019	14:06 ✓
STSB34_0.5-3 ✓	L56331-03	11/25/2019	15:05 ✓
STSB34_6-15 ✓	L56331-04	11/25/2019	15:28 ✓
STSB33_0.5-3 ✓	L56331-05	12/3/2019	12:40 ✓
STSB33_6-15 ✓	L56331-06	12/3/2019	13:05 ✓
STSB33-FD_0.5-3 ✓	L56331-07	12/3/2019	12:48 ✓
STSB35_0.5-3 ✓	L56331-08	12/3/2019	14:41 ✓
STSB35_6-15 ✓	L56331-09	12/3/2019	15:00 ✓

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Wood - E&I Solutions, Inc.

ACZ Project ID: L56331
Date Received: 12/09/2019 16:07
Received By:
Date Printed: 12/10/2019

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? [1]			X
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
NA31950	18.1	NA	15	Yes
NA31954	16.1	NA	15	Yes
NA31953	18.9	NA	15	Yes
NA31952	16.2	NA	15	Yes
NA31951	18.3	NA	15	Yes

Was ice present in the shipment container(s)?

No - Wet or gel ice was not present in the shipment container(s).

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Wood - E&I Solutions, Inc.

ACZ Project ID:	L56331
Date Received:	12/09/2019 16:07
Received By:	
Date Printed:	12/10/2019

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

[1] The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na2S2O3 preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

L56331 Chain of Custod
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

L56331

BP/ARC Site Node Path: NV_YERINGTON
BP/ARC Facility Name: Anaconda Copper Mine Site
Req Due Date (mm/dd/yy): _____ **Rush TAT:** Yes ___ No X
Lab Work Order Number: _____

Lab Name:	ACZ Laboratories, Inc.	BP/ARC Facility Address:	1 Austin Circle	Consultant/Contractor:	Wood - E&I Solutions, Inc.
Lab Address:	2773 Downhill Dr, Steamboat Springs, CO, 80487	City, State, ZIP Code:	Yerington, Nevada	Consultant/Contractor Project No:	SA18170340.005.055B
Lab PM:	Sue Webber (suew@acz.com)	Lead Regulatory Agency:	NDEP Abandoned Mine Lands Program	Address:	10940 White Rock Rd, Ste 190, Rancho Cordova, CA 95670
Lab Phone:	970-879-6590	California Global ID No.:		Consultant/Contractor PM:	Kent Parrish
Lab Shipping Accnt:	2897-1804-4 (RC #)	Enfos Proposal No:	Work Release No:	Phone: 916-636-3200	Email: Kent.Parrish@woodplc.com
Lab Bottle Order No:		Accounting Mode:	Provision ___ OOC-BU ___ OOC-RM ___	Email Report/EDD To:	lynda.lombardi@woodplc.com
Other Info:	OU-4b_OU-5_Soil	Stage:	Activity:	Invoice To:	BP/ARC ___ Contractor X
BP/ARC EBM:	Chuck Stilwell				
EBM Phone:	713-998-2443				
EBM Email:	Chuck.Stilwell@bp.com				

Lab No.	Sample Description	Date	Time	Soil / Solid	Water / Liquid	Air / Vapor		Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl			MWMP Metals [1]	MWMP Anions - Cl, F, SO4, NO3+NO2 as N	MWMP TKN as N; WAD CN	MWMP TDS, pH, Alkalinity [2]	MWMP Ra-226/ Ra-228					LD/MS/MSD
	STSB32_0.5-3	11/25/19	1340	X				1	1						X	X	X	X	X					
	STSB32_6-15	11/25/19	1406	X				1	1						X	X	X	X	X					
	STSB34_0.5-3	11/25/19	1505	X				1	1						X	X	X	X	X					
	STSB34_6-15	11/25/19	1528	X	12/03/19			1	1						X	X	X	X	X					
	STSB33_0.5-3	12/03/19	1240	X				1	1						X	X	X	X	X					
	STSB33_6-15	12/03/19	~~1248~~ 1305	X				1	1						X	X	X	X	X					
	STSB33-FD_0.5-3	12/03/19	~~1305~~ 1248	X				1	1						X	X	X	X	X					
	STSB35_0.5-3	12/03/19	1441	X				1	1						X	X	X	X	X					
	STSB35_6-15	12/03/19	1500	X				1	1						X	X	X	X	X					
										JG 12/4/19														

Report Type & QC Level
Standard ___
Full Data Package X

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Analyses to be perfomed on extract following MWMP (E2242)
[1] Metals are: Al, Ba, B, Ca, Fe, K, Li, Mg, Na, P, Sr, Sn, Ti, by SW6010B; As, Be, Cd, Cr, Co, Cu, Pb, Mn, Mo, Ni, Sb, Se, Ag, Th, Tl, U, V, Zn by SW6020; Hg by SW7470A.
[2] Total Alk, Bicarb Alk (as $CaCO_3$)

Sampler's Name: Bryce Johnson
Sampler's Company: Wood
Shipment Method: Fed Ex Ship Date: 12/4/19
Shipment Tracking No: 777150504121/777150526240/

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
[signature] / Wood	12/4/19	1200			

Special Instructions: Use NV approved protocols for MWMP extractions. → 777150542865

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

L56331-20621147 Page 7 of 38

Wood - EI Solutions, Inc. June 23, 2020

Project ID:
ACZ Project ID: L56331

Sample Receipt

ACZ Laboratories, Inc. (ACZ) received 9 miscellaneous samples from Wood - E&I Solutions, Inc. on December 9, 2019. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L56331. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

Holding Times

All analyses were performed within EPA recommended holding times except for parameters flagged with "H" flags (H1, H3, HC), received either after the hold time expired, too close to the hold time or requiring re-analysis after the hold time had expired. For Analytes flagged with an "HD", see the Extended Qualifier Report for more information.

Sample Analysis

These samples were analyzed for inorganic, radiochemistry parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports. The following required further explanation not provided by the Extended Qualifier Report:

This project was revised on 06/22/2020 to include missing raw data for Nitrogen, Total Kjeldahl and Sulfate. No other changes were made.

1. Boron, Sodium (B1) - Target analytes detected in the prep blank (PBS) above the method reporting limit. The MWMT fluid is passed through the analytical column as part of the preparation procedure, resulting in trace contamination of some analytes. Boron contamination in MWMT solution caused the control sample (LFB) to have recovery above method limits.

pH was not validated per an email from Lynda Lombardi, Wood, received on 8/17/2020.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB32_0.5-3

ACZ Sample ID: ***L56331-01***
Date Sampled: *11/25/19 13:40*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Cyanide, WAD (MWMT) Prep	SM4500-CN I		-						01/01/20 11:27	wtc
ICP MWMT Prep	M6010D ICP								12/20/19 11:08	kja
ICPMS MWMT Prep	M6020B ICP-MS								12/28/19 11:22	mfm
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor								01/07/20 11:06	mss2

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum (MWMT)	M6010D ICP	1	27.8 ✓		*	mg/L	0.05	0.3	12/23/19 20:51	kja
Antimony (MWMT)	M6020B ICP-MS	5	<0.002	U		mg/L	0.002	0.01	01/02/20 12:47	mfm
Arsenic (MWMT)	M6020B ICP-MS	5	0.005		*	mg/L	0.001	0.005	01/02/20 12:47	mfm
Barium (MWMT)	M6010D ICP	1	0.024	B		mg/L	0.007	0.04	12/23/19 20:51	kja
Beryllium (MWMT)	M6020B ICP-MS	5	0.0034			mg/L	0.0004	0.001	01/02/20 12:47	mfm
Boron (MWMT)	M6010D ICP	2	✓ 0.17 UJ 2	B	*	mg/L	0.04	0.2	12/26/19 12:25	jlw
Cadmium (MWMT)	M6020B ICP-MS	5	0.0089			mg/L	0.0003	0.001	01/02/20 12:47	mfm
Calcium (MWMT)	M6010D ICP	1	485		*	mg/L	0.1	0.5	12/23/19 20:51	kja
Chromium (MWMT)	M6020B ICP-MS	5	<0.003	U		mg/L	0.003	0.01	01/02/20 12:47	mfm
Cobalt (MWMT)	M6020B ICP-MS	5	0.469		*	mg/L	0.0003	0.001	01/02/20 12:47	mfm
Copper (MWMT)	M6020B ICP-MS	1000	410 ✓		*	mg/L	0.8	2	01/03/20 19:20	bsu
Iron (MWMT)	M6010D ICP	1	5.00			mg/L	0.03	0.08	12/23/19 20:51	kja
Lead (MWMT)	M6020B ICP-MS	5	<0.0005	U		mg/L	0.0005	0.003	01/02/20 12:47	mfm
Lithium (MWMT)	M6010D ICP	1	0.094		*	mg/L	0.008	0.04	12/23/19 20:51	kja
Magnesium (MWMT)	M6010D ICP	1	199 ✓			mg/L	0.2	1	12/23/19 20:51	kja
Manganese (MWMT)	M6020B ICP-MS	5	6.25 ✓		*	mg/L	0.002	0.01	01/02/20 12:47	mfm
Mercury (MWMT)	M7470A CVAA	1	0.0004 ✓	B	*	mg/L	0.0002	0.001	12/20/19 17:57	slm
Molybdenum (MWMT)	M6020B ICP-MS	5	<0.001	U		mg/L	0.001	0.003	01/02/20 12:47	mfm
Nickel (MWMT)	M6020B ICP-MS	5	0.402		*	mg/L	0.002	0.005	01/02/20 12:47	mfm
Phosphorus (MWMT)	M6010D ICP	2	<0.2	U	*	mg/L	0.2	1	12/26/19 12:25	jlw
Potassium (MWMT)	M6010D ICP	1	17.7			mg/L	0.2	1	12/23/19 20:51	kja
Selenium (MWMT)	M6020B ICP-MS	5	0.0258 ✓			mg/L	0.0005	0.001	01/02/20 12:47	mfm
Silver (MWMT)	M6020B ICP-MS	5	<0.0005	U		mg/L	0.0005	0.003	01/02/20 12:47	mfm
Sodium (MWMT)	M6010D ICP	1	48.7		*	mg/L	0.2	1	12/23/19 20:51	kja
Strontium (MWMT)	M6010D ICP	1	1.08			mg/L	0.009	0.05	12/23/19 20:51	kja
Thallium (MWMT)	M6020B ICP-MS	5	0.0029	B		mg/L	0.0005	0.003	01/02/20 12:47	mfm
Thorium (MWMT)	M6020B ICP-MS	5	<0.005	U	*	mg/L	0.005	0.03	01/02/20 12:47	mfm
Tin (MWMT)	M6010D ICP	1	<0.04	U		mg/L	0.04	0.2	12/23/19 20:51	kja
Titanium (MWMT)	M6010D ICP	1	0.031		*	mg/L	0.005	0.03	12/23/19 20:51	kja
Uranium (MWMT)	M6020B ICP-MS	5	0.0322			mg/L	0.0005	0.003	01/02/20 12:47	mfm
Vanadium (MWMT)	M6020B ICP-MS	5	<0.003	U		mg/L	0.003	0.01	01/02/20 12:47	mfm
Zinc (MWMT)	M6020B ICP-MS	5	1.43		*	mg/L	0.02	0.05	01/02/20 12:47	mfm

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB32_0.5-3

ACZ Sample ID: ***L56331-01***
Date Sampled: *11/25/19 13:40*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
pH (MWMT)	M9045D/M9040C									
pH		1	4.2			units	0.1	0.1	12/18/19 0:00	cra/gkh
Temperature		1	19.3			C	0.1	0.1	12/18/19 0:00	cra/gkh
pH, Corrosivity	M9045D/M9040C									
pH		1	✔ 4.1	J 1,9		units	0.1	0.1	12/27/19 0:00	nnk
Temperature		1	22.9			C	0.1	0.1	12/27/19 0:00	nnk

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Meteoric Water Mobility Extraction	ASTM E2242-13									
Dry Weight		1	5000			g			12/17/19 0:00	gkh
Extraction pH		1	4.89			units			12/17/19 0:00	gkh
Extraction Temperature		1	23.0			C	0.1	0.1	12/17/19 0:00	gkh
Extraction Time		1	28.75			hrs			12/17/19 0:00	gkh
Leachate Volume		1	5017			mL			12/17/19 0:00	gkh
Particle Size over 5 cm		1	0			%			12/17/19 0:00	gkh
Post Filter pH		1	4.2			units			12/17/19 0:00	gkh
Pre Filter pH		1	4.16			units			12/17/19 0:00	gkh
Retained Moisture		1	11.3			%			12/17/19 0:00	gkh
Temperature		1	19.3			C	0.1	0.1	12/17/19 0:00	gkh
Time In		1							12/17/19 0:00	gkh
Time Out		1							12/17/19 0:00	gkh

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB32_0.5-3

ACZ Sample ID: ***L56331-01***
Date Sampled: *11/25/19 13:40*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity (MWMT)	SM2320B - Titration									
Bicarbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Total Alkalinity		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Chloride (MWMT)	SM4500Cl-E	1	9.9 ✓		*	mg/L	0.5	2	01/02/20 16:37	ttg
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation	0.5	<0.003	UH	*	mg/L	0.003	0.01	01/01/20 15:18	wtc
Fluoride (MWMT)	SM4500F-C	30	16		*	mg/L	3	10	01/03/20 15:49	emk
Nitrate as N (MWMT)	Calculation: NO3NO2 minus NO2		0.87			mg/L	0.02	0.1	06/23/20 0:00	calc
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	0.87 ✓		*	mg/L	0.02	0.1	12/20/19 0:44	pjb
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.01	U	*	mg/L	0.01	0.05	12/20/19 0:44	pjb
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor	1	2.2 ✓		*	mg/L	0.1	0.5	01/07/20 22:22	pjb
Residue, Filterable (TDS) @180C (MWMT)	SM2540C	2	4630 ✓	J 1 H	*	mg/L	40	80	12/31/19 16:23	mlh
Sulfate (MWMT)	D516-07 - Turbidimetric	120	2920		*	mg/L	120	600	01/14/20 11:30	wtc

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB32_6-15

ACZ Sample ID: ***L56331-02***
Date Sampled: *11/25/19 14:06*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Cyanide, WAD (MWMT) Prep	SM4500-CN I		-						01/01/20 11:46	wtc
ICP MWMT Prep	M6010D ICP								12/20/19 11:33	kja
ICPMS MWMT Prep	M6020B ICP-MS								12/28/19 11:34	mfm
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor								01/07/20 11:41	mss2

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum (MWMT)	M6010D ICP	1	5.67 ✓		*	mg/L	0.05	0.3	12/23/19 20:55	kja
Antimony (MWMT)	M6020B ICP-MS	2	<0.0008	U		mg/L	0.0008	0.004	01/02/20 12:49	mfm
Arsenic (MWMT)	M6020B ICP-MS	2	0.0016 ✓	B	*	mg/L	0.0004	0.002	01/02/20 12:49	mfm
Barium (MWMT)	M6010D ICP	1	0.017	B		mg/L	0.007	0.04	12/23/19 20:55	kja
Beryllium (MWMT)	M6020B ICP-MS	2	0.0018			mg/L	0.0002	0.0005	01/02/20 12:49	mfm
Boron (MWMT)	M6010D ICP	2	0.19 UJ 2	B	*	mg/L	0.04	0.2	12/26/19 12:29	jlw
Cadmium (MWMT)	M6020B ICP-MS	2	0.0052			mg/L	0.0001	0.0005	01/02/20 12:49	mfm
Calcium (MWMT)	M6010D ICP	2	524 ✓		*	mg/L	0.2	1	12/26/19 12:29	jlw
Chromium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 12:49	mfm
Cobalt (MWMT)	M6020B ICP-MS	2	0.440		*	mg/L	0.0001	0.0005	01/02/20 12:49	mfm
Copper (MWMT)	M6020B ICP-MS	200	55.2		*	mg/L	0.2	0.4	01/03/20 19:22	bsu
Iron (MWMT)	M6010D ICP	1	<0.03	U		mg/L	0.03	0.08	12/23/19 20:55	kja
Lead (MWMT)	M6020B ICP-MS	2	0.0013 ✓			mg/L	0.0002	0.001	01/02/20 12:49	mfm
Lithium (MWMT)	M6010D ICP	1	0.082		*	mg/L	0.008	0.04	12/23/19 20:55	kja
Magnesium (MWMT)	M6010D ICP	1	139			mg/L	0.2	1	12/23/19 20:55	kja
Manganese (MWMT)	M6020B ICP-MS	200	9.49		*	mg/L	0.08	0.4	01/03/20 19:22	bsu
Mercury (MWMT)	M7470A CVAA	1	<0.0002	U	*	mg/L	0.0002	0.001	12/20/19 17:58	slm
Molybdenum (MWMT)	M6020B ICP-MS	2	0.0012			mg/L	0.0004	0.001	01/02/20 12:49	mfm
Nickel (MWMT)	M6020B ICP-MS	2	0.233		*	mg/L	0.0008	0.002	01/02/20 12:49	mfm
Phosphorus (MWMT)	M6010D ICP	1	<0.1	U		mg/L	0.1	0.5	12/23/19 20:55	kja
Potassium (MWMT)	M6010D ICP	1	44.7			mg/L	0.2	1	12/23/19 20:55	kja
Selenium (MWMT)	M6020B ICP-MS	2	0.0518			mg/L	0.0002	0.0005	01/02/20 12:49	mfm
Silver (MWMT)	M6020B ICP-MS	2	<0.0002	U		mg/L	0.0002	0.001	01/02/20 12:49	mfm
Sodium (MWMT)	M6010D ICP	1	81.8		*	mg/L	0.2	1	12/23/19 20:55	kja
Strontium (MWMT)	M6010D ICP	1	3.27			mg/L	0.009	0.05	12/23/19 20:55	kja
Thallium (MWMT)	M6020B ICP-MS	2	0.0007	B		mg/L	0.0002	0.001	01/02/20 12:49	mfm
Thorium (MWMT)	M6020B ICP-MS	2	<0.002	U	*	mg/L	0.002	0.01	01/02/20 12:49	mfm
Tin (MWMT)	M6010D ICP	1	<0.04	U		mg/L	0.04	0.2	12/23/19 20:55	kja
Titanium (MWMT)	M6010D ICP	1	0.021 ✓	B	*	mg/L	0.005	0.03	12/23/19 20:55	kja
Uranium (MWMT)	M6020B ICP-MS	2	0.0243			mg/L	0.0002	0.001	01/02/20 12:49	mfm
Vanadium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 12:49	mfm
Zinc (MWMT)	M6020B ICP-MS	2	0.451		*	mg/L	0.008	0.02	01/02/20 12:49	mfm

REPIN.02.06.05.01

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB32_6-15

ACZ Sample ID: ***L56331-02***
Date Sampled: *11/25/19 14:06*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
pH (MWMT)	M9045D/M9040C									
pH		1	5.3 ✓			units	0.1	0.1	12/18/19 0:00	cra/gkh
Temperature		1	19.9			C	0.1	0.1	12/18/19 0:00	cra/gkh
pH, Corrosivity	M9045D/M9040C									
pH		1	5.4	J 1,9		units	0.1	0.1	12/27/19 0:00	nnk
Temperature		1	23.5			C	0.1	0.1	12/27/19 0:00	nnk

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Meteoric Water Mobility Extraction	ASTM E2242-13									
Dry Weight		1	5000			g			12/17/19 0:00	gkh
Extraction pH		1	4.89			units			12/17/19 0:00	gkh
Extraction Temperature		1	23.0			C	0.1	0.1	12/17/19 0:00	gkh
Extraction Time		1	29.25			hrs			12/17/19 0:00	gkh
Leachate Volume		1	5000.7			mL			12/17/19 0:00	gkh
Particle Size over 5 cm		1	0			%			12/17/19 0:00	gkh
Post Filter pH		1	5.48			units			12/17/19 0:00	gkh
Pre Filter pH		1	5.33			units			12/17/19 0:00	gkh
Retained Moisture		1	20.37			%			12/17/19 0:00	gkh
Temperature		1	19.9			C	0.1	0.1	12/17/19 0:00	gkh
Time In		1							12/17/19 0:00	gkh
Time Out		1							12/17/19 0:00	gkh

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB32_6-15

ACZ Sample ID: ***L56331-02***
Date Sampled: *11/25/19 14:06*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity (MWMT)	SM2320B - Titration									
Bicarbonate as CaCO3		1	3.7 ✓	B	*	mg/L	2	20	12/27/19 0:00	enb
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Total Alkalinity		1	3.7	B	*	mg/L	2	20	12/27/19 0:00	enb
Chloride (MWMT)	SM4500Cl-E	1	17.1 ✓		*	mg/L	0.5	2	01/02/20 16:37	ttg
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation	0.5	<0.003	UH	*	mg/L	0.003	0.01	01/01/20 15:20	wtc
Fluoride (MWMT)	SM4500F-C	6	11.7 ✓		*	mg/L	0.7	2	01/03/20 16:10	emk
Nitrate as N (MWMT)	Calculation: NO3NO2 minus NO2		0.04	B		mg/L	0.02	0.1	06/23/20 0:00	calc
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	0.04	B	*	mg/L	0.02	0.1	12/20/19 0:46	pjb
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.01	U	*	mg/L	0.01	0.05	12/20/19 0:46	pjb
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor	1	0.5		*	mg/L	0.1	0.5	01/07/20 22:24	pjb
Residue, Filterable (TDS) @180C (MWMT)	SM2540C	1	3290 ✓ J 1	H	*	mg/L	20	40	12/31/19 16:26	mlh
Sulfate (MWMT)	D516-07 - Turbidimetric	120	2160		*	mg/L	120	600	01/14/20 11:32	wtc

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB34_0.5-3

ACZ Sample ID: ***L56331-03***
Date Sampled: *11/25/19 15:05*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Cyanide, WAD (MWMT) Prep	SM4500-CN I		-						01/01/20 12:04	wtc
ICP MWMT Prep	M6010D ICP								12/20/19 11:58	kja
ICPMS MWMT Prep	M6020B ICP-MS								12/28/19 11:46	mfm
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor								01/07/20 12:15	mss2

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum (MWMT)	M6010D ICP	1	4.32		*	mg/L	0.05	0.3	12/23/19 20:59	kja
Antimony (MWMT)	M6020B ICP-MS	2	0.0009 ✓	B		mg/L	0.0008	0.004	01/02/20 12:50	mfm
Arsenic (MWMT)	M6020B ICP-MS	2	0.0018	B	*	mg/L	0.0004	0.002	01/02/20 12:50	mfm
Barium (MWMT)	M6010D ICP	1	0.018 ✓	B		mg/L	0.007	0.04	12/23/19 20:59	kja
Beryllium (MWMT)	M6020B ICP-MS	2	0.0008			mg/L	0.0002	0.0005	01/02/20 12:50	mfm
Boron (MWMT)	M6010D ICP	2	0.14 UJ 2	B	*	mg/L	0.04	0.2	12/26/19 12:32	jlw
Cadmium (MWMT)	M6020B ICP-MS	2	0.0016			mg/L	0.0001	0.0005	01/02/20 12:50	mfm
Calcium (MWMT)	M6010D ICP	2	533		*	mg/L	0.2	1	12/26/19 12:32	jlw
Chromium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 12:50	mfm
Cobalt (MWMT)	M6020B ICP-MS	2	0.0762		*	mg/L	0.0001	0.0005	01/02/20 12:50	mfm
Copper (MWMT)	M6020B ICP-MS	200	65.0 ✓		*	mg/L	0.2	0.4	01/03/20 19:24	bsu
Iron (MWMT)	M6010D ICP	1	0.06	B		mg/L	0.03	0.08	12/23/19 20:59	kja
Lead (MWMT)	M6020B ICP-MS	2	0.0004	B		mg/L	0.0002	0.001	01/02/20 12:50	mfm
Lithium (MWMT)	M6010D ICP	1	0.038	B	*	mg/L	0.008	0.04	12/23/19 20:59	kja
Magnesium (MWMT)	M6010D ICP	1	78.3			mg/L	0.2	1	12/23/19 20:59	kja
Manganese (MWMT)	M6020B ICP-MS	2	1.05 ✓		*	mg/L	0.0008	0.004	01/02/20 12:50	mfm
Mercury (MWMT)	M7470A CVAA	1	<0.0002	U	*	mg/L	0.0002	0.001	12/20/19 17:59	slm
Molybdenum (MWMT)	M6020B ICP-MS	2	<0.0004	U		mg/L	0.0004	0.001	01/02/20 12:50	mfm
Nickel (MWMT)	M6020B ICP-MS	2	0.084		*	mg/L	0.0008	0.002	01/02/20 12:50	mfm
Phosphorus (MWMT)	M6010D ICP	1	<0.1	U		mg/L	0.1	0.5	12/23/19 20:59	kja
Potassium (MWMT)	M6010D ICP	1	21.1			mg/L	0.2	1	12/23/19 20:59	kja
Selenium (MWMT)	M6020B ICP-MS	2	0.0026			mg/L	0.0002	0.0005	01/02/20 12:50	mfm
Silver (MWMT)	M6020B ICP-MS	2	<0.0002	U		mg/L	0.0002	0.001	01/02/20 12:50	mfm
Sodium (MWMT)	M6010D ICP	2	13.7 ✓		*	mg/L	0.4	2	12/26/19 12:32	jlw
Strontium (MWMT)	M6010D ICP	1	1.85			mg/L	0.009	0.05	12/23/19 20:59	kja
Thallium (MWMT)	M6020B ICP-MS	2	0.0005 ✓	B		mg/L	0.0002	0.001	01/02/20 12:50	mfm
Thorium (MWMT)	M6020B ICP-MS	2	<0.002	U	*	mg/L	0.002	0.01	01/02/20 12:50	mfm
Tin (MWMT)	M6010D ICP	1	<0.04	U		mg/L	0.04	0.2	12/23/19 20:59	kja
Titanium (MWMT)	M6010D ICP	1	0.021 ✓	B	*	mg/L	0.005	0.03	12/23/19 20:59	kja
Uranium (MWMT)	M6020B ICP-MS	2	0.004			mg/L	0.0002	0.001	01/02/20 12:50	mfm
Vanadium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 12:50	mfm
Zinc (MWMT)	M6020B ICP-MS	2	0.240		*	mg/L	0.008	0.02	01/02/20 12:50	mfm

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB34_0.5-3

ACZ Sample ID: ***L56331-03***
Date Sampled: *11/25/19 15:05*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
pH (MWMT)	M9045D/M9040C									
pH		1	4.9			units	0.1	0.1	12/18/19 0:00	cra/gkh
Temperature		1	19.9			C	0.1	0.1	12/18/19 0:00	cra/gkh
pH, Corrosivity	M9045D/M9040C									
pH		1	✔ 4.7	J 1,9		units	0.1	0.1	12/27/19 0:00	nnk
Temperature		1	23.2			C	0.1	0.1	12/27/19 0:00	nnk

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Meteoric Water Mobility Extraction	ASTM E2242-13									
Dry Weight		1	5000			g			12/17/19 0:00	gkh
Extraction pH		1	4.89			units			12/17/19 0:00	gkh
Extraction Temperature		1	23.0			C	0.1	0.1	12/17/19 0:00	gkh
Extraction Time		1	28.81667			hrs			12/17/19 0:00	gkh
Leachate Volume		1	5003			mL			12/17/19 0:00	gkh
Particle Size over 5 cm		1	0			%			12/17/19 0:00	gkh
Post Filter pH		1	4.9			units			12/17/19 0:00	gkh
Pre Filter pH		1	4.94			units			12/17/19 0:00	gkh
Retained Moisture		1	10.64			%			12/17/19 0:00	gkh
Temperature		1	19.9			C	0.1	0.1	12/17/19 0:00	gkh
Time In		1							12/17/19 0:00	gkh
Time Out		1							12/17/19 0:00	gkh

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB34_0.5-3

ACZ Sample ID: ***L56331-03***
Date Sampled: *11/25/19 15:05*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity (MWMT)	SM2320B - Titration									
Bicarbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Total Alkalinity		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Chloride (MWMT)	SM4500Cl-E	1	1.8	B	*	mg/L	0.5	2	01/02/20 16:37	ttg
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation	0.5	<0.003 ✓	UH	*	mg/L	0.003	0.01	01/01/20 15:21	wtc
Fluoride (MWMT)	SM4500F-C	5	4.4		*	mg/L	0.6	2	01/03/20 16:17	emk
Nitrate as N (MWMT)	Calculation: NO3NO2 minus NO2		0.26 ✓			mg/L	0.02	0.1	06/23/20 0:00	calc
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	0.26		*	mg/L	0.02	0.1	12/20/19 0:47	pjb
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.01	U	*	mg/L	0.01	0.05	12/20/19 0:47	pjb
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor	1	1.8 ✓		*	mg/L	0.1	0.5	01/07/20 22:26	pjb
Residue, Filterable (TDS) @180C (MWMT)	SM2540C	1	2780 J 1	H	*	mg/L	20	40	12/31/19 16:29	mlh
Sulfate (MWMT)	D516-07 - Turbidimetric	120	1890 ✓		*	mg/L	120	600	01/14/20 11:30	wtc

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB34_6-15

ACZ Sample ID: ***L56331-04***
Date Sampled: *11/25/19 15:28*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Cyanide, WAD (MWMT) Prep	SM4500-CN I		-						01/01/20 12:13	wtc
ICP MWMT Prep	M6010D ICP								12/20/19 12:23	kja
ICPMS MWMT Prep	M6020B ICP-MS								12/28/19 11:58	mfm
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor								01/07/20 12:33	mss2

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum (MWMT)	M6010D ICP	1	16.4		*	mg/L	0.05	0.3	12/23/19 21:03	kja
Antimony (MWMT)	M6020B ICP-MS	2	<0.0008	U		mg/L	0.0008	0.004	01/02/20 12:52	mfm
Arsenic (MWMT)	M6020B ICP-MS	2	0.0025		*	mg/L	0.0004	0.002	01/02/20 12:52	mfm
Barium (MWMT)	M6010D ICP	1	0.019	B		mg/L	0.007	0.04	12/23/19 21:03	kja
Beryllium (MWMT)	M6020B ICP-MS	2	0.0049 ✓			mg/L	0.0002	0.0005	01/02/20 12:52	mfm
Boron (MWMT)	M6010D ICP	2	✓ 0.23 UJ 2		*	mg/L	0.04	0.2	12/26/19 12:36	jlw
Cadmium (MWMT)	M6020B ICP-MS	2	0.0059			mg/L	0.0001	0.0005	01/02/20 12:52	mfm
Calcium (MWMT)	M6010D ICP	2	518		*	mg/L	0.2	1	12/26/19 12:36	jlw
Chromium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 12:52	mfm
Cobalt (MWMT)	M6020B ICP-MS	2	0.690		*	mg/L	0.0001	0.0005	01/02/20 12:52	mfm
Copper (MWMT)	M6020B ICP-MS	200	81.8		*	mg/L	0.2	0.4	01/03/20 19:26	bsu
Iron (MWMT)	M6010D ICP	1	<0.03	U		mg/L	0.03	0.08	12/23/19 21:03	kja
Lead (MWMT)	M6020B ICP-MS	2	0.0004	B		mg/L	0.0002	0.001	01/02/20 12:52	mfm
Lithium (MWMT)	M6010D ICP	1	0.166 ✓		*	mg/L	0.008	0.04	12/23/19 21:03	kja
Magnesium (MWMT)	M6010D ICP	1	185			mg/L	0.2	1	12/23/19 21:03	kja
Manganese (MWMT)	M6020B ICP-MS	200	15.9 ✓		*	mg/L	0.08	0.4	01/03/20 19:26	bsu
Mercury (MWMT)	M7470A CVAA	1	<0.0002	U	*	mg/L	0.0002	0.001	12/20/19 18:00	slm
Molybdenum (MWMT)	M6020B ICP-MS	2	0.0011			mg/L	0.0004	0.001	01/02/20 12:52	mfm
Nickel (MWMT)	M6020B ICP-MS	2	0.395		*	mg/L	0.0008	0.002	01/02/20 12:52	mfm
Phosphorus (MWMT)	M6010D ICP	1	<0.1	U		mg/L	0.1	0.5	12/23/19 21:03	kja
Potassium (MWMT)	M6010D ICP	1	63.4			mg/L	0.2	1	12/23/19 21:03	kja
Selenium (MWMT)	M6020B ICP-MS	2	0.104			mg/L	0.0002	0.0005	01/02/20 12:52	mfm
Silver (MWMT)	M6020B ICP-MS	2	<0.0002	U		mg/L	0.0002	0.001	01/02/20 12:52	mfm
Sodium (MWMT)	M6010D ICP	1	116		*	mg/L	0.2	1	12/23/19 21:03	kja
Strontium (MWMT)	M6010D ICP	1	4.01 ✓			mg/L	0.009	0.05	12/23/19 21:03	kja
Thallium (MWMT)	M6020B ICP-MS	2	0.0003	B		mg/L	0.0002	0.001	01/02/20 12:52	mfm
Thorium (MWMT)	M6020B ICP-MS	2	<0.002	U	*	mg/L	0.002	0.01	01/02/20 12:52	mfm
Tin (MWMT)	M6010D ICP	1	<0.04	U		mg/L	0.04	0.2	12/23/19 21:03	kja
Titanium (MWMT)	M6010D ICP	1	0.021	B	*	mg/L	0.005	0.03	12/23/19 21:03	kja
Uranium (MWMT)	M6020B ICP-MS	2	0.0382			mg/L	0.0002	0.001	01/02/20 12:52	mfm
Vanadium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 12:52	mfm
Zinc (MWMT)	M6020B ICP-MS	2	0.540 ✓		*	mg/L	0.008	0.02	01/02/20 12:52	mfm

REPIN.02.06.05.01

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB34_6-15

ACZ Sample ID: ***L56331-04***
Date Sampled: *11/25/19 15:28*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
pH (MWMT)	M9045D/M9040C									
pH		1	5.3 ✓			units	0.1	0.1	12/18/19 0:00	cra/gkh
Temperature		1	19.8			C	0.1	0.1	12/18/19 0:00	cra/gkh
pH, Corrosivity	M9045D/M9040C									
pH		1	5.1	J 1,9		units	0.1	0.1	12/27/19 0:00	nnk
Temperature		1	23.0			C	0.1	0.1	12/27/19 0:00	nnk

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Meteoric Water Mobility Extraction	ASTM E2242-13									
Dry Weight		1	5000			g			12/17/19 0:00	gkh
Extraction pH		1	4.89			units			12/17/19 0:00	gkh
Extraction Temperature		1	23.0			C	0.1	0.1	12/17/19 0:00	gkh
Extraction Time		1	28.83333			hrs			12/17/19 0:00	gkh
Leachate Volume		1	5003.4			mL			12/17/19 0:00	gkh
Particle Size over 5 cm		1	0			%			12/17/19 0:00	gkh
Post Filter pH		1	5.38			units			12/17/19 0:00	gkh
Pre Filter pH		1	5.26			units			12/17/19 0:00	gkh
Retained Moisture		1	19.98			%			12/17/19 0:00	gkh
Temperature		1	19.8			C	0.1	0.1	12/17/19 0:00	gkh
Time In		1							12/17/19 0:00	gkh
Time Out		1							12/17/19 0:00	gkh

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB34_6-15

ACZ Sample ID: ***L56331-04***
Date Sampled: *11/25/19 15:28*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity (MWMT)	SM2320B - Titration									
Bicarbonate as CaCO3		1	2.4 ✓	B	*	mg/L	2	20	12/27/19 0:00	enb
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Total Alkalinity		1	2.4	B	*	mg/L	2	20	12/27/19 0:00	enb
Chloride (MWMT)	SM4500Cl-E	1	23.6		*	mg/L	0.5	2	01/02/20 16:37	ttg
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation	0.5	<0.003 ✓	UH	*	mg/L	0.003	0.01	01/01/20 15:22	wtc
Fluoride (MWMT)	SM4500F-C	20	25 ✓		*	mg/L	2	7	01/03/20 16:23	emk
Nitrate as N (MWMT)	Calculation: NO3NO2 minus NO2		0.24			mg/L	0.02	0.1	06/23/20 0:00	calc
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	0.24		*	mg/L	0.02	0.1	12/20/19 0:49	pjb
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.01	U	*	mg/L	0.01	0.05	12/20/19 0:49	pjb
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor	1	0.6		*	mg/L	0.1	0.5	01/07/20 22:27	pjb
Residue, Filterable (TDS) @180C (MWMT)	SM2540C	1	3810 ✓ J 1	H	*	mg/L	20	40	12/31/19 16:33	mlh
Sulfate (MWMT)	D516-07 - Turbidimetric	120	2470		*	mg/L	120	600	01/14/20 11:32	wtc

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33_0.5-3

ACZ Sample ID: ***L56331-05***
Date Sampled: *12/03/19 12:40*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Cyanide, WAD (MWMT) Prep	SM4500-CN I		-						01/01/20 12:23	wtc
ICP MWMT Prep	M6010D ICP								12/20/19 12:48	kja
ICPMS MWMT Prep	M6020B ICP-MS								12/28/19 12:10	mfm
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor								01/07/20 12:50	mss2

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum (MWMT)	M6010D ICP	1	27.5		*	mg/L	0.05	0.3	12/23/19 21:07	kja
Antimony (MWMT)	M6020B ICP-MS	2	<0.0008	U		mg/L	0.0008	0.004	01/02/20 12:58	mfm
Arsenic (MWMT)	M6020B ICP-MS	2	0.0048		*	mg/L	0.0004	0.002	01/02/20 12:58	mfm
Barium (MWMT)	M6010D ICP	1	0.015	B		mg/L	0.007	0.04	12/23/19 21:07	kja
Beryllium (MWMT)	M6020B ICP-MS	2	0.007			mg/L	0.0002	0.0005	01/02/20 12:58	mfm
Boron (MWMT)	M6010D ICP	1	0.12	UJ 2	*	mg/L	0.02	0.1	12/26/19 12:40	jlw
Cadmium (MWMT)	M6020B ICP-MS	2	0.0036 ✓			mg/L	0.0001	0.0005	01/02/20 12:58	mfm
Calcium (MWMT)	M6010D ICP	1	497 ✓		*	mg/L	0.1	0.5	12/23/19 21:07	kja
Chromium (MWMT)	M6020B ICP-MS	2	0.001	B		mg/L	0.001	0.004	01/02/20 12:58	mfm
Cobalt (MWMT)	M6020B ICP-MS	2	0.511		*	mg/L	0.0001	0.0005	01/02/20 12:58	mfm
Copper (MWMT)	M6020B ICP-MS	500	170		*	mg/L	0.4	1	01/03/20 19:28	bsu
Iron (MWMT)	M6010D ICP	1	0.17 ✓			mg/L	0.03	0.08	12/23/19 21:07	kja
Lead (MWMT)	M6020B ICP-MS	2	0.0007	B		mg/L	0.0002	0.001	01/02/20 12:58	mfm
Lithium (MWMT)	M6010D ICP	1	0.219		*	mg/L	0.008	0.04	12/23/19 21:07	kja
Magnesium (MWMT)	M6010D ICP	1	97.3			mg/L	0.2	1	12/23/19 21:07	kja
Manganese (MWMT)	M6020B ICP-MS	500	5.3 ✓		*	mg/L	0.2	1	01/03/20 19:28	bsu
Mercury (MWMT)	M7470A CVAA	1	<0.0002 ✓	U	*	mg/L	0.0002	0.001	12/20/19 18:01	slm
Molybdenum (MWMT)	M6020B ICP-MS	2	<0.0004	U		mg/L	0.0004	0.001	01/02/20 12:58	mfm
Nickel (MWMT)	M6020B ICP-MS	2	0.314 ✓		*	mg/L	0.0008	0.002	01/02/20 12:58	mfm
Phosphorus (MWMT)	M6010D ICP	1	<0.1	U		mg/L	0.1	0.5	12/23/19 21:07	kja
Potassium (MWMT)	M6010D ICP	1	6.9			mg/L	0.2	1	12/23/19 21:07	kja
Selenium (MWMT)	M6020B ICP-MS	2	0.0192			mg/L	0.0002	0.0005	01/02/20 12:58	mfm
Silver (MWMT)	M6020B ICP-MS	2	<0.0002	U		mg/L	0.0002	0.001	01/02/20 12:58	mfm
Sodium (MWMT)	M6010D ICP	1	24.2 ✓		*	mg/L	0.2	1	12/26/19 12:40	jlw
Strontium (MWMT)	M6010D ICP	1	0.965			mg/L	0.009	0.05	12/23/19 21:07	kja
Thallium (MWMT)	M6020B ICP-MS	2	0.0003	B		mg/L	0.0002	0.001	01/02/20 12:58	mfm
Thorium (MWMT)	M6020B ICP-MS	2	<0.002	U	*	mg/L	0.002	0.01	01/02/20 12:58	mfm
Tin (MWMT)	M6010D ICP	1	<0.04	U		mg/L	0.04	0.2	12/23/19 21:07	kja
Titanium (MWMT)	M6010D ICP	1	0.024	B	*	mg/L	0.005	0.03	12/23/19 21:07	kja
Uranium (MWMT)	M6020B ICP-MS	2	0.0505			mg/L	0.0002	0.001	01/02/20 12:58	mfm
Vanadium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 12:58	mfm
Zinc (MWMT)	M6020B ICP-MS	2	0.503		*	mg/L	0.008	0.02	01/02/20 12:58	mfm

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33_0.5-3

ACZ Sample ID: ***L56331-05***
Date Sampled: *12/03/19 12:40*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
pH (MWMT)	M9045D/M9040C									
pH		1	4.3			units	0.1	0.1	12/18/19 0:00	cra/gkh
Temperature		1	19.8			C	0.1	0.1	12/18/19 0:00	cra/gkh
pH, Corrosivity	M9045D/M9040C									
pH		1	4.1	J 1,9		units	0.1	0.1	12/27/19 0:00	nnk
Temperature		1	23.2			C	0.1	0.1	12/27/19 0:00	nnk

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Meteoric Water Mobility Extraction	ASTM E2242-13									
Dry Weight		1	5000			g			12/17/19 0:00	gkh
Extraction pH		1	4.89			units			12/17/19 0:00	gkh
Extraction Temperature		1	23.0			C	0.1	0.1	12/17/19 0:00	gkh
Extraction Time		1	30.58333			hrs			12/17/19 0:00	gkh
Leachate Volume		1	5022			mL			12/17/19 0:00	gkh
Particle Size over 5 cm		1	0			%			12/17/19 0:00	gkh
Post Filter pH		1	4.19			units			12/17/19 0:00	gkh
Pre Filter pH		1	4.3			units			12/17/19 0:00	gkh
Retained Moisture		1	16.27			%			12/17/19 0:00	gkh
Temperature		1	19.8			C	0.1	0.1	12/17/19 0:00	gkh
Time In		1							12/17/19 0:00	gkh
Time Out		1							12/17/19 0:00	gkh

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33_0.5-3

ACZ Sample ID: ***L56331-05***
Date Sampled: *12/03/19 12:40*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity (MWMT)	SM2320B - Titration									
Bicarbonate as CaCO3		1	<2 ✓	U	*	mg/L	2	20	12/27/19 0:00	enb
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Total Alkalinity		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Chloride (MWMT)	SM4500Cl-E	1	3.7 ✓		*	mg/L	0.5	2	01/02/20 16:37	ttg
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation	0.5	<0.003	U	*	mg/L	0.003	0.01	01/01/20 15:23	wtc
Fluoride (MWMT)	SM4500F-C	30	18		*	mg/L	3	10	01/03/20 16:31	emk
Nitrate as N (MWMT)	Calculation: NO3NO2 minus NO2		0.41			mg/L	0.02	0.1	06/23/20 0:00	calc
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	0.41		*	mg/L	0.02	0.1	12/20/19 0:50	pjb
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.01	U	*	mg/L	0.01	0.05	12/20/19 0:50	pjb
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor	1	1.3 ✓		*	mg/L	0.1	0.5	01/07/20 22:28	pjb
Residue, Filterable (TDS) @180C (MWMT)	SM2540C	1	3390 ✓ J 1	H	*	mg/L	20	40	12/31/19 16:39	mlh
Sulfate (MWMT)	D516-07 - Turbidimetric	120	2210		*	mg/L	120	600	01/14/20 11:32	wtc

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33_6-15

ACZ Sample ID: ***L56331-06***
Date Sampled: *12/03/19 13:05*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Cyanide, WAD (MWMT) Prep	SM4500-CN I		-						01/01/20 12:32	wtc
ICP MWMT Prep	M6010D ICP								12/20/19 14:03	kja
ICPMS MWMT Prep	M6020B ICP-MS								12/28/19 12:46	mfm
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor								01/07/20 13:07	mss2

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum (MWMT)	M6010D ICP	1	<0.05	U	*	mg/L	0.05	0.3	12/23/19 21:18	kja
Antimony (MWMT)	M6020B ICP-MS	1	0.001	B		mg/L	0.0004	0.002	01/02/20 13:03	mfm
Arsenic (MWMT)	M6020B ICP-MS	1	0.0009	B	*	mg/L	0.0002	0.001	01/02/20 13:03	mfm
Barium (MWMT)	M6010D ICP	1	0.017	B		mg/L	0.007	0.04	12/23/19 21:18	kja
Beryllium (MWMT)	M6020B ICP-MS	1	<0.00008	U		mg/L	0.00008	0.0003	01/02/20 13:03	mfm
Boron (MWMT)	M6010D ICP	1	0.16 ✓	UJ 2	*	mg/L	0.02	0.1	12/26/19 12:52	jlw
Cadmium (MWMT)	M6020B ICP-MS	1	0.00008	B		mg/L	0.00005	0.0003	01/02/20 13:03	mfm
Calcium (MWMT)	M6010D ICP	1	216		*	mg/L	0.1	0.5	12/23/19 21:18	kja
Chromium (MWMT)	M6020B ICP-MS	1	<0.0005	U		mg/L	0.0005	0.002	01/02/20 13:03	mfm
Cobalt (MWMT)	M6020B ICP-MS	1	0.00383 ✓		*	mg/L	0.00005	0.0003	01/02/20 13:03	mfm
Copper (MWMT)	M6020B ICP-MS	5	0.023 ✓		*	mg/L	0.004	0.01	01/03/20 19:37	bsu
Iron (MWMT)	M6010D ICP	1	<0.03	U		mg/L	0.03	0.08	12/23/19 21:18	kja
Lead (MWMT)	M6020B ICP-MS	1	<0.0001	U		mg/L	0.0001	0.0005	01/02/20 13:03	mfm
Lithium (MWMT)	M6010D ICP	1	0.031	B	*	mg/L	0.008	0.04	12/23/19 21:18	kja
Magnesium (MWMT)	M6010D ICP	1	18.5			mg/L	0.2	1	12/23/19 21:18	kja
Manganese (MWMT)	M6020B ICP-MS	1	0.620		*	mg/L	0.0004	0.002	01/02/20 13:03	mfm
Mercury (MWMT)	M7470A CVAA	1	<0.0002 ✓	U	*	mg/L	0.0002	0.001	12/20/19 18:06	slm
Molybdenum (MWMT)	M6020B ICP-MS	1	0.0556			mg/L	0.0002	0.0005	01/02/20 13:03	mfm
Nickel (MWMT)	M6020B ICP-MS	1	0.003		*	mg/L	0.0004	0.001	01/02/20 13:03	mfm
Phosphorus (MWMT)	M6010D ICP	1	<0.1	U		mg/L	0.1	0.5	12/23/19 21:18	kja
Potassium (MWMT)	M6010D ICP	1	31.6 ✓			mg/L	0.2	1	12/23/19 21:18	kja
Selenium (MWMT)	M6020B ICP-MS	1	0.026			mg/L	0.0001	0.0003	01/02/20 13:03	mfm
Silver (MWMT)	M6020B ICP-MS	1	<0.0001	U		mg/L	0.0001	0.0005	01/02/20 13:03	mfm
Sodium (MWMT)	M6010D ICP	1	62.0		*	mg/L	0.2	1	12/23/19 21:18	kja
Strontium (MWMT)	M6010D ICP	1	1.71			mg/L	0.009	0.05	12/23/19 21:18	kja
Thallium (MWMT)	M6020B ICP-MS	1	<0.0001	U		mg/L	0.0001	0.0005	01/02/20 13:03	mfm
Thorium (MWMT)	M6020B ICP-MS	1	<0.001	U	*	mg/L	0.001	0.005	01/02/20 13:03	mfm
Tin (MWMT)	M6010D ICP	1	<0.04	U		mg/L	0.04	0.2	12/23/19 21:18	kja
Titanium (MWMT)	M6010D ICP	1	0.018 ✓	B	*	mg/L	0.005	0.03	12/23/19 21:18	kja
Uranium (MWMT)	M6020B ICP-MS	1	0.103 ✓			mg/L	0.0001	0.0005	01/02/20 13:03	mfm
Vanadium (MWMT)	M6020B ICP-MS	1	<0.0005	U		mg/L	0.0005	0.002	01/02/20 13:03	mfm
Zinc (MWMT)	M6020B ICP-MS	1	<0.004	U	*	mg/L	0.004	0.01	01/02/20 13:03	mfm

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33_6-15

ACZ Sample ID: ***L56331-06***
Date Sampled: *12/03/19 13:05*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
pH (MWMT)	M9045D/M9040C									
pH		1	7.1 ✓			units	0.1	0.1	12/18/19 0:00	cra/gkh
Temperature		1	19.2			C	0.1	0.1	12/18/19 0:00	cra/gkh
pH, Corrosivity	M9045D/M9040C									
pH		1	7.0	J 1,9		units	0.1	0.1	12/27/19 0:00	nnk
Temperature		1	23.2			C	0.1	0.1	12/27/19 0:00	nnk

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Meteoric Water Mobility Extraction	ASTM E2242-13									
Dry Weight		1	5000			g			12/17/19 0:00	gkh
Extraction pH		1	4.89			units			12/17/19 0:00	gkh
Extraction Temperature		1	23.0			C	0.1	0.1	12/17/19 0:00	gkh
Extraction Time		1	31.25			hrs			12/17/19 0:00	gkh
Leachate Volume		1	5009.7			mL			12/17/19 0:00	gkh
Particle Size over 5 cm		1	0			%			12/17/19 0:00	gkh
Post Filter pH		1	7.34			units			12/17/19 0:00	gkh
Pre Filter pH		1	7.07			units			12/17/19 0:00	gkh
Retained Moisture		1	21.6			%			12/17/19 0:00	gkh
Temperature		1	19.2			C	0.1	0.1	12/17/19 0:00	gkh
Time In		1							12/17/19 0:00	gkh
Time Out		1							12/17/19 0:00	gkh

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33_6-15

ACZ Sample ID: ***L56331-06***
Date Sampled: *12/03/19 13:05*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity (MWMT)	SM2320B - Titration									
Bicarbonate as CaCO3		1	60.7		*	mg/L	2	20	12/27/19 0:00	enb
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Total Alkalinity		1	60.7		*	mg/L	2	20	12/27/19 0:00	enb
Chloride (MWMT)	SM4500Cl-E	1	12.6		*	mg/L	0.5	2	01/02/20 16:37	ttg
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation	0.5	<0.003 ✓	U	*	mg/L	0.003	0.01	01/01/20 15:26	wtc
Fluoride (MWMT)	SM4500F-C	1	3.3 ✓		*	mg/L	0.1	0.4	01/03/20 16:38	emk
Nitrate as N (MWMT)	Calculation: NO3NO2 minus NO2		0.05	B		mg/L	0.02	0.1	06/23/20 0:00	calc
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	0.05 ✓	B	*	mg/L	0.02	0.1	12/20/19 0:51	pjb
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.01	U	*	mg/L	0.01	0.05	12/20/19 0:51	pjb
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor	1	<0.1	U	*	mg/L	0.1	0.5	01/07/20 22:32	pjb
Residue, Filterable (TDS) @180C (MWMT)	SM2540C	1	1110 J 1	H	*	mg/L	20	40	12/31/19 16:43	mlh
Sulfate (MWMT)	D516-07 - Turbidimetric	20	688 ✓		*	mg/L	20	100	01/14/20 11:15	wtc

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33-FD_0.5-3

ACZ Sample ID: ***L56331-07***
Date Sampled: *12/03/19 12:48*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Cyanide, WAD (MWMT) Prep	SM4500-CN I		-						01/01/20 12:41	wtc
ICP MWMT Prep	M6010D ICP								12/20/19 14:28	kja
ICPMS MWMT Prep	M6020B ICP-MS								12/28/19 12:58	mfm
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor								01/07/20 13:24	mss2

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum (MWMT)	M6010D ICP	1	22.5		*	mg/L	0.05	0.3	12/23/19 21:30	kja
Antimony (MWMT)	M6020B ICP-MS	2	<0.0008	U		mg/L	0.0008	0.004	01/02/20 13:06	mfm
Arsenic (MWMT)	M6020B ICP-MS	2	0.0043		*	mg/L	0.0004	0.002	01/02/20 13:06	mfm
Barium (MWMT)	M6010D ICP	1	0.017 ✓	B		mg/L	0.007	0.04	12/23/19 21:30	kja
Beryllium (MWMT)	M6020B ICP-MS	2	0.0052			mg/L	0.0002	0.0005	01/02/20 13:06	mfm
Boron (MWMT)	M6010D ICP	2	0.12 UJ 2	B	*	mg/L	0.04	0.2	12/26/19 13:07	jlw
Cadmium (MWMT)	M6020B ICP-MS	2	0.0033			mg/L	0.0001	0.0005	01/02/20 13:06	mfm
Calcium (MWMT)	M6010D ICP	2	520 ✓		*	mg/L	0.2	1	12/26/19 13:07	jlw
Chromium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 13:06	mfm
Cobalt (MWMT)	M6020B ICP-MS	2	0.493 ✓		*	mg/L	0.0001	0.0005	01/02/20 13:06	mfm
Copper (MWMT)	M6020B ICP-MS	500	156		*	mg/L	0.4	1	01/03/20 19:39	bsu
Iron (MWMT)	M6010D ICP	1	0.12			mg/L	0.03	0.08	12/23/19 21:30	kja
Lead (MWMT)	M6020B ICP-MS	2	0.0005	B		mg/L	0.0002	0.001	01/02/20 13:06	mfm
Lithium (MWMT)	M6010D ICP	1	0.303		*	mg/L	0.008	0.04	12/23/19 21:30	kja
Magnesium (MWMT)	M6010D ICP	1	101			mg/L	0.2	1	12/23/19 21:30	kja
Manganese (MWMT)	M6020B ICP-MS	500	5.1 ✓		*	mg/L	0.2	1	01/03/20 19:39	bsu
Mercury (MWMT)	M7470A CVAA	1	<0.0002 ✓	U	*	mg/L	0.0002	0.001	12/20/19 18:07	slm
Molybdenum (MWMT)	M6020B ICP-MS	2	<0.0004	U		mg/L	0.0004	0.001	01/02/20 13:06	mfm
Nickel (MWMT)	M6020B ICP-MS	2	0.300		*	mg/L	0.0008	0.002	01/02/20 13:06	mfm
Phosphorus (MWMT)	M6010D ICP	1	<0.1	U		mg/L	0.1	0.5	12/23/19 21:30	kja
Potassium (MWMT)	M6010D ICP	1	7.9			mg/L	0.2	1	12/23/19 21:30	kja
Selenium (MWMT)	M6020B ICP-MS	2	0.0174			mg/L	0.0002	0.0005	01/02/20 13:06	mfm
Silver (MWMT)	M6020B ICP-MS	2	<0.0002	U		mg/L	0.0002	0.001	01/02/20 13:06	mfm
Sodium (MWMT)	M6010D ICP	2	25.9 ✓		*	mg/L	0.4	2	12/26/19 13:07	jlw
Strontium (MWMT)	M6010D ICP	1	1.14			mg/L	0.009	0.05	12/23/19 21:30	kja
Thallium (MWMT)	M6020B ICP-MS	2	0.0003 ✓	B		mg/L	0.0002	0.001	01/02/20 13:06	mfm
Thorium (MWMT)	M6020B ICP-MS	2	<0.002	U	*	mg/L	0.002	0.01	01/02/20 13:06	mfm
Tin (MWMT)	M6010D ICP	1	<0.04	U		mg/L	0.04	0.2	12/23/19 21:30	kja
Titanium (MWMT)	M6010D ICP	1	0.022	B	*	mg/L	0.005	0.03	12/23/19 21:30	kja
Uranium (MWMT)	M6020B ICP-MS	2	0.0361			mg/L	0.0002	0.001	01/02/20 13:06	mfm
Vanadium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 13:06	mfm
Zinc (MWMT)	M6020B ICP-MS	2	0.487		*	mg/L	0.008	0.02	01/02/20 13:06	mfm

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33-FD_0.5-3

ACZ Sample ID: ***L56331-07***
Date Sampled: *12/03/19 12:48*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
pH (MWMT)	M9045D/M9040C									
pH		1	4.3			units	0.1	0.1	12/18/19 0:00	cra/gkh
Temperature		1	19.2			C	0.1	0.1	12/18/19 0:00	cra/gkh
pH, Corrosivity	M9045D/M9040C									
pH		1	4.3	J 1,9		units	0.1	0.1	12/27/19 0:00	nnk
Temperature		1	22.9			C	0.1	0.1	12/27/19 0:00	nnk

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Meteoric Water Mobility Extraction	ASTM E2242-13									
Dry Weight		1	5000			g			12/17/19 0:00	gkh
Extraction pH		1	4.89			units			12/17/19 0:00	gkh
Extraction Temperature		1	23.0			C	0.1	0.1	12/17/19 0:00	gkh
Extraction Time		1	29.66667			hrs			12/17/19 0:00	gkh
Leachate Volume		1	5000.3			mL			12/17/19 0:00	gkh
Particle Size over 5 cm		1	0			%			12/17/19 0:00	gkh
Post Filter pH		1	4.34			units			12/17/19 0:00	gkh
Pre Filter pH		1	4.28			units			12/17/19 0:00	gkh
Retained Moisture		1	16.22			%			12/17/19 0:00	gkh
Temperature		1	19.2			C	0.1	0.1	12/17/19 0:00	gkh
Time In		1							12/17/19 0:00	gkh
Time Out		1							12/17/19 0:00	gkh

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33-FD_0.5-3
Field Duplicate ofSTSB33_0.5-3

ACZ Sample ID: ***L56331-07***
Date Sampled: *12/03/19 12:48*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity (MWMT)	SM2320B - Titration									
Bicarbonate as CaCO3		1	<2 ✓	U	*	mg/L	2	20	12/27/19 0:00	enb
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Total Alkalinity		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Chloride (MWMT)	SM4500Cl-E	1	4.3		*	mg/L	0.5	2	01/02/20 16:39	ttg
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation	0.5	<0.003 ✓	U	*	mg/L	0.003	0.01	01/01/20 15:27	wtc
Fluoride (MWMT)	SM4500F-C	25	17		*	mg/L	3	9	01/03/20 16:46	emk
Nitrate as N (MWMT)	Calculation: NO3NO2 minus NO2		0.35			mg/L	0.02	0.1	06/23/20 0:00	calc
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	0.35		*	mg/L	0.02	0.1	12/20/19 0:52	pjb
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.01	U	*	mg/L	0.01	0.05	12/20/19 0:52	pjb
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor	1	1.0		*	mg/L	0.1	0.5	01/07/20 22:33	pjb
Residue, Filterable (TDS) @180C (MWMT)	SM2540C	1	3310 ✓ J 1	H	*	mg/L	20	40	12/31/19 16:46	mlh
Sulfate (MWMT)	D516-07 - Turbidimetric	120	2110 ✓		*	mg/L	120	600	01/14/20 11:32	wtc

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB35_0.5-3

ACZ Sample ID: ***L56331-08***
Date Sampled: *12/03/19 14:41*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Cyanide, WAD (MWMT) Prep	SM4500-CN I		-						01/01/20 12:50	wtc
ICP MWMT Prep	M6010D ICP								12/20/19 14:53	kja
ICPMS MWMT Prep	M6020B ICP-MS								12/28/19 13:10	mfm
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor								01/07/20 13:42	mss2

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum (MWMT)	M6010D ICP	1	19.8		*	mg/L	0.05	0.3	12/23/19 21:34	kja
Antimony (MWMT)	M6020B ICP-MS	2	0.0009 ✓	B		mg/L	0.0008	0.004	01/02/20 13:08	mfm
Arsenic (MWMT)	M6020B ICP-MS	2	0.0049		*	mg/L	0.0004	0.002	01/02/20 13:08	mfm
Barium (MWMT)	M6010D ICP	1	0.036	B		mg/L	0.007	0.04	12/23/19 21:34	kja
Beryllium (MWMT)	M6020B ICP-MS	2	0.0029			mg/L	0.0002	0.0005	01/02/20 13:08	mfm
Boron (MWMT)	M6010D ICP	2	0.13 UJ 2	B	*	mg/L	0.04	0.2	12/26/19 13:11	jlw
Cadmium (MWMT)	M6020B ICP-MS	2	0.0023			mg/L	0.0001	0.0005	01/02/20 13:08	mfm
Calcium (MWMT)	M6010D ICP	2	502		*	mg/L	0.2	1	12/26/19 13:11	jlw
Chromium (MWMT)	M6020B ICP-MS	2	0.001	B		mg/L	0.001	0.004	01/02/20 13:08	mfm
Cobalt (MWMT)	M6020B ICP-MS	2	0.177		*	mg/L	0.0001	0.0005	01/02/20 13:08	mfm
Copper (MWMT)	M6020B ICP-MS	500	183 ✓		*	mg/L	0.4	1	01/03/20 19:40	bsu
Iron (MWMT)	M6010D ICP	1	0.59			mg/L	0.03	0.08	12/23/19 21:34	kja
Lead (MWMT)	M6020B ICP-MS	2	0.0003	B		mg/L	0.0002	0.001	01/02/20 13:08	mfm
Lithium (MWMT)	M6010D ICP	1	0.113 ✓		*	mg/L	0.008	0.04	12/23/19 21:34	kja
Magnesium (MWMT)	M6010D ICP	1	114			mg/L	0.2	1	12/23/19 21:34	kja
Manganese (MWMT)	M6020B ICP-MS	2	1.69		*	mg/L	0.0008	0.004	01/02/20 13:08	mfm
Mercury (MWMT)	M7470A CVAA	1	<0.0002	U	*	mg/L	0.0002	0.001	12/20/19 18:08	slm
Molybdenum (MWMT)	M6020B ICP-MS	2	<0.0004	U		mg/L	0.0004	0.001	01/02/20 13:08	mfm
Nickel (MWMT)	M6020B ICP-MS	2	0.182 ✓		*	mg/L	0.0008	0.002	01/02/20 13:08	mfm
Phosphorus (MWMT)	M6010D ICP	1	<0.1	U		mg/L	0.1	0.5	12/23/19 21:34	kja
Potassium (MWMT)	M6010D ICP	1	24.5			mg/L	0.2	1	12/23/19 21:34	kja
Selenium (MWMT)	M6020B ICP-MS	2	0.0051			mg/L	0.0002	0.0005	01/02/20 13:08	mfm
Silver (MWMT)	M6020B ICP-MS	2	<0.0002	U		mg/L	0.0002	0.001	01/02/20 13:08	mfm
Sodium (MWMT)	M6010D ICP	2	22.3 ✓		*	mg/L	0.4	2	12/26/19 13:11	jlw
Strontium (MWMT)	M6010D ICP	1	2.73 ✓			mg/L	0.009	0.05	12/23/19 21:34	kja
Thallium (MWMT)	M6020B ICP-MS	2	0.0007	B		mg/L	0.0002	0.001	01/02/20 13:08	mfm
Thorium (MWMT)	M6020B ICP-MS	2	<0.002	U	*	mg/L	0.002	0.01	01/02/20 13:08	mfm
Tin (MWMT)	M6010D ICP	1	<0.04	U		mg/L	0.04	0.2	12/23/19 21:34	kja
Titanium (MWMT)	M6010D ICP	1	0.024	B	*	mg/L	0.005	0.03	12/23/19 21:34	kja
Uranium (MWMT)	M6020B ICP-MS	2	0.0228			mg/L	0.0002	0.001	01/02/20 13:08	mfm
Vanadium (MWMT)	M6020B ICP-MS	2	<0.001	U		mg/L	0.001	0.004	01/02/20 13:08	mfm
Zinc (MWMT)	M6020B ICP-MS	2	0.429		*	mg/L	0.008	0.02	01/02/20 13:08	mfm

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB35_0.5-3

ACZ Sample ID: ***L56331-08***
Date Sampled: *12/03/19 14:41*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
pH (MWMT)	M9045D/M9040C									
pH		1	4.3 ✓			units	0.1	0.1	12/18/19 0:00	cra/gkh
Temperature		1	19.2			C	0.1	0.1	12/18/19 0:00	cra/gkh
pH, Corrosivity	M9045D/M9040C									
pH		1	4.2	J 1,9		units	0.1	0.1	12/27/19 0:00	nnk
Temperature		1	22.2			C	0.1	0.1	12/27/19 0:00	nnk

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Meteoric Water Mobility Extraction	ASTM E2242-13									
Dry Weight		1	5000			g			12/18/19 0:00	gkh
Extraction pH		1	4.89			units			12/18/19 0:00	gkh
Extraction Temperature		1	23.0			C	0.1	0.1	12/18/19 0:00	gkh
Extraction Time		1	29.5			hrs			12/18/19 0:00	gkh
Leachate Volume		1	5000			mL			12/18/19 0:00	gkh
Particle Size over 5 cm		1	0			%			12/18/19 0:00	gkh
Post Filter pH		1	4.21			units			12/18/19 0:00	gkh
Pre Filter pH		1	4.25			units			12/18/19 0:00	gkh
Retained Moisture		1	11.69			%			12/18/19 0:00	gkh
Temperature		1	19.2			C	0.1	0.1	12/18/19 0:00	gkh
Time In		1							12/18/19 0:00	gkh
Time Out		1							12/18/19 0:00	gkh

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB35_0.5-3

ACZ Sample ID: ***L56331-08***
Date Sampled: *12/03/19 14:41*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity (MWMT)	SM2320B - Titration									
Bicarbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Total Alkalinity		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Chloride (MWMT)	SM4500Cl-E	1	3.8		*	mg/L	0.5	2	01/02/20 16:39	ttg
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation	0.5	<0.003 ✓	U	*	mg/L	0.003	0.01	01/01/20 15:27	wtc
Fluoride (MWMT)	SM4500F-C	20	11 ✓		*	mg/L	2	7	01/03/20 16:54	emk
Nitrate as N (MWMT)	Calculation: NO3NO2 minus NO2		0.31			mg/L	0.02	0.1	06/23/20 0:00	calc
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	0.31 ✓		*	mg/L	0.02	0.1	12/20/19 0:58	pjb
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.01	U	*	mg/L	0.01	0.05	12/20/19 0:58	pjb
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor	1	0.6 ✓		*	mg/L	0.1	0.5	01/07/20 22:34	pjb
Residue, Filterable (TDS) @180C (MWMT)	SM2540C	1	3330 J 1	H	*	mg/L	20	40	12/31/19 16:49	mlh
Sulfate (MWMT)	D516-07 - Turbidimetric	120	1940		*	mg/L	120	600	01/14/20 11:33	wtc

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB35_6-15

ACZ Sample ID: ***L56331-09***
Date Sampled: *12/03/19 15:00*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Cyanide, WAD (MWMT) Prep	SM4500-CN I		-						01/01/20 13:00	wtc
ICP MWMT Prep	M6010D ICP								12/20/19 15:18	kja
ICPMS MWMT Prep	M6020B ICP-MS								12/28/19 13:22	mfm
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor								01/07/20 13:59	mss2

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum (MWMT)	M6010D ICP	1	48.1		*	mg/L	0.05	0.3	12/23/19 21:38	kja
Antimony (MWMT)	M6020B ICP-MS	5	<0.002	U		mg/L	0.002	0.01	01/02/20 13:10	mfm
Arsenic (MWMT)	M6020B ICP-MS	5	0.005 ✓		*	mg/L	0.001	0.005	01/02/20 13:10	mfm
Barium (MWMT)	M6010D ICP	1	0.009 ✓	B		mg/L	0.007	0.04	12/23/19 21:38	kja
Beryllium (MWMT)	M6020B ICP-MS	5	0.0067			mg/L	0.0004	0.001	01/02/20 13:10	mfm
Boron (MWMT)	M6010D ICP	2	✓ 0.15	UJ 2 B	*	mg/L	0.04	0.2	12/26/19 13:15	jlw
Cadmium (MWMT)	M6020B ICP-MS	5	0.0076			mg/L	0.0003	0.001	01/02/20 13:10	mfm
Calcium (MWMT)	M6010D ICP	1	471		*	mg/L	0.1	0.5	12/23/19 21:38	kja
Chromium (MWMT)	M6020B ICP-MS	5	0.006	B		mg/L	0.003	0.01	01/02/20 13:10	mfm
Cobalt (MWMT)	M6020B ICP-MS	5	0.551		*	mg/L	0.0003	0.001	01/02/20 13:10	mfm
Copper (MWMT)	M6020B ICP-MS	2000	505 ✓		*	mg/L	2	4	01/03/20 19:42	bsu
Iron (MWMT)	M6010D ICP	1	3.32			mg/L	0.03	0.08	12/23/19 21:38	kja
Lead (MWMT)	M6020B ICP-MS	5	0.0018	B		mg/L	0.0005	0.003	01/02/20 13:10	mfm
Lithium (MWMT)	M6010D ICP	1	0.091		*	mg/L	0.008	0.04	12/23/19 21:38	kja
Magnesium (MWMT)	M6010D ICP	1	183 ✓			mg/L	0.2	1	12/23/19 21:38	kja
Manganese (MWMT)	M6020B ICP-MS	5	5.02		*	mg/L	0.002	0.01	01/02/20 13:10	mfm
Mercury (MWMT)	M7470A CVAA	1	0.0007 ✓	B	*	mg/L	0.0002	0.001	12/20/19 18:08	slm
Molybdenum (MWMT)	M6020B ICP-MS	5	<0.001	U		mg/L	0.001	0.003	01/02/20 13:10	mfm
Nickel (MWMT)	M6020B ICP-MS	5	0.397		*	mg/L	0.002	0.005	01/02/20 13:10	mfm
Phosphorus (MWMT)	M6010D ICP	5	<0.5	UJ 4L	*	mg/L	0.5	3	12/26/19 22:54	jlw
Potassium (MWMT)	M6010D ICP	1	17.1			mg/L	0.2	1	12/23/19 21:38	kja
Selenium (MWMT)	M6020B ICP-MS	5	0.0187			mg/L	0.0005	0.001	01/02/20 13:10	mfm
Silver (MWMT)	M6020B ICP-MS	5	<0.0005	U		mg/L	0.0005	0.003	01/02/20 13:10	mfm
Sodium (MWMT)	M6010D ICP	1	36.1		*	mg/L	0.2	1	12/23/19 21:38	kja
Strontium (MWMT)	M6010D ICP	1	1.19			mg/L	0.009	0.05	12/23/19 21:38	kja
Thallium (MWMT)	M6020B ICP-MS	5	0.0017	B		mg/L	0.0005	0.003	01/02/20 13:10	mfm
Thorium (MWMT)	M6020B ICP-MS	5	<0.005	U	*	mg/L	0.005	0.03	01/02/20 13:10	mfm
Tin (MWMT)	M6010D ICP	1	<0.04	U		mg/L	0.04	0.2	12/23/19 21:38	kja
Titanium (MWMT)	M6010D ICP	1	0.033		*	mg/L	0.005	0.03	12/23/19 21:38	kja
Uranium (MWMT)	M6020B ICP-MS	5	0.133			mg/L	0.0005	0.003	01/02/20 13:10	mfm
Vanadium (MWMT)	M6020B ICP-MS	5	<0.003	U		mg/L	0.003	0.01	01/02/20 13:10	mfm
Zinc (MWMT)	M6020B ICP-MS	5	1.49		*	mg/L	0.02	0.05	01/02/20 13:10	mfm

REPIN.02.06.05.01

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB35_6-15

ACZ Sample ID: ***L56331-09***
Date Sampled: *12/03/19 15:00*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Soil Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
pH (MWMT)	M9045D/M9040C									
pH		1	3.9			units	0.1	0.1	12/18/19 0:00	cra/gkh
Temperature		1	19.4			C	0.1	0.1	12/18/19 0:00	cra/gkh
pH, Corrosivity	M9045D/M9040C									
pH		1	3.9 ✓	J 1,9		units	0.1	0.1	12/27/19 0:00	nnk
Temperature		1	22.5			C	0.1	0.1	12/27/19 0:00	nnk

Soil Preparation

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Meteoric Water Mobility Extraction	ASTM E2242-13									
Dry Weight		1	5000			g			12/18/19 0:00	gkh
Extraction pH		1	4.89			units			12/18/19 0:00	gkh
Extraction Temperature		1	23.0			C	0.1	0.1	12/18/19 0:00	gkh
Extraction Time		1	29.5			hrs			12/18/19 0:00	gkh
Leachate Volume		1	5004.4			mL			12/18/19 0:00	gkh
Particle Size over 5 cm		1	0			%			12/18/19 0:00	gkh
Post Filter pH		1	3.8			units			12/18/19 0:00	gkh
Pre Filter pH		1	3.87			units			12/18/19 0:00	gkh
Retained Moisture		1	11.16			%			12/18/19 0:00	gkh
Temperature		1	19.4			C	0.1	0.1	12/18/19 0:00	gkh
Time In		1							12/18/19 0:00	gkh
Time Out		1							12/18/19 0:00	gkh

** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB35_6-15

ACZ Sample ID: ***L56331-09***
Date Sampled: *12/03/19 15:00*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity (MWMT)	SM2320B - Titration									
Bicarbonate as CaCO3		1	<2 ✓	U	*	mg/L	2	20	12/27/19 0:00	enb
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Total Alkalinity		1	<2	U	*	mg/L	2	20	12/27/19 0:00	enb
Chloride (MWMT)	SM4500Cl-E	1	6.7 ✓		*	mg/L	0.5	2	01/02/20 16:39	ttg
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation	0.5	<0.003	U	*	mg/L	0.003	0.01	01/01/20 15:28	wtc
Fluoride (MWMT)	SM4500F-C	50	25		*	mg/L	6	20	01/03/20 17:01	emk
Nitrate as N (MWMT)	Calculation: NO3NO2 minus NO2		<0.02	U		mg/L	0.02	0.1	06/23/20 0:00	calc
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.02	U	*	mg/L	0.02	0.1	12/20/19 0:59	pjb
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction	1	<0.01	U	*	mg/L	0.01	0.05	12/20/19 0:59	pjb
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor	1	1.1		*	mg/L	0.1	0.5	01/07/20 22:35	pjb
Residue, Filterable (TDS) @180C (MWMT)	SM2540C	2	4910 ✓ J 1	H	*	mg/L	40	80	12/31/19 16:53	mlh
Sulfate (MWMT)	D516-07 - Turbidimetric	120	3200 ✓		*	mg/L	120	600	01/14/20 11:33	wtc

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4) EPA SW-846. Test Methods for Evaluating Solid Waste.
(5) Standard Methods for the Examination of Water and Wastewater.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:
https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic QC Summary

Wood - E&I Solutions, Inc.

ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Alkalinity as CaCO3 SM2320B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488883													
WG488883PBW	PBW	12/27/19 12:57				U	mg/L		-20	20			
WG488883LCSW1	LCSW	12/27/19 13:09	WC191226-5	820.0001		801	mg/L	98	90	110			
WG488184PBS	PBS	12/27/19 13:18				6.1	mg/L		-20	20			
L56331-09DUP	DUP	12/27/19 14:12			U	U	mg/L				0	20	RA
WG488413PBS	PBS	12/27/19 14:17				U	mg/L		-20	20			
WG488496PBS	PBS	12/27/19 14:34				3.1	mg/L		-20	20			
WG488883LCSW2	LCSW	12/27/19 15:37	WC191226-5	820.0001		790	mg/L	96	90	110			

Aluminum (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	2		2.011	mg/L	101	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.15	0.15			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.2503		.269	mg/L	107	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	250.3		247.8	mg/L	99	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.15	0.15			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	1.0012		1.013	mg/L	101	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	1.0012	27.5	28.49	mg/L	99	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	1.0012	27.5	29.06	mg/L	156	75	125	2	20	M3
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	1		.984	mg/L	98	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.15	0.15			
L56331-09SDL	SDL	12/23/19 21:42			48.1	50.55	mg/L				5	10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	1		.988	mg/L	99	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.15	0.15			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Antimony (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.02004		.02044	mg/L	102	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0012	0.0012			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.002		.00208	mg/L	104	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.002	0.002			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.01		.01116	mg/L	112	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0012	0.0012			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.01		.01018	mg/L	102	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0012	0.0012			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.0125		.0124	mg/L	99	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0012	0.0012			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.01	U	.01027	mg/L	103	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.01	U	.01059	mg/L	106	75	125	3	20	
L56331-06SDL	SDL	01/02/20 13:05			.001	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.01		.01017	mg/L	102	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0012	0.0012			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.0125		.01183	mg/L	95	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0012	0.0012			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.01		.0099	mg/L	99	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.0125		.01191	mg/L	95	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0012	0.0012			

Arsenic (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.05025	mg/L	101	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0006	0.0006			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.001001		.00109	mg/L	109	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.001	0.001			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02002		.02048	mg/L	102	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0006	0.0006			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05005		.04834	mg/L	97	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0006	0.0006			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1001		.10397	mg/L	104	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0006	0.0006			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05005	.0048	.0498	mg/L	90	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05005	.0048	.05233	mg/L	95	75	125	5	20	
L56331-06SDL	SDL	01/02/20 13:05			.0009	.0011	mg/L				22	10	ZG
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05005		.04909	mg/L	98	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0006	0.0006			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1001		.0959	mg/L	96	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0006	0.0006			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05005		.04843	mg/L	97	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1001		.09907	mg/L	99	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0006	0.0006			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Barium (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	2		1.999	mg/L	100	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.021	0.021			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.035035		.0378	mg/L	108	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	.25025		.2475	mg/L	99	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.021	0.021			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	.5005		.496	mg/L	99	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	.5005	.015	.4796	mg/L	93	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	.5005	.015	.4839	mg/L	94	75	125	1	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	1		.9801	mg/L	98	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.021	0.021			
L56331-09SDL	SDL	12/23/19 21:42			.009	U	mg/L					10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	1		.9797	mg/L	98	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.021	0.021			

Beryllium (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.048364	mg/L	97	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.00024	0.00024			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.00025025		.000251	mg/L	100	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.0003	0.0003			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02002		.019348	mg/L	97	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.00024	0.00024			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05005		.04651	mg/L	93	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.00024	0.00024			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1001		.096001	mg/L	96	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.00024	0.00024			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05005	.007	.049	mg/L	84	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05005	.007	.04951	mg/L	85	75	125	1	20	
L56331-06SDL	SDL	01/02/20 13:05			U	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05005		.043819	mg/L	88	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.00024	0.00024			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1001		.091771	mg/L	92	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.00024	0.00024			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05005		.044409	mg/L	89	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1001		.095421	mg/L	95	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.00024	0.00024			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Boron (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488806													
WG488806ICV	ICV	12/26/19 11:49	II191209-2	2		2.026	mg/L	101	90	110			
WG488806ICB	ICB	12/26/19 11:53				U	mg/L		-0.06	0.06			
WG488806PQV	PQV	12/26/19 11:57	II191223-3	.1001		.103	mg/L	103	70	130			
WG488806ICSAB	ICSAB	12/26/19 12:01	II191127-4	.5005		.498	mg/L	100	80	120			
WG488184PBS	PBS	12/26/19 12:17				.243	mg/L		-0.06	0.06			B1
WG488184LFB1	LFB	12/26/19 12:21	II191204-3	.5005		.743	mg/L	148	80	120			B1
L56331-05MS2	MS	12/26/19 12:44	II191204-3	.5005	.12	.6	mg/L	96	75	125			
L56331-05MSD2	MSD	12/26/19 12:48	II191204-3	.5005	.12	.605	mg/L	97	75	125	1	20	
WG488806CCV1	CCV	12/26/19 12:55	II191204-1	1		.988	mg/L	99	90	110			
WG488806CCB1	CCB	12/26/19 12:59				U	mg/L		-0.06	0.06			
L56331-06SDL	SDL	12/26/19 13:03			.16	.165	mg/L				3	10	
WG488806CCV2	CCV	12/26/19 13:19	II191204-1	1		.983	mg/L	98	90	110			
WG488806CCB2	CCB	12/26/19 13:23				U	mg/L		-0.06	0.06			

Cadmium (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.049494	mg/L	99	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.00015	0.00015			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.00025025		.000254	mg/L	101	70	130			
WG489196ICSA	ICSA	01/02/20 12:29		.000183		.000183	mg/L		-0.0003	0.0003			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02002		.020083	mg/L	100	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.00015	0.00015			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05005		.048116	mg/L	96	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.00015	0.00015			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1001		.099903	mg/L	100	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.00015	0.00015			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05005	.0036	.04987	mg/L	92	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05005	.0036	.05108	mg/L	95	75	125	2	20	
L56331-06SDL	SDL	01/02/20 13:05			.00008	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05005		.047224	mg/L	94	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.00015	0.00015			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1001		.096934	mg/L	97	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.00015	0.00015			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05005		.046042	mg/L	92	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1001		.097111	mg/L	97	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.00015	0.00015			

Wood - E&I Solutions, Inc.

ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Calcium (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	100		98.85	mg/L	99	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.3	0.3			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.5004		.55	mg/L	110	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	250.3		248.6	mg/L	99	80	120			
WG488184PBS	PBS	12/23/19 20:44				.62	mg/L		-0.3	0.3			BA
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	68.00334		70.46	mg/L	104	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	68.00334	497	568.2	mg/L	105	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	68.00334	497	574.7	mg/L	114	75	125	1	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	50		48.14	mg/L	96	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.3	0.3			
L56331-09SDL	SDL	12/23/19 21:42			471	493.4	mg/L				5	10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	50		47.92	mg/L	96	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.3	0.3			
WG488806													
WG488806ICV	ICV	12/26/19 11:49	II191209-2	100		99.14	mg/L	99	90	110			
WG488806ICB	ICB	12/26/19 11:53				U	mg/L		-0.3	0.3			
WG488806PQV	PQV	12/26/19 11:57	II191223-3	.5006		.45	mg/L	90	70	130			
WG488806ICSAB	ICSAB	12/26/19 12:01	II191127-4	250.3		243.8	mg/L	97	80	120			
WG488184PBS	PBS	12/26/19 12:17				.52	mg/L		-0.3	0.3			BA
WG488184LFB1	LFB	12/26/19 12:21	II191204-3	68.00334		68.02	mg/L	100	80	120			
L56331-05MS2	MS	12/26/19 12:44	II191204-3	68.00334	477	547.4	mg/L	104	75	125			
L56331-05MSD2	MSD	12/26/19 12:48	II191204-3	68.00334	477	559.4	mg/L	121	75	125	2	20	
WG488806CCV1	CCV	12/26/19 12:55	II191204-1	50		49.11	mg/L	98	90	110			
WG488806CCB1	CCB	12/26/19 12:59				U	mg/L		-0.3	0.3			
L56331-06SDL	SDL	12/26/19 13:03			215	219.8	mg/L				2	10	
WG488806CCV2	CCV	12/26/19 13:19	II191204-1	50		48.34	mg/L	97	90	110			
WG488806CCB2	CCB	12/26/19 13:23				U	mg/L		-0.3	0.3			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Chloride (MWMT) SM4500Cl-E

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489256													
WG489256ICB	ICB	01/02/20 15:38				U	mg/L		-1.5	1.5			
WG489256ICV	ICV	01/02/20 15:38	WI190501-1	54.835		52.79	mg/L	96	90	110			
WG489256CCV1	CCV	01/02/20 16:37	WI190111-5	50.05		48.82	mg/L	98	90	110			
WG489256CCB1	CCB	01/02/20 16:37				U	mg/L		-1.5	1.5			
WG489256LFB	LFB	01/02/20 16:37	WI190812-3	30		31.51	mg/L	105	90	110			
WG488184PBS	PBS	01/02/20 16:37				U	mg/L		-1.5	1.5			
L56331-02AS	AS	01/02/20 16:37	WI190812-3	30	17.1	44.35	mg/L	91	90	110			
WG489256CCV2	CCV	01/02/20 16:39	WI190111-5	50.05		48.93	mg/L	98	90	110			
WG489256CCB2	CCB	01/02/20 16:39				U	mg/L		-1.5	1.5			
WG488413PBS	PBS	01/02/20 16:39				U	mg/L		-1.5	1.5			
WG488496PBS	PBS	01/02/20 16:39				U	mg/L		-1.5	1.5			
WG489256CCV3	CCV	01/02/20 16:40	WI190111-5	50.05		48.39	mg/L	97	90	110			
WG489256CCB3	CCB	01/02/20 16:40				U	mg/L		-1.5	1.5			
WG489256CCV4	CCV	01/02/20 16:40	WI190111-5	50.05		48.65	mg/L	97	90	110			
WG489256CCB4	CCB	01/02/20 16:40				U	mg/L		-1.5	1.5			
WG489256CCV5	CCV	01/02/20 16:48	WI190111-5	50.05		48.95	mg/L	98	90	110			
WG489256CCB5	CCB	01/02/20 16:48				U	mg/L		-1.5	1.5			

Chromium (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.05209	mg/L	104	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0015	0.0015			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.002002		.00198	mg/L	99	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.002	0.002			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02002		.01977	mg/L	99	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0015	0.0015			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05005		.04812	mg/L	96	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0015	0.0015			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1001		.1027	mg/L	103	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0015	0.0015			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05005	.001	.0455	mg/L	89	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05005	.001	.048	mg/L	94	75	125	5	20	
L56331-06SDL	SDL	01/02/20 13:05			U	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05005		.04775	mg/L	95	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0015	0.0015			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1001		.0945	mg/L	94	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0015	0.0015			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05005		.04692	mg/L	94	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1001		.09732	mg/L	97	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0015	0.0015			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Cobalt (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.052623	mg/L	105	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.00015	0.00015			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.00025025		.000241	mg/L	96	70	130			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02002		.01911	mg/L	95	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.00015	0.00015			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05005		.047881	mg/L	96	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.00015	0.00015			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1001		.098177	mg/L	98	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.00015	0.00015			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05005	.5114	.54602	mg/L	69	75	125			M3
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05005	.5114	.54991	mg/L	77	75	125	1	20	
L56331-06SDL	SDL	01/02/20 13:05			.00383	.004215	mg/L				10	10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05005		.0462	mg/L	92	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.00015	0.00015			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1001		.096249	mg/L	96	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.00015	0.00015			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05005		.046258	mg/L	92	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1001		.097764	mg/L	98	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.00015	0.00015			

Copper (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489377													
WG489377ICV	ICV	01/03/20 19:05	MS191231-8	.05		.05173	mg/L	103	90	110			
WG489377ICB	ICB	01/03/20 19:07				U	mg/L		-0.0024	0.0024			
WG489377PQV	PQV	01/03/20 19:09	MS191231-5	.002004		.00209	mg/L	104	70	130			
WG489377ICSA	ICSA	01/03/20 19:11				U	mg/L		-0.002	0.002			
WG489377ICSAB	ICSAB	01/03/20 19:13	MS191119-7	.02004		.01767	mg/L	88	80	120			
WG488184PBS	PBS	01/03/20 19:16				U	mg/L		-0.0024	0.0024			
WG488184LFB2	LFB	01/03/20 19:18	MS191119-5	.0501		.04937	mg/L	99	80	120			
WG489377CCV1	CCV	01/03/20 19:29	MS191231-2	.2505		.24849	mg/L	99	90	110			
WG489377CCB1	CCB	01/03/20 19:31				U	mg/L		-0.0024	0.0024			
L56331-05MS1	MS	01/03/20 19:33	MS191119-5	.0501	170	175.95	mg/L	11876	75	125			M3
L56331-05MSD1	MSD	01/03/20 19:35	MS191119-5	.0501	170	175.27	mg/L	10519	75	125	0	20	M3
WG489377CCV2	CCV	01/03/20 19:44	MS191231-2	.2505		.24608	mg/L	98	90	110			
WG489377CCB2	CCB	01/03/20 19:46				U	mg/L		-0.0024	0.0024			
WG488496PBS	PBS	01/03/20 19:48				.0019	mg/L		-0.0024	0.0024			
WG488496LFB2	LFB	01/03/20 19:50	MS191119-5	.0501		.05011	mg/L	100	80	120			
WG489377CCV3	CCV	01/03/20 20:06	MS191231-2	.2505		.24669	mg/L	98	90	110			
WG489377CCB3	CCB	01/03/20 20:08				U	mg/L		-0.0024	0.0024			
L56453-06SDL	SDL	01/03/20 20:10			.055	.05875	mg/L				7	10	
WG489377CCV4	CCV	01/03/20 20:12	MS191231-2	.2505		.24694	mg/L	99	90	110			
WG489377CCB4	CCB	01/03/20 20:14				U	mg/L		-0.0024	0.0024			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Cyanide, WAD (MWMT) SM4500-CN I,E-Colorimetric w/ distillation

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489180													
WG489180ICV	ICV	01/01/20 15:13	WI191230-10	.3		.2894	mg/L	96	90	110			
WG489180ICB	ICB	01/01/20 15:14				U	mg/L		-0.003	0.003			
WG489180LRB	LRB	01/01/20 15:15				U	mg/L		-0.003	0.003			
WG489180LFB	LFB	01/01/20 15:16	WI191230-7	.2		.1909	mg/L	95	90	110			
WG488184PBS	PBS	01/01/20 15:17				U	mg/L		-0.003	0.003			
L56331-01DUP	DUP	01/01/20 15:19			U	U	mg/L				0	20	RA
L56331-02LFM	LFM	01/01/20 15:20	WI191230-7	.2	U	.1505	mg/L	75	90	110			M2
WG489180CCV1	CCV	01/01/20 15:24	WI191230-5	.25		.2513	mg/L	101	90	110			
WG489180CCB1	CCB	01/01/20 15:25				U	mg/L		-0.003	0.003			
WG489180CCV2	CCV	01/01/20 15:31	WI191230-5	.25		.2542	mg/L	102	90	110			
WG489180CCB2	CCB	01/01/20 15:32				U	mg/L		-0.003	0.003			

Fluoride (MWMT) SM4500F-C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489301													
WG489301ICV	ICV	01/03/20 9:05	WC191231-1	2.004		2.09	mg/L	104	90	110			
WG489301ICB	ICB	01/03/20 9:15				U	mg/L		-0.3	0.3			
WG489345													
WG489345ICV	ICV	01/03/20 15:23	WC191231-1	2.004		2.08	mg/L	104	90	110			
WG489345ICB	ICB	01/03/20 15:29				U	mg/L		-0.3	0.3			
WG489345PQV	PQV	01/03/20 15:33	WC200102-7	.3507		.39	mg/L	111	70	130			
WG489345LFB	LFB	01/03/20 15:36	WC191014-1	5.01		5.14	mg/L	103	90	110			
WG488184PBS	PBS	01/03/20 15:41				.15	mg/L		-0.3	0.3			
L56331-01AS	AS	01/03/20 15:57	WC191014-1	150.3	16	136.4	mg/L	80	90	110			M2
L56331-01ASD	ASD	01/03/20 16:04	WC191014-1	150.3	16	144	mg/L	85	90	110	5	20	M2
WG488413PBS	PBS	01/03/20 17:09				U	mg/L		-0.3	0.3			
WG489345CCV1	CCV	01/03/20 17:25	WC191231-1	2.004		2.11	mg/L	105	90	110			
WG489345CCB1	CCB	01/03/20 17:30				U	mg/L		-0.3	0.3			
WG489345CCB2	CCB	01/03/20 18:35				.29	mg/L		-0.3	0.3			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Iron (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	2		1.932	mg/L	97	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.09	0.09			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.075135		.074	mg/L	98	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	100.18		94.5	mg/L	94	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.09	0.09			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	1.0018		1.014	mg/L	101	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	1.0018	.17	1.104	mg/L	93	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	1.0018	.17	1.112	mg/L	94	75	125	1	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	1		.952	mg/L	95	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.09	0.09			
L56331-09SDL	SDL	12/23/19 21:42			3.32	3.52	mg/L				6	10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	1		.941	mg/L	94	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.09	0.09			

Lead (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.05082	mg/L	102	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0003	0.0003			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.0005005		.00049	mg/L	98	70	130			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02002		.02041	mg/L	102	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0003	0.0003			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05005		.04791	mg/L	96	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0003	0.0003			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.25025		.24654	mg/L	99	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0003	0.0003			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05005	.0007	.05042	mg/L	99	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05005	.0007	.05138	mg/L	101	75	125	2	20	
L56331-06SDL	SDL	01/02/20 13:05			U	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05005		.04739	mg/L	95	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0003	0.0003			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.25025		.23738	mg/L	95	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0003	0.0003			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05005		.04737	mg/L	95	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.25025		.24198	mg/L	97	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0003	0.0003			

Wood - E&I Solutions, Inc.

ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Lithium (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	2		1.979	mg/L	99	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.024	0.024			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.04008		.0446	mg/L	111	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	.501		.4981	mg/L	99	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.024	0.024			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	1.002		.9929	mg/L	99	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	1.002	.219	1.185	mg/L	96	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	1.002	.219	1.198	mg/L	98	75	125	1	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	1		.9691	mg/L	97	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.024	0.024			
L56331-09SDL	SDL	12/23/19 21:42			.091	.108	mg/L				19	10	ZG
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	1		.974	mg/L	97	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.024	0.024			

Magnesium (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	100		97.09	mg/L	97	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.6	0.6			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	1		.94	mg/L	94	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	250		253.6	mg/L	101	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.6	0.6			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	49.99771		50.23	mg/L	100	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	49.99771	97.3	146.8	mg/L	99	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	49.99771	97.3	148.5	mg/L	102	75	125	1	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	50		47.73	mg/L	95	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.6	0.6			
L56331-09SDL	SDL	12/23/19 21:42			183	188.4	mg/L				3	10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	50		47.52	mg/L	95	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.6	0.6			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Manganese (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.05104	mg/L	102	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0012	0.0012			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.002004		.00195	mg/L	97	70	130			
WG489196ICSA	ICSA	01/02/20 12:29		.00095		.00095	mg/L		-0.002	0.002			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02004		.01975	mg/L	99	80	120			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.0501		.05216	mg/L	104	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0012	0.0012			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1002		.1004	mg/L	100	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0012	0.0012			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.0501	4.49	4.48338	mg/L	-13	75	125			M3
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.0501	4.49	4.55277	mg/L	125	75	125	2	20	
L56331-06SDL	SDL	01/02/20 13:05			.6203	.68355	mg/L				10	10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.0501		.04658	mg/L	93	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0012	0.0012			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1002		.09713	mg/L	97	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0012	0.0012			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.0501		.04617	mg/L	92	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1002		.09821	mg/L	98	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0012	0.0012			
WG489377													
WG489377ICV	ICV	01/03/20 19:05	MS191231-8	.05		.04966	mg/L	99	90	110			
WG489377ICB	ICB	01/03/20 19:07				U	mg/L		-0.0012	0.0012			
WG489377PQV	PQV	01/03/20 19:09	MS191231-5	.002004		.00207	mg/L	103	70	130			
WG489377ICSA	ICSA	01/03/20 19:11		.00045		.00045	mg/L		-0.002	0.002			
WG489377ICSAB	ICSAB	01/03/20 19:13	MS191119-7	.02004		.01842	mg/L	92	80	120			
WG488184PBS	PBS	01/03/20 19:16				U	mg/L		-0.0012	0.0012			
WG488184LFB2	LFB	01/03/20 19:18	MS191119-5	.0501		.04926	mg/L	98	80	120			
WG489377CCV1	CCV	01/03/20 19:29	MS191231-2	.1002		.09952	mg/L	99	90	110			
WG489377CCB1	CCB	01/03/20 19:31				U	mg/L		-0.0012	0.0012			
L56331-05MS1	MS	01/03/20 19:33	MS191119-5	.0501	5.3	5.33	mg/L	60	75	125			M3
L56331-05MSD1	MSD	01/03/20 19:35	MS191119-5	.0501	5.3	5.32	mg/L	40	75	125	0	20	M3
WG489377CCV2	CCV	01/03/20 19:44	MS191231-2	.1002		.09903	mg/L	99	90	110			
WG489377CCB2	CCB	01/03/20 19:46				U	mg/L		-0.0012	0.0012			
WG488496PBS	PBS	01/03/20 19:48				U	mg/L		-0.0012	0.0012			
WG488496LFB2	LFB	01/03/20 19:50	MS191119-5	.0501		.04816	mg/L	96	80	120			
WG489377CCV3	CCV	01/03/20 20:06	MS191231-2	.1002		.09858	mg/L	98	90	110			
WG489377CCB3	CCB	01/03/20 20:08				U	mg/L		-0.0012	0.0012			
L56453-06SDL	SDL	01/03/20 20:10			.4832	.4735	mg/L				2	10	
WG489377CCV4	CCV	01/03/20 20:12	MS191231-2	.1002		.09767	mg/L	97	90	110			
WG489377CCB4	CCB	01/03/20 20:14				U	mg/L		-0.0012	0.0012			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Mercury (MWMT) M7470A CVAA

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488445													
WG488445ICV	ICV	12/20/19 12:40	HG191211-3	.004995		.00523	mg/L	105	95	105			
WG488445ICB	ICB	12/20/19 12:41				U	mg/L		-0.0002	0.0002			
WG488654													
WG488654CCV1	CCV	12/20/19 17:52	HG191211-3	.004995		.00485	mg/L	97	90	110			
WG488654CCB1	CCB	12/20/19 17:53				U	mg/L		-0.0006	0.0006			
WG488654PQV	PQV	12/20/19 17:54	HG191211-5	.001001		.001	mg/L	100	70	130			
WG488184PBS	PBS	12/20/19 17:55				U	mg/L		-0.0006	0.0006			
WG488184LFB1	LFB	12/20/19 17:56	HG191211-6	.002002		.00194	mg/L	97	85	115			
L56331-05MS2	MS	12/20/19 18:02	HG191211-6	.002002	U	.00187	mg/L	93	85	115			
L56331-05MSD2	MSD	12/20/19 18:03	HG191211-6	.002002	U	.00194	mg/L	97	85	115	4	20	
WG488654CCV2	CCV	12/20/19 18:04	HG191211-3	.004995		.00476	mg/L	95	90	110			
WG488654CCB2	CCB	12/20/19 18:05				U	mg/L		-0.0006	0.0006			
WG488654CCV3	CCV	12/20/19 18:09	HG191211-3	.004995		.00472	mg/L	94	90	110			
WG488654CCB3	CCB	12/20/19 18:10				U	mg/L		-0.0006	0.0006			

Molybdenum (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.0199		.01884	mg/L	95	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0006	0.0006			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.000501		.00047	mg/L	94	70	130			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	1.02004		1.05695	mg/L	104	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0006	0.0006			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.0501		.04689	mg/L	94	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0006	0.0006			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1002		.09822	mg/L	98	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0006	0.0006			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.0501	U	.04734	mg/L	94	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.0501	U	.04892	mg/L	98	75	125	3	20	
L56331-06SDL	SDL	01/02/20 13:05			.0556	.0534	mg/L				4	10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.0501		.04533	mg/L	90	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0006	0.0006			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1002		.09399	mg/L	94	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0006	0.0006			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.0501		.04465	mg/L	89	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1002		.09467	mg/L	94	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0006	0.0006			

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NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Nickel (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.05176	mg/L	104	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0012	0.0012			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.001		.00101	mg/L	101	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.001	0.001			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02		.0186	mg/L	93	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0012	0.0012			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05		.04728	mg/L	95	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0012	0.0012			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.25		.25804	mg/L	103	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0012	0.0012			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05	.3142	.34913	mg/L	70	75	125			M3
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05	.3142	.36869	mg/L	109	75	125	5	20	
L56331-06SDL	SDL	01/02/20 13:05			.003	.00325	mg/L				8	10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05		.04727	mg/L	95	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0012	0.0012			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.25		.23562	mg/L	94	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0012	0.0012			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05		.04708	mg/L	94	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.25		.24539	mg/L	98	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0012	0.0012			

Nitrate/Nitrite as N (MWMT) M353.2 - Automated Cadmium Reduction

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488593													
WG488593ICV	ICV	12/19/19 22:36	WI191112-1	2.416		2.387	mg/L	99	90	110			
WG488593ICB	ICB	12/19/19 22:37				U	mg/L		-0.02	0.02			
WG488598													
WG488598CCV1	CCV	12/20/19 0:37	WI191219-1	2		1.983	mg/L	99	90	110			
WG488598CCB1	CCB	12/20/19 0:40				U	mg/L		-0.02	0.02			
WG488598LFB	LFB	12/20/19 0:41	WI191004-3	2		1.984	mg/L	99	90	110			
WG488184PBS	PBS	12/20/19 0:42				U	mg/L		-0.02	0.02			
WG488598CCV2	CCV	12/20/19 0:54	WI191219-1	2		1.997	mg/L	100	90	110			
WG488598CCB2	CCB	12/20/19 0:57				U	mg/L		-0.02	0.02			
WG488598CCV3	CCV	12/20/19 1:03	WI191219-1	2		1.989	mg/L	99	90	110			
WG488598CCB3	CCB	12/20/19 1:06				U	mg/L		-0.02	0.02			

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NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Nitrite as N (MWMT) M353.2 - Automated Cadmium Reduction

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488593													
WG488593ICV	ICV	12/19/19 22:36	WI191112-1	.609		.604	mg/L	99	90	110			
WG488593ICB	ICB	12/19/19 22:37				U	mg/L		-0.01	0.01			
WG488598													
WG488598CCV1	CCV	12/20/19 0:37	WI191219-1	1		.991	mg/L	99	90	110			
WG488598CCB1	CCB	12/20/19 0:40				U	mg/L		-0.01	0.01			
WG488598LFB	LFB	12/20/19 0:41	WI191004-3	1		.995	mg/L	100	90	110			
WG488184PBS	PBS	12/20/19 0:42				U	mg/L		-0.01	0.01			
WG488598CCV2	CCV	12/20/19 0:54	WI191219-1	1		.99	mg/L	99	90	110			
WG488598CCB2	CCB	12/20/19 0:57				U	mg/L		-0.01	0.01			
WG488598CCV3	CCV	12/20/19 1:03	WI191219-1	1		.988	mg/L	99	90	110			
WG488598CCB3	CCB	12/20/19 1:06				U	mg/L		-0.01	0.01			

Nitrogen, total Kjeldahl (MWMT) M351.2 - Block Digestor

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489518													
WG489518ICV	ICV	01/07/20 22:16	WI191227-6	4		3.91	mg/L	98	90	110			
WG489518ICB	ICB	01/07/20 22:17				U	mg/L		-0.1	0.1			
WG489472PBS	PBS	01/07/20 22:18				U	%		-0.1	0.1			
WG489472LFB	LFB	01/07/20 22:19	WI191227-2	2.5		2.49	mg/L	100	90	110			
WG488184PBS	PBS	01/07/20 22:21				U	%		-0.1	0.1			
L56331-01MS	MS	01/07/20 22:23	WI191227-2	2.5	2.2	4.7	mg/L	100	90	110			
L56331-02DUP	DUP	01/07/20 22:25			.5	.49	mg/L				2	20	RA
WG489518CCV1	CCV	01/07/20 22:30	WI191227-4	2.5		2.48	mg/L	99	90	110			
WG489518CCB1	CCB	01/07/20 22:31				U	mg/L		-0.1	0.1			
WG488496PBS	PBS	01/07/20 22:36				U	%		-0.1	0.1			
WG489518CCV2	CCV	01/07/20 22:43	WI191227-4	2.5		2.51	mg/L	100	90	110			
WG489518CCB2	CCB	01/07/20 22:44				U	mg/L		-0.1	0.1			
WG489518CCV3	CCV	01/07/20 22:48	WI191227-4	2.5		2.47	mg/L	99	90	110			
WG489518CCB3	CCB	01/07/20 22:49				U	mg/L		-0.1	0.1			

Ph M9045D/M9040C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489500													
WG489500ICV	ICV	12/18/19 11:04	PCN58503	4		4	units	100	3.9	4.1			
WG489500CCV	CCV	12/18/19 17:59	PCN58503	4		4	units	100	3.9	4.1			
WG488749													
WG488749ICV	ICV	12/27/19 9:21	PCN58503	4		4.1	units	103	3.9	4.1			
L56331-04DUP	DUP	12/27/19 10:05			5.1	5.2	units				2	20	
WG488749CCV1	CCV	12/27/19 10:41	PCN58503	4		4	units	100	3.9	4.1			
WG488749CCV2	CCV	12/27/19 11:25	PCN58503	4		4	units	100	3.9	4.1			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

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Phosphorus (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	5.0075		4.99	mg/L	100	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.3	0.3			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.502		.55	mg/L	110	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	5.02		4.93	mg/L	98	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.3	0.3			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	1.004		1.09	mg/L	109	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	1.004	U	.82	mg/L	82	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	1.004	U	.81	mg/L	81	75	125	1	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	2.50375		2.52	mg/L	101	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.3	0.3			
L56331-09SDL	SDL	12/23/19 21:42				U	mg/L					10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	2.50375		2.55	mg/L	102	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.3	0.3			
WG488806													
WG488806ICV	ICV	12/26/19 11:49	II191209-2	5.0075		5.04	mg/L	101	90	110			
WG488806ICB	ICB	12/26/19 11:53				U	mg/L		-0.3	0.3			
WG488806PQV	PQV	12/26/19 11:57	II191223-3	.502		.49	mg/L	98	70	130			
WG488806ICSAB	ICSAB	12/26/19 12:01	II191127-4	5.02		4.89	mg/L	97	80	120			
WG488184PBS	PBS	12/26/19 12:17				U	mg/L		-0.3	0.3			
WG488184LFB1	LFB	12/26/19 12:21	II191204-3	1.004		1.04	mg/L	104	80	120			
L56331-05MS2	MS	12/26/19 12:44	II191204-3	1.004	U	.78	mg/L	78	75	125			
L56331-05MSD2	MSD	12/26/19 12:48	II191204-3	1.004	U	.75	mg/L	75	75	125	4	20	
WG488806CCV1	CCV	12/26/19 12:55	II191204-1	2.50375		2.45	mg/L	98	90	110			
WG488806CCB1	CCB	12/26/19 12:59				U	mg/L		-0.3	0.3			
L56331-06SDL	SDL	12/26/19 13:03			U	U	mg/L					10	
WG488806CCV2	CCV	12/26/19 13:19	II191204-1	2.50375		2.43	mg/L	97	90	110			
WG488806CCB2	CCB	12/26/19 13:23				U	mg/L		-0.3	0.3			
WG488846													
WG488846ICV	ICV	12/26/19 22:07	II191209-2	5.0075		5.12	mg/L	102	90	110			
WG488846ICB	ICB	12/26/19 22:11				U	mg/L		-0.3	0.3			
WG488846PQV	PQV	12/26/19 22:15	II191223-3	.502		.54	mg/L	108	70	130			
WG488846ICSAB	ICSAB	12/26/19 22:18	II191127-4	5.02		4.95	mg/L	99	80	120			
WG488184PBS	PBS	12/26/19 22:34				U	mg/L		-0.3	0.3			
WG488184LFB1	LFB	12/26/19 22:38	II191204-3	1.004		1.06	mg/L	106	80	120			
L56331-05MS2	MS	12/26/19 22:46	II191204-3	1.004	U	.77	mg/L	77	75	125			
L56331-05MSD2	MSD	12/26/19 22:50	II191204-3	1.004	U	.73	mg/L	73	75	125	5	20	MA
L56331-09SDL	SDL	12/26/19 22:58			U	U	mg/L					10	
WG488846CCV	CCV	12/26/19 23:02	II191226-1	2.50375		2.5	mg/L	100	90	110			
WG488846CCB	CCB	12/26/19 23:05				U	mg/L		-0.3	0.3			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Potassium (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	20		19.88	mg/L	99	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.6	0.6			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	1		1.05	mg/L	105	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	25		25.29	mg/L	101	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.6	0.6			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	99.95798		100.8	mg/L	101	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	99.95798	6.9	104.6	mg/L	98	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	99.95798	6.9	105.8	mg/L	99	75	125	1	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	10		9.75	mg/L	98	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.6	0.6			
L56331-09SDL	SDL	12/23/19 21:42			17.1	17.85	mg/L				4	10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	10		9.74	mg/L	97	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.6	0.6			

Residue, Filterable (TDS) @180C (MWMT) SM2540C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489166													
WG489166PBW	PBW	12/31/19 16:13				U	mg/L		-20	20			
WG489166LCSW	LCSW	12/31/19 16:16	PCN59646	1000		1000	mg/L	100	80	120			
WG488184PBS	PBS	12/31/19 16:19				24	mg/L		-40	40			
L56331-04DUP	DUP	12/31/19 16:36			3810	3770	mg/L				1	10	
WG488413PBS	PBS	12/31/19 16:56				U	mg/L		-40	40			

Selenium (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.0516	mg/L	103	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0003	0.0003			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.00025025		.00028	mg/L	112	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.0003	0.0003			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02002		.02044	mg/L	102	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0003	0.0003			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05005		.04901	mg/L	98	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0003	0.0003			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.25		.25702	mg/L	103	90	110			
WG489196CCB1	CCB	01/02/20 12:56				.00015	mg/L		-0.0003	0.0003			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05005	.0192	.0671	mg/L	96	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05005	.0192	.07033	mg/L	102	75	125	5	20	
L56331-06SDL	SDL	01/02/20 13:05			.026	.0252	mg/L				3	10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05005		.04942	mg/L	99	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0003	0.0003			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.25		.23335	mg/L	93	90	110			
WG489196CCB2	CCB	01/02/20 13:17				.00014	mg/L		-0.0003	0.0003			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05005		.04783	mg/L	96	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.25		.24131	mg/L	97	90	110			
WG489196CCB3	CCB	01/02/20 13:37				.00015	mg/L		-0.0003	0.0003			

Wood - E&I Solutions, Inc.

ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Silver (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.02004		.02005	mg/L	100	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0003	0.0003			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.0005015		.00046	mg/L	92	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.0005	0.0005			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.01002		.00961	mg/L	96	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0003	0.0003			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.01002		.00996	mg/L	99	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0003	0.0003			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.025075		.02467	mg/L	98	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0003	0.0003			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.01002	U	.00889	mg/L	89	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.01002	U	.00912	mg/L	91	75	125	3	20	
L56331-06SDL	SDL	01/02/20 13:05			U	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.01002		.00986	mg/L	98	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0003	0.0003			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.025075		.02386	mg/L	95	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0003	0.0003			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.01002		.00974	mg/L	97	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.025075		.02405	mg/L	96	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0003	0.0003			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Sodium (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	100		99.29	mg/L	99	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.6	0.6			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.999		1.07	mg/L	107	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	24.975		25.28	mg/L	101	80	120			
WG488184PBS	PBS	12/23/19 20:44				1.64	mg/L		-0.6	0.6			BA
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	100.0046		101.6	mg/L	102	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	100.0046	24.7	122.7	mg/L	98	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	100.0046	24.7	124	mg/L	99	75	125	1	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	50		48.47	mg/L	97	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.6	0.6			
L56331-09SDL	SDL	12/23/19 21:42			36.1	36.5	mg/L				1	10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	50		48.37	mg/L	97	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.6	0.6			
WG488806													
WG488806ICV	ICV	12/26/19 11:49	II191209-2	100		99.67	mg/L	100	90	110			
WG488806ICB	ICB	12/26/19 11:53				U	mg/L		-0.6	0.6			
WG488806PQV	PQV	12/26/19 11:57	II191223-3	.999		1.05	mg/L	105	70	130			
WG488806ICSAB	ICSAB	12/26/19 12:01	II191127-4	24.975		25.14	mg/L	101	80	120			
WG488184PBS	PBS	12/26/19 12:17				1.67	mg/L		-0.6	0.6			B1
WG488184LFB1	LFB	12/26/19 12:21	II191204-3	100.0046		99.29	mg/L	99	80	120			
L56331-05MS2	MS	12/26/19 12:44	II191204-3	100.0046	24.2	120.6	mg/L	96	75	125			
L56331-05MSD2	MSD	12/26/19 12:48	II191204-3	100.0046	24.2	121.7	mg/L	97	75	125	1	20	
WG488806CCV1	CCV	12/26/19 12:55	II191204-1	50		48.78	mg/L	98	90	110			
WG488806CCB1	CCB	12/26/19 12:59				U	mg/L		-0.6	0.6			
L56331-06SDL	SDL	12/26/19 13:03			61.6	63.5	mg/L				3	10	
WG488806CCV2	CCV	12/26/19 13:19	II191204-1	50		47.96	mg/L	96	90	110			
WG488806CCB2	CCB	12/26/19 13:23				U	mg/L		-0.6	0.6			

Strontium (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	2		1.988	mg/L	99	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.027	0.027			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.045135		.0494	mg/L	109	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	.5015		.4885	mg/L	97	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.027	0.027			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	.5015		.5143	mg/L	103	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	.5015	.965	1.446	mg/L	96	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	.5015	.965	1.468	mg/L	100	75	125	2	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	1		.9729	mg/L	97	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.027	0.027			
L56331-09SDL	SDL	12/23/19 21:42			1.19	1.267	mg/L				6	10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	1		.9742	mg/L	97	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.027	0.027			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Sulfate (MWMT) D516-07 - Turbidimetric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489857													
WG489857ICB	ICB	01/14/20 10:38				U	mg/L		-3	3			
WG489857ICV	ICV	01/14/20 10:38	WI200102-2	20		20.1	mg/L	101	90	110			
WG489857CCV1	CCV	01/14/20 10:56	WI200102-1	25.025		24	mg/L	96	90	110			
WG489857CCB1	CCB	01/14/20 10:56				U	mg/L		-3	3			
WG488184PBS	PBS	01/14/20 10:56				U	mg/L		-3	3			
WG489857CCV2	CCV	01/14/20 10:57	WI200102-1	25.025		25.6	mg/L	102	90	110			
WG489857CCB2	CCB	01/14/20 10:57				U	mg/L		-3	3			
WG489857CCV3	CCV	01/14/20 11:15	WI200102-1	25.025		25.5	mg/L	102	90	110			
WG489857CCB3	CCB	01/14/20 11:15				U	mg/L		-3	3			
WG489857CCV4	CCV	01/14/20 11:17	WI200102-1	25.025		26.2	mg/L	105	90	110			
WG489857CCB4	CCB	01/14/20 11:17				U	mg/L		-3	3			
WG489857CCV5	CCV	01/14/20 11:30	WI200102-1	25.025		24.1	mg/L	96	90	110			
WG489857CCB5	CCB	01/14/20 11:30				U	mg/L		-3	3			
L56331-01DUP	DUP	01/14/20 11:30			2920	3170	mg/L				8	20	
L56331-02AS	AS	01/14/20 11:32	SO4TURB	10.0000008	2160	2150	mg/L	-100	90	110			M3
WG489857CCV6	CCV	01/14/20 11:32	WI200102-1	25.025		25.2	mg/L	101	90	110			
WG489857CCB6	CCB	01/14/20 11:32				U	mg/L		-3	3			
WG489857CCV7	CCV	01/14/20 11:33	WI200102-1	25.025		23.8	mg/L	95	90	110			
WG489857CCB7	CCB	01/14/20 11:33				U	mg/L		-3	3			
WG489857LFB	LFB	01/14/20 11:35	WI190801-3	10.01		10.5	mg/L	105	90	110			
WG489857CCV8	CCV	01/14/20 11:35	WI200102-1	25.025		25.6	mg/L	102	90	110			
WG489857CCB8	CCB	01/14/20 11:36				U	mg/L		-3	3			

Thallium (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.05181	mg/L	104	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0003	0.0003			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.000501		.0005	mg/L	100	70	130			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02004		.02051	mg/L	102	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0003	0.0003			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.0501		.04728	mg/L	94	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0003	0.0003			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1002		.09827	mg/L	98	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0003	0.0003			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.0501	.0003	.05133	mg/L	102	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.0501	.0003	.05235	mg/L	104	75	125	2	20	
L56331-06SDL	SDL	01/02/20 13:05			U	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.0501		.04606	mg/L	92	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0003	0.0003			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1002		.0947	mg/L	95	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0003	0.0003			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.0501		.04622	mg/L	92	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1002		.09643	mg/L	96	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0003	0.0003			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Thorium (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.0511	mg/L	102	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.003	0.003			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.005		.0045	mg/L	90	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.005	0.005			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.05		.0523	mg/L	105	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.003	0.003			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05		.0477	mg/L	95	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.003	0.003			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1		.0983	mg/L	98	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.003	0.003			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05	U	.0525	mg/L	105	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05	U	.0536	mg/L	107	75	125	2	20	
L56331-06SDL	SDL	01/02/20 13:05			U	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05		.0478	mg/L	96	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.003	0.003			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1		.0948	mg/L	95	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.003	0.003			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05		.0473	mg/L	95	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1		.0973	mg/L	97	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.003	0.003			

Tin (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	2		2.005	mg/L	100	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.12	0.12			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.2004		.217	mg/L	108	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	2.505		2.473	mg/L	99	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.12	0.12			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	1.002		1.059	mg/L	106	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	1.002	U	.944	mg/L	94	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	1.002	U	.938	mg/L	94	75	125	1	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	1		1.013	mg/L	101	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.12	0.12			
L56331-09SDL	SDL	12/23/19 21:42			U	U	mg/L					10	
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	1		1.008	mg/L	101	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.12	0.12			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Titanium (MWMT) M6010D ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG488736													
WG488736ICV	ICV	12/23/19 20:16	II191209-2	2		1.969	mg/L	98	90	110			
WG488736ICB	ICB	12/23/19 20:20				U	mg/L		-0.015	0.015			
WG488736PQV	PQV	12/23/19 20:24	II191202-2	.024925		.026	mg/L	104	70	130			
WG488736ICSAB	ICSAB	12/23/19 20:27	II191127-4	.4985		.508	mg/L	102	80	120			
WG488184PBS	PBS	12/23/19 20:44				U	mg/L		-0.015	0.015			
WG488184LFB1	LFB	12/23/19 20:47	II191204-3	1		1.038	mg/L	104	80	120			
L56331-05MS2	MS	12/23/19 21:11	II191204-3	1	.024	.9742	mg/L	95	75	125			
L56331-05MSD2	MSD	12/23/19 21:15	II191204-3	1	.024	.9773	mg/L	95	75	125	0	20	
WG488736CCV1	CCV	12/23/19 21:22	II191204-1	1		.9959	mg/L	100	90	110			
WG488736CCB1	CCB	12/23/19 21:26				U	mg/L		-0.015	0.015			
L56331-09SDL	SDL	12/23/19 21:42			.033	.0665	mg/L				102	10	ZG
WG488736CCV2	CCV	12/23/19 21:45	II191204-1	1		.9917	mg/L	99	90	110			
WG488736CCB2	CCB	12/23/19 21:49				U	mg/L		-0.015	0.015			

Uranium (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.0514	mg/L	103	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0003	0.0003			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.0005		.00049	mg/L	98	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.0005	0.0005			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02		.0215	mg/L	108	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0003	0.0003			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05		.04687	mg/L	94	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0003	0.0003			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1		.0983	mg/L	98	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0003	0.0003			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05	.0505	.1007	mg/L	100	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05	.0505	.10232	mg/L	104	75	125	2	20	
L56331-06SDL	SDL	01/02/20 13:05			.1034	.10185	mg/L				1	10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05		.04677	mg/L	94	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0003	0.0003			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1		.0956	mg/L	96	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0003	0.0003			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05		.04658	mg/L	93	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1		.09759	mg/L	98	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0003	0.0003			

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Vanadium (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.05043	mg/L	101	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.0015	0.0015			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.002		.00203	mg/L	102	70	130			
WG489196ICSA	ICSA	01/02/20 12:29				U	mg/L		-0.002	0.002			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02		.02044	mg/L	102	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.0015	0.0015			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.05		.04812	mg/L	96	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.0015	0.0015			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.1		.10183	mg/L	102	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.0015	0.0015			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.05	U	.0462	mg/L	92	75	125			
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.05	U	.0486	mg/L	97	75	125	5	20	
L56331-06SDL	SDL	01/02/20 13:05			U	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.05		.04799	mg/L	96	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.0015	0.0015			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.1		.09373	mg/L	94	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.0015	0.0015			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.05		.04737	mg/L	95	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.1		.09727	mg/L	97	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.0015	0.0015			

Zinc (MWMT) M6020B ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG489196													
WG489196ICV	ICV	01/02/20 12:24	MS191231-8	.05		.0499	mg/L	100	90	110			
WG489196ICB	ICB	01/02/20 12:25				U	mg/L		-0.012	0.012			
WG489196PQV	PQV	01/02/20 12:27	MS191231-5	.010015		.0098	mg/L	98	70	130			
WG489196ICSAB	ICSAB	01/02/20 12:31	MS191119-7	.02003		.0217	mg/L	108	80	120			
WG488413PBS	PBS	01/02/20 12:36				U	mg/L		-0.012	0.012			
WG488413LFB2	LFB	01/02/20 12:43	MS191119-5	.050075		.0487	mg/L	97	80	120			
WG488184PBS	PBS	01/02/20 12:45				U	mg/L		-0.012	0.012			
WG489196CCV1	CCV	01/02/20 12:54	MS191231-2	.50075		.4953	mg/L	99	90	110			
WG489196CCB1	CCB	01/02/20 12:56				U	mg/L		-0.012	0.012			
L56331-05MS1	MS	01/02/20 12:59	MS191119-5	.050075	.503	.5397	mg/L	73	75	125			M3
L56331-05MSD1	MSD	01/02/20 13:01	MS191119-5	.050075	.503	.5499	mg/L	94	75	125	2	20	
L56331-06SDL	SDL	01/02/20 13:05			U	U	mg/L					10	
WG488184LFB2	LFB	01/02/20 13:12	MS191119-5	.050075		.0483	mg/L	96	80	120			
WG488496PBS	PBS	01/02/20 13:14				U	mg/L		-0.012	0.012			
WG489196CCV2	CCV	01/02/20 13:15	MS191231-2	.50075		.485	mg/L	97	90	110			
WG489196CCB2	CCB	01/02/20 13:17				U	mg/L		-0.012	0.012			
WG488496LFB2	LFB	01/02/20 13:33	MS191119-5	.050075		.0478	mg/L	95	80	120			
WG489196CCV3	CCV	01/02/20 13:35	MS191231-2	.50075		.4902	mg/L	98	90	110			
WG489196CCB3	CCB	01/02/20 13:37				U	mg/L		-0.012	0.012			

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB32_0.5-3
Locator:

ACZ Sample ID: ***L56331-01***
Date Sampled: *11/25/19 13:40*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Radium 226 (MWMT) Prep Method:
M903.1

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226 (MWMT)	12/30/19 0:02			0.9 ✓	0.34 ✓	0.31	pCi/L	*	djc

Radium 228 (MWMT) Prep Method:
M9320

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228 (MWMT)	01/07/20 14:54		U 9	2.2	2.5	6.1	pCi/L	*	amk

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB32_6-15
Locator:

ACZ Sample ID: ***L56331-02***
Date Sampled: *11/25/19 14:06*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Radium 226 (MWMT) Prep Method:
M903.1

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226 (MWMT)	12/30/19 0:04			0.71	0.41	0.37	pCi/L	*	djc

Radium 228 (MWMT) Prep Method:
M9320

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228 (MWMT)	01/07/20 14:54		U 9	✓ 4.9	2.4 ✓	5.8	pCi/L	*	amk

REPRC.02.06.05.01 ** Please refer to Qualifier Reports for details.*

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RadioChemistry Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB34_0.5-3
Locator:

ACZ Sample ID: ***L56331-03***
Date Sampled: *11/25/19 15:05*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Radium 226 (MWMT) Prep Method:
M903.1

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226 (MWMT)	12/30/19 0:05			1.2 ✓	0.39 ✓	0.4	pCi/L	*	djc

Radium 228 (MWMT) Prep Method:
M9320

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228 (MWMT)	01/07/20 14:54		U 9	3.1	2.8	6.6	pCi/L	*	amk

REPRC.02.06.05.01 ** Please refer to Qualifier Reports for details.*

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB34_6-15
Locator:

ACZ Sample ID: ***L56331-04***
Date Sampled: *11/25/19 15:28*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Radium 226 (MWMT) Prep Method:
M903.1

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226 (MWMT)	12/30/19 0:07			1.6	0.36	0.42	pCi/L	*	djc

Radium 228 (MWMT) Prep Method:
M9320

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228 (MWMT)	01/07/20 14:54		U 9	4.8✓	2.8 ✓	5.7	pCi/L	*	amk

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33_0.5-3
Locator:

ACZ Sample ID: ***L56331-05***
Date Sampled: *12/03/19 12:40*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Radium 226 (MWMT) Prep Method:
M903.1

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226 (MWMT)	12/30/19 0:08			1.2 ✓	0.42	0.5	pCi/L	*	djc

Radium 228 (MWMT) Prep Method:
M9320

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228 (MWMT)	01/07/20 14:54		U 9	0.64	2.1	5.1	pCi/L	*	amk

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33_6-15
Locator:

ACZ Sample ID: ***L56331-06***
Date Sampled: *12/03/19 13:05*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Radium 226 (MWMT) Prep Method:
M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226 (MWMT)	12/30/19 0:10		1.2	0.31	0.1	pCi/L	*	djc

Radium 228 (MWMT) Prep Method:
M9320

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228 (MWMT)	01/07/20 14:54		U 9	-0.07	2.4	6.4	pCi/L	*	amk

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB33-FD_0.5-3
Locator: Field Duplicate of STSB33_0.5-3

ACZ Sample ID: ***L56331-07***
Date Sampled: *12/03/19 12:48*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Radium 226 (MWMT) Prep Method:
M903.1

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226 (MWMT)	12/30/19 0:11			0.79 ✓	0.36 ✓	0.36	pCi/L	*	djc

Radium 228 (MWMT) Prep Method:
M9320

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228 (MWMT)	01/07/20 14:54		U 9	3	2.4	5.9	pCi/L	*	amk

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RadioChemistry Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB35_0.5-3
Locator:

ACZ Sample ID: ***L56331-08***
Date Sampled: *12/03/19 14:41*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Radium 226 (MWMT) Prep Method:
M903.1

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226 (MWMT)	12/30/19 0:12			1.4	0.4	0.32	pCi/L	*	djc

Radium 228 (MWMT) Prep Method:
M9320

Parameter	Measure Date	Prep Date		Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228 (MWMT)	01/07/20 14:54		U 9	1.8	2.5	5.8	pCi/L	*	amk

REPRC.02.06.05.01 ** Please refer to Qualifier Reports for details.*

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RadioChemistry Analytical Results

Wood - E&I Solutions, Inc.
Project ID:
Sample ID: STSB35_6-15
Locator:

ACZ Sample ID: ***L56331-09***
Date Sampled: *12/03/19 15:00*
Date Received: *12/09/19*
Sample Matrix: *Soil*

Radium 226 (MWMT) Prep Method:
M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226 (MWMT)	12/30/19 0:14		1.1 ✓	0.35 ✓	0.32	pCi/L	*	djc

Radium 228 (MWMT) Prep Method:
M9320

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228 (MWMT)	01/07/20 14:54		-0.5 U 9	2.1	5.9	pCi/L	*	amk

REPRC.02.06.05.01 ** Please refer to Qualifier Reports for details.*

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Error(+/-)	Calculated sample specific uncertainty
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
LCL	Lower Control Limit, in % (except for LCSS, mg/Kg)
LLD	Calculated sample specific Lower Limit of Detection
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RER	Relative Error Ratio, calculation used for Dup. QC taking into account the error factor.
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
UCL	Upper Control Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

DUP	Sample Duplicate	*MS/MSD*	Matrix Spike/Matrix Spike Duplicate
LCSS	Laboratory Control Sample - Soil	*PBS*	Prep Blank - Soil
LCSW	Laboratory Control Sample - Water	*PBW*	Prep Blank - Water

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Matrix Spikes	Determines sample matrix interferences, if any.

ACZ Qualifiers (Qual)

H	Analysis exceeded method hold time.

Method Prefix Reference

M	EPA methodology, including those under SDWA, CWA, and RCRA
SM	Standard Methods for the Examination of Water and Wastewater.
D	ASTM
RP	DOE
ESM	DOE/ESM

Comments

(1) Solid matrices are reported on a dry weight basis.

(2) Preparation method: "Method" indicates preparation defined in analytical method.

(3) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.

(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click:

https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

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Radiochemistry QC Summary

Wood - E&I Solutions, Inc.

ACZ Project ID: ***L56331***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Radium 226 (MWMT) M903.1 **Units:** pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found		Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
WG488622																	
WG488184PBW	PBW	12/30/19						.09	U	0.29	0.54			1.08			
WG488184LCSW	LCSW	12/30/19	PCN57864	66.67				62		2.2	0.5	93	43	148			
L56331-01DUP	DUP-RPD	12/30/19			0.9	0.34	0.31	1.3		0.36	0.23				36	20	RG
L56331-01DUP	DUP-RER	12/30/19			0.9	0.34	0.31	1.3		0.36	0.23				0.81	2	
L56331-02MS	MS	12/30/19	PCN57864	66.67	0.71	0.41	0.37	63		1.8	0.27	93	43	148			

Radium 228 (MWMT) M9320 **Units:** pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found		Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
WG488867																	
WG488184PBW	PBW	01/07/20						2.1	U	2	5.1			10.2			
WG488184LCSW	LCSW	01/07/20	PCN57186	33.85				32		3.9	6.4	95	47	123			
L56331-02MS	MS	01/07/20	PCN57186	28.21	4.9	2.4	5.8	32		3.6	5.6	96	47	123			
L56331-01DUP	DUP-RPD	01/07/20			2.2	2.5	6.1	2.1		2.4	5.7				5	20	

Wood - E&I Solutions, Inc. ACZ Project ID: ***L56331***

Metals Analysis

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Thorium (MWMT)	M6020B ICP-MS

Radiochemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Radium 226 (MWMT)	M903.1
Radium 228 (MWMT)	M9320

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Bicarbonate as CaCO3	SM2320B - Titration
Carbonate as CaCO3	SM2320B - Titration
Chloride (MWMT)	SM4500Cl-E
Cyanide, WAD (MWMT)	SM4500-CN I,E-Colorimetric w/ distillation
Fluoride (MWMT)	SM4500F-C
Hydroxide as CaCO3	SM2320B - Titration
Nitrate/Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction
Nitrite as N (MWMT)	M353.2 - Automated Cadmium Reduction
Nitrogen, total Kjeldahl (MWMT)	M351.2 - Block Digestor
Residue, Filterable (TDS) @180C (MWMT)	SM2540C
Sulfate (MWMT)	D516-07 - Turbidimetric
Total Alkalinity	SM2320B - Titration

L56331-2006231417

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 18:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE	AS REC		12/18/19 6:51		10.08		10.08	10.08							20.1
2	WG488184CSTD2	NONE	AS REC		12/18/19 8:27		7.02		7.02	7.02							20.3
3	WG488184CSTD3	NONE	AS REC		12/18/19 10:02		2.07		2.07	2.07							20.3
4	WG488184ICV	PCN58503	AS REC		12/18/19 11:38		3.97		3.97	3.97							20.1
5	WG488184PBS	NONE	AS REC		12/18/19 17:59		4.89		6.18	6.21	0	5002.4		12/17/2019 8:45:00 AM	12/18/2019 10:20:00 AM	25.58333333326	19
6	L56331-01	STSB32_0.5-3	AS REC		12/17/19 7:00	0	4.89	23	4.16	4.2	5000	5017	11.3	12/17/2019 8:45:00 AM	12/18/2019 1:30:00 PM	28.74999999994	19.3
7	L56331-02	STSB32_6-15	AS REC		12/17/19 8:35	0	4.89	23	5.33	5.48	5000	5000.7	20.37	12/17/2019 8:45:00 AM	12/18/2019 2:00:00 PM	29.25	19.9
8	L56331-03	STSB34_0.5-3	AS REC		12/17/19 10:10	0	4.89	23	4.94	4.9	5000	5003	10.64	12/17/2019 8:45:00 AM	12/18/2019 1:34:00 PM	28.81666666665	19.9
9	L56331-04	STSB34_6-15	AS REC		12/17/19 11:46	0	4.89	23	5.26	5.38	5000	5003.4	19.98	12/17/2019 8:45:00 AM	12/18/2019 1:35:00 PM	28.8333333332	19.8
10	L56331-05	STSB33_0.5-3	AS REC		12/17/19 13:21	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
11	L56331-05MS1	MS191119-5	AS REC		12/17/19 14:57	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
12	L56331-05MSD1	MS191119-5	AS REC		12/17/19 18:08	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
13	L56331-05MS2	II191204-3	AS REC		12/17/19 16:32	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
14	L56331-05MSD2	II191204-3	AS REC		12/17/19 19:43	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
15	WG488184CCV1	PCN58503	AS REC		12/18/19 3:40		4.06		4.07	4.08							19.8
16	L56331-06	STSB33_6-15	AS REC		12/17/19 21:19	0	4.89	23	7.07	7.34	5000	5009.7	21.6	12/17/2019 8:45:00 AM	12/18/2019 4:00:00 PM	31.24999999988	19.2
17	L56331-07	STSB33-FD_0.5-3	AS REC		12/17/19 22:54	0	4.89	23	4.28	4.34	5000	5000.3	16.22	12/17/2019 8:45:00 AM	12/18/2019 2:25:00 PM	29.66666666663	19.2
18	L56331-08	STSB35_0.5-3	AS REC		12/18/19 0:29	0	4.89	23	4.25	4.21	5000	5000	11.69	12/17/2019 8:45:00 AM	12/18/2019 2:15:00 PM	29.49999999994	19.2
19	L56331-09	STSB35_6-15	AS REC		12/18/19 2:05	0	4.89	23	3.87	3.8	5000	5004.4	11.16	12/17/2019 8:45:00 AM	12/18/2019 2:15:00 PM	29.49999999994	19.4
20	WG488184ICV1		AS REC		12/18/19 13:13		3.97		3.97	3.97							20.1
20	WG488184LFB1	II191204-3	AS REC		12/18/19 14:49	0	4.89	23	6.18	6.21	0	5002.4		12/17/2019 8:45:00 AM	12/18/2019 10:20:00 AM	25.58333333326	19
21	WG488184LFB2	MS191119-5	AS REC		12/18/19 16:24	0	4.89	23	6.18	6.21	0	5002.4		12/17/2019 8:45:00 AM	12/18/2019 10:20:00 AM	25.58333333326	19

Report Comments: _____

Internal Comments _____

AREV: GKH 12/23/19
Initials, Date

SREV: _____
Initials, Date

12/23/2019 8:44:05 AM 10120

L56331-2006231417

Meteoric Water Mobility

WG488184

ACZ Laboratories, Inc

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 18:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
22	WG488184CCV2	PCN58503	AS REC		12/18/19 5:16		4.03		4.07	4.02							19.7

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MS2	ICP Spike
L56331-05MSD1	ICPMS Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184CCV1	pH QC
WG488184CCV2	pH QC
WG488184CSTD1	pH QC
WG488184CSTD2	pH QC
WG488184CSTD3	pH QC
WG488184ICV	pH QC
WG488184ICV1	WG488184ICV1
WG488184LFB1	ICP LFB
WG488184LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/23/2019 8:44:05 AM 10120

ACZ Laboratories, Inc.
Geochemistry Department
Data Review and Reagents

Data Reviewer: GKH
Date: 12/19/19

Approved: CRA
Date: 12-20-19

Analyst: GKH

Workgroup: WG488184

Analysis Date: 12/17/19 - 12/18/19

Sample type used: SO

Extraction / Digestion / Analysis / Prep / Calc:

	Yes	No	N/A
1. Is the raw data checked to the computer printout for transcription errors?	✓		
2. Is the %solid or TS attached for dilution factors?			✓
3. Were proper volumes of reagents used per final volume?			✓
4. Was the proper sub-sample used (as received, client prep,<2000, <500, <250, dry, R&P, RPLL)?	✓		
5.Were the dilution factor calculation checked (final volume, weight, %solid)?			✓
6. Did the RPD pass?			✓
7. Does all the spike information correlate with each other?	✓		
8. Is the appropriate spike in the computer-designated line?	✓		
9. Are all errors properly corrected (single-line crossout, dated & initialed)?	✓		
10. Is the standard/reagent information complete and current?	✓		
11. Is your instrument calibration passing (and included in the data package if needed)?	✓		
FOR SREV: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?			

Standard/Reagent/Equipment*	PCN/SCN/LOT #*	Expiration Date
BUFFER 10	59339	3/31/21
7	58542	12/31/20
2	58293	12/31/20

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

Comments:

METEORIC WATER MOBILITY TEST

ACZ Laboratories, Inc.
2773 Downhill Drive
Steamboat Springs, CO 80487

Analyst: **GKH**
Date:
Start Time: **12/17/19 7a**
End Time: **12/18/19 6p**

Workgroup Number:

Loaded Sample Wet Weight

Sx Number	Sx Wet Weight (g)
L56331-01	5238
L56331-02	5700
L56331-03	5253
L56331-04	6092
L56331-05	5341
L56331-06	5492
L56331-07	5249
L56331-08	5225
L56331-09	5382

H2O rate start: 3.5 mL/Min
H2O rate finish: 3.5mL/Min

Filter Type/pore size: 0.45 um Filter
Special Comments:

Dry Weight Calculations

Sx Number	Sx Weight (g) (From above)	(x)	% Solid	=	Dry Sx Weight (g)	+	Cubetainer Weight (g)	=	Target Leachate & Cubtainer Wt (g)
L56331-01	5238	x	0.954742967	=	5000.943659	+	137	=	5137.94366
L56331-02	5700	x	0.877305405	=	5000.640807	+	139.4	=	5140.04081
L56331-03	5253	x	0.951968179	=	5000.688844	+	136	=	5136.68884
L56331-04	6092	x	0.820752165	=	5000.022186	+	138.2	=	5138.22219
L56331-05	5341	x	0.936314337	=	5000.854872	+	140.5	=	5141.35487
L56331-06	5492	x	0.910436387	=	5000.116637	+	136	=	5136.11664
L56331-07	5249	x	0.952600056	=	5000.197691	+	139.5	=	5139.69769
L56331-08	5225	x	0.956940692	=	5000.015115	+	139.9	=	5139.91512
L56331-09	5382	x	0.929147599	=	5000.67238	+	139.3	=	5139.97238

Final Leachate Weight

Sx Number	Actual Leachate & Cubetainer	-	Cubetainer Wt (g)	=	Final Leachate Volume (mL)
L56331-01	5154	-	137	=	5017
L56331-02	5140.1	-	139.4	=	5000.7
L56331-03	5139	-	136	=	5003
L56331-04	5141.6	-	138.2	=	5003.4
L56331-05	5162.5	-	140.5	=	5022
L56331-06	5145.7	-	136	=	5009.7
L56331-07	5139.8	-	139.5	=	5000.3
L56331-08	5139.9	-	139.9	=	5000
L56331-09	5143.7	-	139.3	=	5004.4

Comments:

METEORIC WATER MOBILITY TEST

ACZ Laboratories, Inc.
2773 Downhill Drive
Steamboat Springs, CO 80487

Analyst: **GKH**
Date:
Start Time: 12/17/19 7a
End Time: 12/18/19 6p

Workgroup Number: WG488184

Feed Moisture

Sx Number	Pan Weight (g)	Wet Sx + Pan Weight (g)	Dry Sx + Pan Weight (g)	% Solid	% Feed Moisture
L56331-01	137.29	680.41	655.83	95.47429666	4.525703344
L56331-02	160.91	660.28	599.01	87.73054048	12.26945952
L56331-03	151.39	684.37	658.77	95.19681789	4.803182108
L56331-04	141.59	659.03	566.28	82.07521645	17.92478355
L56331-05	150.66	661.45	628.92	93.63143366	6.368566338
L56331-06	153.38	652.02	607.36	91.0436387	8.956361303
L56331-07	148.3	652.52	628.62	95.26000555	4.739994447
L56331-08	149.68	678.95	656.16	95.69406919	4.30593081
L56331-09	149.79	665.51	628.97	92.91475995	7.085240053

Screening-Particle Size

Sx Number	Sx Weight (g)	Sx > 5 cm (g)	Sx < 5 cm (g)	%Sx > 5cm	%Sx < 5cm
L56331-01			0	#DIV/0!	#DIV/0!
L56331-02			0	#DIV/0!	#DIV/0!
L56331-03			0	#DIV/0!	#DIV/0!
L56331-04			0	#DIV/0!	#DIV/0!
L56331-05			0	#DIV/0!	#DIV/0!
L56331-06			0	#DIV/0!	#DIV/0!
L56331-07			0	#DIV/0!	#DIV/0!
L56331-08			0	#DIV/0!	#DIV/0!
L56331-09			0	#DIV/0!	#DIV/0!

Residual Moisture

Sx Number	Pan Weight (g)	Wet Sx + Pan Weight (g)	Dry Sx + Pan Weight (g)	% Solid	% Res. Moisture
L56331-01	148.25	822.01	745.88	88.70072429	11.29927571
L56331-02	144.96	899.18	745.54	79.62928588	20.37071412
L56331-03	149.61	845.91	771.83	89.36090765	10.63909235
L56331-04	153.3	856.48	715.99	80.02076282	19.97923718
L56331-05	146.67	952.87	821.71	83.7310841	16.2689159
L56331-06	151.38	971.68	794.53	78.40424235	21.59575765
L56331-07	149.75	896.72	775.53	83.77578751	16.22421249
L56331-08	151.47	899.01	811.61	88.30831795	11.69168205
L56331-09	145.91	815.17	740.45	88.83543018	11.16456982

Time and Temperature for Residual Moisture:
Sample Description: Sand/ Small aggregates
Centrifuge or pre-filter? N/A
Observation of changes: N/A
Storage Conditions of "as rec" sample: Room

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst:
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE					10.08										20.1
2	WG488184CSTD2	NONE					7.02										20.3
3	WG488184CSTD3	NONE					2.07										20.3
4	WG488184ICV	PCN58503					3.97										20.1
5	WG488184PBS	NONE					4.89		6.18	6.21				8:45	10:20		19.0
6	L56331-01	STSB32_0.5-3							4.16	4.20					13:30		19.3
7	L56331-02	STSB32_6-15							5.33	5.48					14:00		19.9
8	L56331-03	STSB34_0.5-3							4.94	4.90					13:45		19.9
9	L56331-04	STSB34_6-15							5.26	5.38					13:35		19.8
10	L56331-05	STSB33_0.5-3							4.30	4.19					15:20		19.8
11	L56331-05MS1	MS191119-5															
12	L56331-05MSD1	MS191119-5															
13	L56331-05MS2	II191204-3															
14	L56331-05MSD2	II191204-3															
15	WG488184CCV1	PCN58503					4.06		4.07	4.08				—	—		19.8
16	L56331-06	STSB33_6-15					4.89		7.07	7.34				8:45	16:00		19.2
17	L56331-07	STSB33-FD_0.5-3					4.89		4.28	4.34					14:25		19.2
18	L56331-08	STSB35_0.5-3							4.25	4.21					14:15		19.2
19	L56331-09	STSB35_6-15							3.87	3.80					14:15		19.4
20	WG488184LFB1	II191204-3							6.18	6.21					10:20		19.0
21	WG488184LFB2	MS191119-5															
22	WG488184CCV2	PCN58503					4.03		4.07	4.02				—	—		19.7

Report Comments:

Internal Comments

AREV: Initials, Date

SREV: Initials, Date

12/16/2019 10:07:49 AM 10120

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst:
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MS2	ICP Spike
L56331-05MSD1	ICPMS Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184CCV1	pH QC
WG488184CCV2	pH QC
WG488184CSTD1	pH QC
WG488184CSTD2	pH QC
WG488184CSTD3	pH QC
WG488184ICV	pH QC
WG488184LFB1	ICP LFB
WG488184LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/16/2019 10:07:49 AM 10120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488184

Date Reported: 23-Dec-19
Run ID: R1765314
Date Analyzed: 17-Dec-19
ICAL Workgroup:
Instrument ID: SOILSPREP

L56331-01

Tag: **Measured:** 12/17/2019 7:00:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	WMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	WMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	WMT-96	28.75	1		hrs	++					
SREV	LEACHATE VOLUME	WMT-96	5017	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	WMT-96	0	1		%	++					
SREV	POST FILTER PH	WMT-96		1		units	++			4.2		
SREV	PRE FILTER PH	WMT-96		1		units	++			4.16		
SREV	RETAINED MOISTURE	WMT-96		1		%	++			11.3		
SREV	TEMPERATURE	WMT-96	19.3	1		C	++	0.1	0.1			
SREV	TIME IN	WMT-96		1			++					
SREV	TIME OUT	WMT-96		1			++					
SREV	WEIGHT, DRY	WMT-96	5000	1		g	++					

L56331-02

Tag: **Measured:** 12/17/2019 8:35:27 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	WMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	WMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	WMT-96	29.25	1		hrs	++					
SREV	LEACHATE VOLUME	WMT-96	5000.7	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	WMT-96	0	1		%	++					
SREV	POST FILTER PH	WMT-96		1		units	++			5.48		
SREV	PRE FILTER PH	WMT-96		1		units	++			5.33		
SREV	RETAINED MOISTURE	WMT-96		1		%	++			20.37		
SREV	TEMPERATURE	WMT-96	19.9	1		C	++	0.1	0.1			
SREV	TIME IN	WMT-96		1			++					
SREV	TIME OUT	WMT-96		1			++					
SREV	WEIGHT, DRY	WMT-96	5000	1		g	++					

L56331-03

Tag: Measured: 12/17/2019 10:10:54 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	28.81667	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5003	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			4.9		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			4.94		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			10.64		
SREV	TEMPERATURE	ıWMT-96	19.9	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-04

Tag: Measured: 12/17/2019 11:46:21 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	28.83333	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5003.4	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			5.38		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			5.26		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			19.98		
SREV	TEMPERATURE	ıWMT-96	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-05

Tag: Measured: 12/17/2019 1:21:48 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	30.58333	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			4.19		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			4.3		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			16.27		
SREV	TEMPERATURE	ıWMT-96	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-05MS1

Tag:

Measured: 12/17/2019 2:57:15 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333333139	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			4.19		
SREV	PRE FILTER PH	TEXT		1		units	++			4.3		
SREV	RETAINED MOISTURE	TEXT		1		%	++			16.27		
SREV	TEMPERATURE	PREP	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	5000	1		g	++					

L56331-05MS2

Tag:

Measured: 12/17/2019 4:32:42 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333333139	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			4.19		
SREV	PRE FILTER PH	TEXT		1		units	++			4.3		
SREV	RETAINED MOISTURE	TEXT		1		%	++			16.27		
SREV	TEMPERATURE	PREP	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	5000	1		g	++					

L56331-05MSD1

Tag:

Measured: 12/17/2019 6:08:09 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333333139	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			4.19		
SREV	PRE FILTER PH	TEXT		1		units	++			4.3		
SREV	RETAINED MOISTURE	TEXT		1		%	++			16.27		
SREV	TEMPERATURE	PREP	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	5000	1		g	++					

L56331-05MSD2

Tag: Measured: 12/17/2019 7:43:36 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333333139	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			4.19		
SREV	PRE FILTER PH	TEXT		1		units	++			4.3		
SREV	RETAINED MOISTURE	TEXT		1		%	++			16.27		
SREV	TEMPERATURE	PREP	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	5000	1		g	++					

L56331-06

Tag: Measured: 12/17/2019 9:19:03 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	31.25	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5009.7	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			7.34		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			7.07		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			21.6		
SREV	TEMPERATURE	ıWMT-96	19.2	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-07

Tag: Measured: 12/17/2019 10:54:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	29.66667	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5000.3	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			4.34		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			4.28		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			16.22		
SREV	TEMPERATURE	ıWMT-96	19.2	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-08

Tag: Measured: 12/18/2019 12:29:57 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	29.5	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5000	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			4.21		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			4.25		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			11.69		
SREV	TEMPERATURE	ıWMT-96	19.2	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-09

Tag: Measured: 12/18/2019 2:05:24 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	29.5	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5004.4	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			3.8		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			3.87		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			11.16		
SREV	TEMPERATURE	ıWMT-96	19.4	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

WG488184CCV1

Tag: Measured: 12/18/2019 3:40:51 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	NEED			4.06		
SREV	POST FILTER PH	TEXT		1		units	NEED			4.08		
SREV	PRE FILTER PH	TEXT		1		units	NEED			4.07		
SREV	TEMPERATURE	PREP	19.8	1		C	NEED	0.1	0.1			

WG488184CCV2

Tag: Measured: 12/18/2019 5:16:18 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	NEED			4.03		
SREV	POST FILTER PH	TEXT		1		units	NEED			4.02		
SREV	PRE FILTER PH	TEXT		1		units	NEED			4.07		
SREV	TEMPERATURE	PREP	19.7	1		C	NEED	0.1	0.1			

WG488184ICV1

Tag: Measured: 12/18/2019 11:38:06 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	NEED			3.97		
SREV	POST FILTER PH	TEXT		1		units	NEED			3.97		
SREV	PRE FILTER PH	TEXT		1		units	NEED			3.97		
SREV	TEMPERATURE	PREP	20.1	1		C	NEED	0.1	0.1			

WG488184ICV1

Tag: 1 Measured: 12/18/2019 1:13:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	NEED			3.97		
SREV	POST FILTER PH	TEXT		1		units	NEED			3.97		
SREV	PRE FILTER PH	TEXT		1		units	NEED			3.97		
SREV	TEMPERATURE	PREP	20.1	1		C	NEED	0.1	0.1			

WG488184LFB1

Tag: Measured: 12/18/2019 2:49:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333332557	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5002.4	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			6.21		
SREV	PRE FILTER PH	TEXT		1		units	++			6.18		
SREV	TEMPERATURE	PREP	19	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	0	1		g	++					

WG488184LFB2

Tag: Measured: 12/18/2019 4:24:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333332557	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5002.4	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			6.21		
SREV	PRE FILTER PH	TEXT		1		units	++			6.18		
SREV	TEMPERATURE	PREP	19	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	0	1		g	++					

WG488184PBS

Tag: Measured: 12/18/2019 5:59:54 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TIME	PREP	3333332557	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5002.4	1		mL	++					
SREV	POST FILTER PH	TEXT		1		units	++			6.21		
SREV	PRE FILTER PH	TEXT		1		units	++			6.18		
SREV	TEMPERATURE	PREP	19	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	0	1		g	++					

Wood - E&I Solutions, Inc.

Project ID: L56331

Soil Preparation

WG488184 **Meteoric Water Mobility**

Sample	Date	SCN	ACTION TEMPERA	EXTRACTION PH	POST FILTER PH	PRE FILTER PH	ETAINED MOISTUR
L56331-01	12/17/19 07:00		X	X	X	X	X
L56331-02	12/17/19 08:35		X	X	X	X	X
L56331-03	12/17/19 10:10		X	X	X	X	X
L56331-04	12/17/19 11:46		X	X	X	X	X
L56331-05	12/17/19 13:21		X	X	X	X	X
L56331-05MS1	12/17/19 14:57		X	X	X	X	X
L56331-05MS2	12/17/19 16:32		X	X	X	X	X
L56331-05MSD1	12/17/19 18:08		X	X	X	X	X
L56331-05MSD2	12/17/19 19:43		X	X	X	X	X
L56331-06	12/17/19 21:19		X	X	X	X	X
L56331-07	12/17/19 22:54		X	X	X	X	X
L56331-08	12/18/19 00:29		X	X	X	X	X
L56331-09	12/18/19 02:05		X	X	X	X	X
WG488184CCV1	12/18/19 03:40			X	X	X	
WG488184CCV2	12/18/19 05:16			X	X	X	
WG488184ICV1	12/18/19 11:38			X	X	X	
WG488184ICV1	12/18/19 13:13			X	X	X	
WG488184LFB1	12/18/19 14:49		X	X	X	X	
WG488184LFB2	12/18/19 16:24		X	X	X	X	
WG488184PBS	12/18/19 17:59			X	X	X	

L56331-2006231417

ICPMS MWMT

QC List Type: QC-ICPMS-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICPMS-MWMT
QC Ref: MA-ICPMS-T-846
Group ID: MA-G-MS-MWMT
Method Ref: M6020
SOP Ref: SOPII022

WG489196

ACZ Laboratories, Inc

Instrument ID: ICPMS7
Analyst: MFM
ACZ Dept: 33
Create Date: 01/02/2020 10:46
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	AG MS MW MT	AS MS MW MT	BE MS MW MT	CD MS MW MT	CO MS MW MT	CR MS MW MT	CU MS MW MT	MN MS MW MT	MO MS MW MT	NI MS MW MT	PB MS MW MT	SB MS MW MT	SE MS MW MT	TH MS MW MT	TL MS MW MT	U MS MW MT	V MS MW MT	ZN MS MW MT	Dilution
1	WG489196ICV	MS191231-8			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
2	WG489196ICB	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
3	WG489196PQV	MS191231-5			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
4	WG489196ICSA	MS191119-6			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
5	WG489196ICSAB	MS191119-7			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
6	WG489196ULRV	MS191231-3			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
7	WG489196WASH	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
8	WG488413PBS	NONE			1				✓		✓							✓	✓	✓		✓				1
9	**L56452-01**	LPT-1			2		696		✓		✓							✓	✓	✓		✓				2
10	L56452-01MS1	MS191119-5			2				✓		✓							✓	✓	✓		✓				2
11	L56452-01MSD1	MS191119-5			2				✓		✓							✓	✓	✓		✓				2
12	WG488413LFB2	MS191119-5			1				✓		✓							✓	✓	✓		✓				1
13	WG488184PBS	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
14	WG489196CCV1	MS191231-2			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
15	WG489196CCB1	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
16	L56331-01	STSB32_0.5-3			1		4760	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5
17	L56331-02	STSB32_6-15			1		3340	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2
18	L56331-03	STSB34_0.5-3			1		2770	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2
19	L56331-04	STSB34_6-15			1		3770	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2
20	L56331-05	STSB33_0.5-3			1		3360	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2
21	L56331-05MS1	MS191119-5			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2
22	L56331-05MSD1	MS191119-5			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2

MS2xW

Report Comments: Be, Co, Mn, Zn → 45

Internal Comments

AREV: MFM 1/2/20
Initials, Date

SREV: 1-6-20
Initials, Date

1/2/2020 10:47:05 AM 123119

ICPMS MWMT

QC List Type: QC-ICPMS-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICPMS-MWMT
QC Ref: MA-ICPMS-T-846
Group ID: MA-G-MS-MWMT
Method Ref: M6020
SOP Ref: SOPII022

WG489196

ACZ Laboratories, Inc

Instrument ID: ICPMS7
Analyst:
ACZ Dept: 33
Create Date: 01/02/2020 10:46
Start Date/Time:
End Date/Time:

L56331-2006231417

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	AG MS MMW MT	AS MS MMW MT	BE MS MMW MT	CD MS MMW MT	CO MS MMW MT	CR MS MMW MT	CU MS MMW MT	MN MS MMW MT	MO MS MMW MT	NI MS MMW MT	PB MS MMW MT	SB MS MMW MT	SE MS MMW MT	TH MS MMW MT	TL MS MMW MT	U MS MMW MT	V MS MMW MT	ZN MS MMW MT	Dilution
23	L56331-06	STSB33_6-15			1		1100	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
24	L56331-06SDL	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
25	L56331-07	STSB33-FD_0.5-3			1		3320	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2
26	WG489196CCV2	MS191231-2			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
27	WG489196CCB2	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
28	L56331-08	STSB35_0.5-3			1		3350	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2
29	L56331-09	STSB35_6-15			1		4970	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5
30	WG488184LFB2	MS191119-5			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
31	WG488496PBS	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
32	L56453-01	STSB05_0.5-3			1		4210	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5
33	L56453-02	STSB05_6-15			1		3620	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2
34	L56453-03	STSB05_45-55			1		874	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
35	L56453-03MS1	MS191119-5			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
36	L56453-03MSD1	MS191119-5			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
37	L56453-04	STSB05_66-71			1		2190	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2
38	WG489196CCV3	MS191231-2			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
39	WG489196CCB3	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
40	L56453-05	STSB05_76-81			1		1830	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
41	L56453-06	STSB06_0.5-3			1		1780	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
42	WG488496LFB2	MS191119-5			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
43	WG489196CCV4	MS191231-2			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
44	WG489196CCB4	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/2/2020 10:47:08 AM 123119

ICPMS MWMT

QC List Type: QC-ICPMS-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICPMS-MWMT
QC Ref: MA-ICPMS-T-846
Group ID: MA-G-MS-MWMT
Method Ref: M6020
SOP Ref: SOPII022

WG489196

ACZ Laboratories, Inc

Instrument ID: ICPMS7
Analyst:
ACZ Dept: 33
Create Date: 01/02/2020 10:46
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MSD1	ICPMS Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56452-01	SJ(2) || quarantined
L56452-01MS1	ICPMS Spike
L56452-01MSD1	ICPMS Spike
L56453-01	BUCKET ||
L56453-02	BUCKET ||
L56453-03	BUCKET ||
L56453-03MS1	ICPMS Spike
L56453-03MSD1	ICPMS Spike
L56453-04	BUCKET ||
L56453-05	BUCKET ||
L56453-06	BUCKET ||
WG488184LFB2	ICPMS LFB
WG488413LFB2	ICPMS LFB
WG488496LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/2/2020 10:47:08 AM 123119

ACZ Laboratories, Inc.

ICPMS DATA REVIEW CHECKLIST

AREV:	MFM
Date:	1/2/2020
SREV:	RP
Date:	1-6-20

Workgroup:	489196
Sample Type:	MWMT
Analysis Date:	1/2/2020
Analyst:	MFM

	Yes	No	N /A
1) Is the instrument ID on the bench sheet correct?	✓		
2) Has a passing method tune been performed within 24 hours?	✓		
3) Was the low calibration point dropped? If yes, notify PM of change to PQLs.		✓	
4) Is the linear regression ≥ 0.995 for the analytes of interest?	✓		
5) Was the PQV standard analyzed & evaluated for DW samples ? (Fail in LIMS if no DW sxs in WG.)			✓
6) Do the dilution factors on the benchsheet match the sequence in the raw data?	✓		
7) Is any sample analyzed on dilution appropriately "D" qualified (not required for o-cal, EC, TDS)?			✓
8) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?			✓
9) Are the % Recoveries of the internal standards within the method limits?	✓		
10) Are all of the QC critera listed in LIMS within specified limits?		✓	
11) Are all samples requiring re-analysis / re-digestion at REDO / REDX status?	✓		
12) Are all errors properly crossed out (i.e. single-line, dated & initialed)?	✓		
13) Is a current standard/reagent form attached to the workgroup?	✓		
14) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
413PBS	Mn ↑	No sxs
452-01	Se LOW	Redo 5x
331-01	Cu 467000	Redo 1000x
331-02	Cu 52600 Mn 8810	Redo 200x
331-03	Cu 60500	Redo 200x
331-04	Cu 72700 Mn 13800	Redo 200x
331-05	Cu 150000 Mn 4490	Redo 500x
331-07	Cu 141000 Mn 4490	Redo 500x
331-08	Cu 168000	Redo 500x
331-09	Cu 518000	Redo 2000x
-05MS/D	Co, Mn, Ni, Zn ↓ Cu ↓/↑	M3
SDL	As, Cu	ZG

ACZ Laboratories, Inc.

ICPMS DATA REVIEW CHECKLIST

AREV:
Date:

SREV:
Date:

Workgroup:
Sample Type:
Analysis Date:
Analyst:

	Yes	No	N /A
1) Is the instrument ID on the bench sheet correct?			
2) Has a passing method tune been performed within 24 hours?			
3) Was the low calibration point dropped? If yes, notify PM of change to PQLs.			
4) Is the linear regression ≥ 0.995 for the analytes of interest?			
5) Was the PQV standard analyzed & evaluated for DW samples ? (Fail in LIMS if no DW sxs in WG.)			
6) Do the dilution factors on the benchsheet match the sequence in the raw data?			
7) Is any sample analyzed on dilution appropriately "D" qualified (not required for o-cal, EC, TDS)?			
8) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?			
9) Are the % Recoveries of the internal standards within the method limits?			
10) Are all of the QC critera listed in LIMS within specified limits?			
11) Are all samples requiring re-analysis / re-digestion at REDO / REDX status?			
12) Are all errors properly crossed out (i.e. single-line, dated & initialed)?			
13) Is a current standard/reagent form attached to the workgroup?			
14) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?			

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
184LFB	Cu ↑	Redo
496PBS	Cu ↑	Redo
453-01	Cu 463000	Redo 1000x
453-02	Cu 261000	Redo 1000x
453-04	Mn 9570	Redo 100x
453-05	Mn 8180	Redo 50x
-03MS/D	Cu ↓	Redo
ULRV	Ag ↓ Se ↑	OK, no sxs >L5
331-06	Possible Cu carryover	Redo
453-03		

FRMII012.02.08.10

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG489196

Date Reported: 06-Jan-20
Run ID: R1766371
Date Analyzed: 02-Jan-20
ICAL Workgroup:
Instrument ID: ICPMS7

WG489196ICV

Tag:

Measured: 1/2/2020 12:24:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.02044 ✓	1		mg/L	++	0.0004	0.002			
SREV	ANTIMONY	REC	102	1		%	++	0.0004	0.002			
SREV	ARSENIC	FOUND	0.05025	1		mg/L	++	0.0002	0.001			
SREV	ARSENIC	REC	101	1		%	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND	0.048364	1		mg/L	++	0.00008	0.0003			
SREV	BERYLLIUM	REC	97	1		%	++	0.00008	0.0003			
SREV	CADMIUM	FOUND	0.049494	1		mg/L	++	0.00005	0.0003			
SREV	CADMIUM	REC	99	1		%	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND	0.05209	1		mg/L	++	0.0005	0.002			
SREV	CHROMIUM	REC	104	1		%	++	0.0005	0.002			
SREV	COBALT	FOUND	0.052623	1		mg/L	++	0.00005	0.0003			
SREV	COBALT	REC	105	1		%	++	0.00005	0.0003			
SREV	COPPER	FOUND	0.04963	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	99	1		%	++	0.0008	0.002			
SREV	LEAD	FOUND	0.05082	1		mg/L	++	0.0001	0.0005			
SREV	LEAD	REC	102	1		%	++	0.0001	0.0005			
SREV	MANGANESE	FOUND	0.05104	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	102	1		%	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND	0.01884	1		mg/L	++	0.0002	0.0005			
SREV	MOLYBDENUM	REC	95	1		%	++	0.0002	0.0005			
SREV	NICKEL	FOUND	0.05176	1		mg/L	++	0.0004	0.001			
SREV	NICKEL	REC	104	1		%	++	0.0004	0.001			
SREV	SELENIUM	FOUND	0.0516	1		mg/L	++	0.0001	0.0003			
SREV	SELENIUM	REC	103	1		%	++	0.0001	0.0003			
SREV	SILVER	FOUND	0.02005	1		mg/L	++	0.0001	0.0005			
SREV	SILVER	REC	100	1		%	++	0.0001	0.0005			
SREV	THALLIUM	FOUND	0.05181	1		mg/L	++	0.0001	0.0005			
SREV	THALLIUM	REC	104	1		%	++	0.0001	0.0005			
SREV	THORIUM	FOUND	0.0511	1		mg/L	++	0.001	0.005			
SREV	THORIUM	REC	102	1		%	++	0.001	0.005			
SREV	URANIUM	FOUND	0.0514	1		mg/L	++	0.0001	0.0005			
SREV	URANIUM	REC	103	1		%	++	0.0001	0.0005			
SREV	VANADIUM	FOUND	0.05043	1		mg/L	++	0.0005	0.002			
SREV	VANADIUM	REC	101	1		%	++	0.0005	0.002			
SREV	ZINC	FOUND	0.0499 ✓	1		mg/L	++	0.004	0.01			
SREV	ZINC	REC	100	1		%	++	0.004	0.01			

WG489196ICB

Tag:

Measured: 1/2/2020 12:25:58 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	ARSENIC	FOUND		1	U	mg/L	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND		1	U	mg/L	++	0.00008	0.0003			
SREV	CADMIUM	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	COBALT	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	LEAD	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND		1	U	mg/L	++	0.0002	0.0005			
SREV	NICKEL	FOUND		1	U	mg/L	++	0.0004	0.001			
SREV	SELENIUM	FOUND		1	U	mg/L	++	0.0001	0.0003			
SREV	SILVER	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THALLIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THORIUM	FOUND		1	U	mg/L	++	0.001	0.005			
SREV	URANIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	VANADIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	ZINC	FOUND		1	U	mg/L	++	0.004	0.01			

WG489196PQV

Tag:

Measured: 1/2/2020 12:27:43 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.00208	1		mg/L	++	0.0004	0.002			
SREV	ANTIMONY	REC	104	1		%	++	0.0004	0.002			
SREV	ARSENIC	FOUND	0.00109	1		mg/L	++	0.0002	0.001			
SREV	ARSENIC	REC	109	1		%	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND	0.000251	1	B	mg/L	++	0.00008	0.0003			
SREV	BERYLLIUM	REC	100	1	B	%	++	0.00008	0.0003			
SREV	CADMIUM	FOUND	0.000254	1	B	mg/L	++	0.00005	0.0003			
SREV	CADMIUM	REC	101	1	B	%	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND	0.00198	1	B	mg/L	++	0.0005	0.002			
SREV	CHROMIUM	REC	99	1	B	%	++	0.0005	0.002			
SREV	COBALT	FOUND	0.000241	1	B	mg/L	++	0.00005	0.0003			
SREV	COBALT	REC	96	1	B	%	++	0.00005	0.0003			
SREV	COPPER	FOUND	0.0019	1	B	mg/L	++	0.0008	0.002			
SREV	COPPER	REC	95	1	B	%	++	0.0008	0.002			
SREV	LEAD	FOUND	0.00049	1	B	mg/L	++	0.0001	0.0005			
SREV	LEAD	REC	98	1	B	%	++	0.0001	0.0005			
SREV	MANGANESE	FOUND	0.00195	1	B	mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	97	1	B	%	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND	0.00047	1	B	mg/L	++	0.0002	0.0005			
SREV	MOLYBDENUM	REC	94	1	B	%	++	0.0002	0.0005			
SREV	NICKEL	FOUND	0.00101	1		mg/L	++	0.0004	0.001			
SREV	NICKEL	REC	101	1		%	++	0.0004	0.001			
SREV	SELENIUM	FOUND	0.00028	1	B	mg/L	++	0.0001	0.0003			
SREV	SELENIUM	REC	112	1	B	%	++	0.0001	0.0003			
SREV	SILVER	FOUND	0.00046	1	B	mg/L	++	0.0001	0.0005			
SREV	SILVER	REC	92	1	B	%	++	0.0001	0.0005			
SREV	THALLIUM	FOUND	0.0005	1		mg/L	++	0.0001	0.0005			
SREV	THALLIUM	REC	100	1		%	++	0.0001	0.0005			
SREV	THORIUM	FOUND	0.0045	1	B	mg/L	++	0.001	0.005			
SREV	THORIUM	REC	90	1	B	%	++	0.001	0.005			
SREV	URANIUM	FOUND	0.00049	1	B	mg/L	++	0.0001	0.0005			
SREV	URANIUM	REC	98	1	B	%	++	0.0001	0.0005			
SREV	VANADIUM	FOUND	0.00203	1		mg/L	++	0.0005	0.002			
SREV	VANADIUM	REC	102	1		%	++	0.0005	0.002			
SREV	ZINC	FOUND	0.0098	1	B	mg/L	++	0.004	0.01			
SREV	ZINC	REC	98	1	B	%	++	0.004	0.01			

WG489196ICSA

Tag:

Measured: 1/2/2020 12:29:29 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	ARSENIC	FOUND		1	U	mg/L	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND		1	U	mg/L	++	0.00008	0.0003			
SREV	CADMIUM	FOUND	0.000183	1	B	mg/L	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.00095	1	B	mg/L	++	0.0004	0.002			
SREV	NICKEL	FOUND		1	U	mg/L	++	0.0004	0.001			
SREV	SELENIUM	FOUND		1	U	mg/L	++	0.0001	0.0003			
SREV	SILVER	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THORIUM	FOUND		1	U	mg/L	++	0.001	0.005			
SREV	URANIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	VANADIUM	FOUND		1	U	mg/L	++	0.0005	0.002			

WG489196ICSAB

Tag:

Measured: 1/2/2020 12:31:17 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.01116	1		mg/L	++	0.0004	0.002			
SREV	ANTIMONY	REC	112	1		%	++	0.0004	0.002			
SREV	ARSENIC	FOUND	0.02048	1		mg/L	++	0.0002	0.001			
SREV	ARSENIC	REC	102	1		%	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND	0.019348	1		mg/L	++	0.00008	0.0003			
SREV	BERYLLIUM	REC	97	1		%	++	0.00008	0.0003			
SREV	CADMIUM	FOUND	0.020083	1		mg/L	++	0.00005	0.0003			
SREV	CADMIUM	REC	100	1		%	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND	0.01977	1		mg/L	++	0.0005	0.002			
SREV	CHROMIUM	REC	99	1		%	++	0.0005	0.002			
SREV	COBALT	FOUND	0.01911	1		mg/L	++	0.00005	0.0003			
SREV	COBALT	REC	95	1		%	++	0.00005	0.0003			
SREV	COPPER	FOUND	0.01746	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	87	1		%	++	0.0008	0.002			
SREV	LEAD	FOUND	0.02041	1		mg/L	++	0.0001	0.0005			
SREV	LEAD	REC	102	1		%	++	0.0001	0.0005			
SREV	MANGANESE	FOUND	0.01975	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	99	1		%	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND	1.05695	1		mg/L	++	0.0002	0.0005			
SREV	MOLYBDENUM	REC	104	1		%	++	0.0002	0.0005			
SREV	NICKEL	FOUND	0.0186	1		mg/L	++	0.0004	0.001			
SREV	NICKEL	REC	93	1		%	++	0.0004	0.001			
SREV	SELENIUM	FOUND	0.02044	1		mg/L	++	0.0001	0.0003			
SREV	SELENIUM	REC	102	1		%	++	0.0001	0.0003			
SREV	SILVER	FOUND	0.00961	1		mg/L	++	0.0001	0.0005			
SREV	SILVER	REC	96	1		%	++	0.0001	0.0005			
SREV	THALLIUM	FOUND	0.02051	1		mg/L	++	0.0001	0.0005			
SREV	THALLIUM	REC	102	1		%	++	0.0001	0.0005			
SREV	THORIUM	FOUND	0.0523	1		mg/L	++	0.001	0.005			
SREV	THORIUM	REC	105	1		%	++	0.001	0.005			
SREV	URANIUM	FOUND	0.0215	1		mg/L	++	0.0001	0.0005			
SREV	URANIUM	REC	108	1		%	++	0.0001	0.0005			
SREV	VANADIUM	FOUND	0.02044	1		mg/L	++	0.0005	0.002			
SREV	VANADIUM	REC	102	1		%	++	0.0005	0.002			
SREV	ZINC	FOUND	0.0217	1		mg/L	++	0.004	0.01			
SREV	ZINC	REC	108	1		%	++	0.004	0.01			

WG488413PBS

Tag:

Measured: 1/2/2020 12:36:41 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	ARSENIC	FOUND		1	U	mg/L	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND		1	U	mg/L	++	0.00008	0.0003			
SREV	CADMIUM	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	COBALT	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	LEAD	FOUND		1	U	mg/L	++	0.0001	0.0005			
FAIL	MANGANESE	FOUND	0.00427	1		mg/L	ALRT	0.0004	0.002			
SREV	MOLYBDENUM	FOUND		1	U	mg/L	++	0.0002	0.0005			
SREV	NICKEL	FOUND		1	U	mg/L	++	0.0004	0.001			
SREV	SELENIUM	FOUND		1	U	mg/L	++	0.0001	0.0003			
SREV	SILVER	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THALLIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THORIUM	FOUND		1	U	mg/L	++	0.001	0.005			
SREV	URANIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	VANADIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	ZINC	FOUND		1	U	mg/L	++	0.004	0.01			

L56452-01

Tag:

Measured: 1/2/2020 12:38:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT	.0061	2		mg/L	++	0.0008	0.004			
SREV	ARSENIC	IS-MWMT	.0136	2		mg/L	++	0.0004	0.002		ZG	
NEED	BERYLLIUM	REG		2	U	mg/L	++	0.0002	0.0005			
SREV	CADMIUM	IS-MWMT		2	U	mg/L	++	0.0001	0.0005			
NEED	CHROMIUM	REG	.002	2	B	mg/L	++	0.001	0.004			
NEED	COBALT	REG	.0002	2	B	mg/L	++	0.0001	0.0005			
NEED	COPPER	REG	.006	2		mg/L	++	0.002	0.004			
SREV	LEAD	IS-MWMT		2	U	mg/L	++	0.0002	0.001			
NEED	MANGANESE	REG	.0376	2		mg/L	++	0.0008	0.004			
NEED	MOLYBDENUM	REG	.0166	2		mg/L	++	0.0004	0.001			
NEED	NICKEL	REG	.0036	2		mg/L	++	0.0008	0.002			
REDO	SELENIUM	REG		2	LU	mg/L	LOW	0.0002	0.0005		TA	
NEED	SILVER	REG		2	U	mg/L	++	0.0002	0.001			
SREV	THALLIUM	IS-MWMT	.0005	2	B	mg/L	++	0.0002	0.001			
NEED	THORIUM	REG		2	U	mg/L	++	0.002	0.01			
NEED	URANIUM	REG		2	U	mg/L	++	0.0002	0.001			
NEED	VANADIUM	REG		2	U	mg/L	++	0.001	0.004			
NEED	ZINC	REG		2	U	mg/L	++	0.008	0.02			

L56452-01MS1 **Tag:** Not associated with project samples **Measured:** 1/2/2020 12:40:14 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.02765	2		mg/L	++	0.0008	0.004			
SREV	ANTIMONY	REC	108	2		%	++	0.0008	0.004			
SREV	ARSENIC	FOUND	0.11458	2		mg/L	++	0.0004	0.002			
SREV	ARSENIC	REC	101	2		%	++	0.0004	0.002			
SREV	BERYLLIUM	FOUND	0.09045	2		mg/L	++	0.0002	0.0005			
SREV	BERYLLIUM	REC	90	2		%	++	0.0002	0.0005			
SREV	CADMIUM	FOUND	0.0987	2		mg/L	++	0.0001	0.0005			
SREV	CADMIUM	REC	99	2		%	++	0.0001	0.0005			
SREV	CHROMIUM	FOUND	0.0976	2		mg/L	++	0.001	0.004			
SREV	CHROMIUM	REC	96	2		%	++	0.001	0.004			
SREV	COBALT	FOUND	0.08891	2		mg/L	++	0.0001	0.0005			
SREV	COBALT	REC	89	2		%	++	0.0001	0.0005			
SREV	COPPER	FOUND	0.0951	2		mg/L	++	0.002	0.004			
SREV	COPPER	REC	89	2		%	++	0.002	0.004			
SREV	LEAD	FOUND	0.10231	2		mg/L	++	0.0002	0.001			
SREV	LEAD	REC	102	2		%	++	0.0002	0.001			
SREV	MANGANESE	FOUND	0.1239	2		mg/L	++	0.0008	0.004			
SREV	MANGANESE	REC	86	2		%	++	0.0008	0.004			
SREV	MOLYBDENUM	FOUND	0.11689	2		mg/L	++	0.0004	0.001			
SREV	MOLYBDENUM	REC	100	2		%	++	0.0004	0.001			
SREV	NICKEL	FOUND	0.09693	2		mg/L	++	0.0008	0.002			
SREV	NICKEL	REC	93	2		%	++	0.0008	0.002			
SREV	SELENIUM	FOUND	0.09499	2		mg/L	++	0.0002	0.0005			
SREV	SELENIUM	REC	95	2		%	++	0.0002	0.0005			
SREV	SILVER	FOUND	0.01907	2		mg/L	++	0.0002	0.001			
SREV	SILVER	REC	95	2		%	++	0.0002	0.001			
SREV	THALLIUM	FOUND	0.10021	2		mg/L	++	0.0002	0.001			
SREV	THALLIUM	REC	100	2		%	++	0.0002	0.001			
SREV	THORIUM	FOUND	0.1078	2		mg/L	++	0.002	0.01			
SREV	THORIUM	REC	108	2		%	++	0.002	0.01			
SREV	URANIUM	FOUND	0.10529	2		mg/L	++	0.0002	0.001			
SREV	URANIUM	REC	105	2		%	++	0.0002	0.001			
SREV	VANADIUM	FOUND	0.1005	2		mg/L	++	0.001	0.004			
SREV	VANADIUM	REC	100	2		%	++	0.001	0.004			
SREV	ZINC	FOUND	0.0926	2		mg/L	++	0.008	0.02			
SREV	ZINC	REC	92	2		%	++	0.008	0.02			

L56452-01MSD1 **Tag:** Not associated with project samples **Measured:** 1/2/2020 12:42:01 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.02737	2		mg/L	++	0.0008	0.004			
SREV	ANTIMONY	REC	106	2		%	++	0.0008	0.004			
SREV	ANTIMONY	RPD	1	2		%	++	0.0008	0.004			
SREV	ARSENIC	FOUND	0.11181	2		mg/L	++	0.0004	0.002			
SREV	ARSENIC	REC	98	2		%	++	0.0004	0.002			
SREV	ARSENIC	RPD	2	2		%	++	0.0004	0.002			
SREV	BERYLLIUM	FOUND	0.0899	2		mg/L	++	0.0002	0.0005			
SREV	BERYLLIUM	REC	90	2		%	++	0.0002	0.0005			
SREV	BERYLLIUM	RPD	1	2		%	++	0.0002	0.0005			
SREV	CADMIUM	FOUND	0.09756	2		mg/L	++	0.0001	0.0005			
SREV	CADMIUM	REC	97	2		%	++	0.0001	0.0005			
SREV	CADMIUM	RPD	1	2		%	++	0.0001	0.0005			
SREV	CHROMIUM	FOUND	0.0957	2		mg/L	++	0.001	0.004			
SREV	CHROMIUM	REC	94	2		%	++	0.001	0.004			
SREV	CHROMIUM	RPD	2	2		%	++	0.001	0.004			
SREV	COBALT	FOUND	0.08779	2		mg/L	++	0.0001	0.0005			
SREV	COBALT	REC	88	2		%	++	0.0001	0.0005			
SREV	COBALT	RPD	1	2		%	++	0.0001	0.0005			
SREV	COPPER	FOUND	0.0929	2		mg/L	++	0.002	0.004			
SREV	COPPER	REC	87	2		%	++	0.002	0.004			
SREV	COPPER	RPD	2	2		%	++	0.002	0.004			
SREV	LEAD	FOUND	0.1011	2		mg/L	++	0.0002	0.001			
SREV	LEAD	REC	101	2		%	++	0.0002	0.001			
SREV	LEAD	RPD	1	2		%	++	0.0002	0.001			
SREV	MANGANESE	FOUND	0.12356	2		mg/L	++	0.0008	0.004			
SREV	MANGANESE	REC	86	2		%	++	0.0008	0.004			
SREV	MANGANESE	RPD	0	2		%	++	0.0008	0.004			
SREV	MOLYBDENUM	FOUND	0.1155	2		mg/L	++	0.0004	0.001			
SREV	MOLYBDENUM	REC	99	2		%	++	0.0004	0.001			
SREV	MOLYBDENUM	RPD	1	2		%	++	0.0004	0.001			
SREV	NICKEL	FOUND	0.09352	2		mg/L	++	0.0008	0.002			
SREV	NICKEL	REC	90	2		%	++	0.0008	0.002			
SREV	NICKEL	RPD	4	2		%	++	0.0008	0.002			
SREV	SELENIUM	FOUND	0.09243	2		mg/L	++	0.0002	0.0005			
SREV	SELENIUM	REC	92	2		%	++	0.0002	0.0005			
SREV	SELENIUM	RPD	3	2		%	++	0.0002	0.0005			
SREV	SILVER	FOUND	0.01888	2		mg/L	++	0.0002	0.001			
SREV	SILVER	REC	94	2		%	++	0.0002	0.001			
SREV	SILVER	RPD	1	2		%	++	0.0002	0.001			
SREV	THALLIUM	FOUND	0.09895	2		mg/L	++	0.0002	0.001			
SREV	THALLIUM	REC	98	2		%	++	0.0002	0.001			
SREV	THALLIUM	RPD	1	2		%	++	0.0002	0.001			
SREV	THORIUM	FOUND	0.1071	2		mg/L	++	0.002	0.01			
SREV	THORIUM	REC	107	2		%	++	0.002	0.01			
SREV	THORIUM	RPD	1	2		%	++	0.002	0.01			
SREV	URANIUM	FOUND	0.10482	2		mg/L	++	0.0002	0.001			
SREV	URANIUM	REC	105	2		%	++	0.0002	0.001			
SREV	URANIUM	RPD	0	2		%	++	0.0002	0.001			
SREV	VANADIUM	FOUND	0.0978	2		mg/L	++	0.001	0.004			
SREV	VANADIUM	REC	98	2		%	++	0.001	0.004			
SREV	VANADIUM	RPD	3	2		%	++	0.001	0.004			
SREV	ZINC	FOUND	0.0923	2		mg/L	++	0.008	0.02			
SREV	ZINC	REC	92	2		%	++	0.008	0.02			

SREV	ZINC	RPD	0	2	%	++	0.008	0.02

WG488413LFB2 **Tag:** **Measured:** **1/2/2020 12:43:48 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.01018	1		mg/L	++	0.0004	0.002			
SREV	ANTIMONY	REC	102	1		%	++	0.0004	0.002			
SREV	ARSENIC	FOUND	0.04834	1		mg/L	++	0.0002	0.001			
SREV	ARSENIC	REC	97	1		%	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND	0.04651	1		mg/L	++	0.00008	0.0003			
SREV	BERYLLIUM	REC	93	1		%	++	0.00008	0.0003			
SREV	CADMIUM	FOUND	0.048116	1		mg/L	++	0.00005	0.0003			
SREV	CADMIUM	REC	96	1		%	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND	0.04812	1		mg/L	++	0.0005	0.002			
SREV	CHROMIUM	REC	96	1		%	++	0.0005	0.002			
SREV	COBALT	FOUND	0.047881	1		mg/L	++	0.00005	0.0003			
SREV	COBALT	REC	96	1		%	++	0.00005	0.0003			
SREV	COPPER	FOUND	0.0466	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	93	1		%	++	0.0008	0.002			
SREV	LEAD	FOUND	0.04791	1		mg/L	++	0.0001	0.0005			
SREV	LEAD	REC	96	1		%	++	0.0001	0.0005			
SREV	MANGANESE	FOUND	0.05216	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	104	1		%	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND	0.04689	1		mg/L	++	0.0002	0.0005			
SREV	MOLYBDENUM	REC	94	1		%	++	0.0002	0.0005			
SREV	NICKEL	FOUND	0.04728	1		mg/L	++	0.0004	0.001			
SREV	NICKEL	REC	95	1		%	++	0.0004	0.001			
SREV	SELENIUM	FOUND	0.04901	1		mg/L	++	0.0001	0.0003			
SREV	SELENIUM	REC	98	1		%	++	0.0001	0.0003			
SREV	SILVER	FOUND	0.00996	1		mg/L	++	0.0001	0.0005			
SREV	SILVER	REC	99	1		%	++	0.0001	0.0005			
SREV	THALLIUM	FOUND	0.04728	1		mg/L	++	0.0001	0.0005			
SREV	THALLIUM	REC	94	1		%	++	0.0001	0.0005			
SREV	THORIUM	FOUND	0.0477	1		mg/L	++	0.001	0.005			
SREV	THORIUM	REC	95	1		%	++	0.001	0.005			
SREV	URANIUM	FOUND	0.04687	1		mg/L	++	0.0001	0.0005			
SREV	URANIUM	REC	94	1		%	++	0.0001	0.0005			
SREV	VANADIUM	FOUND	0.04812	1		mg/L	++	0.0005	0.002			
SREV	VANADIUM	REC	96	1		%	++	0.0005	0.002			
SREV	ZINC	FOUND	0.0487	1		mg/L	++	0.004	0.01			
SREV	ZINC	REC	97	1		%	++	0.004	0.01			

WG488184PBS

Tag:

Measured: 1/2/2020 12:45:34 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	ARSENIC	FOUND		1	U	mg/L	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND		1	U	mg/L	++	0.00008	0.0003			
SREV	CADMIUM	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	COBALT	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	LEAD	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND		1	U	mg/L	++	0.0002	0.0005			
SREV	NICKEL	FOUND		1	U	mg/L	++	0.0004	0.001			
SREV	SELENIUM	FOUND		1	U	mg/L	++	0.0001	0.0003			
SREV	SILVER	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THALLIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THORIUM	FOUND		1	U	mg/L	++	0.001	0.005			
SREV	URANIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	VANADIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	ZINC	FOUND		1	U	mg/L	++	0.004	0.01			

L56331-01

Tag:

Measured: 1/2/2020 12:47:21 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT		5	U	mg/L	++	0.002	0.01			
SREV	ARSENIC	IS-MWMT	.005	5		mg/L	++	0.001	0.005		ZG	
SREV	BERYLLIUM	IS-MWMT	.0034	5		mg/L	++	0.0004	0.001			
SREV	CADMIUM	IS-MWMT	.0089	5		mg/L	++	0.0003	0.001			
SREV	CHROMIUM	IS-MWMT		5	U	mg/L	++	0.003	0.01			
SREV	COBALT	IS-MWMT	.469	5		mg/L	++	0.0003	0.001		M3	
REDO	COPPER	REG	467	5	O	mg/L	OCAL	0.004	0.01			
SREV	LEAD	IS-MWMT		5	U	mg/L	++	0.0005	0.003			
SREV	MANGANESE	IS-MWMT	6.25	5		mg/L	++	0.002	0.01		M3	
SREV	MOLYBDENUM	IS-MWMT		5	U	mg/L	++	0.001	0.003			
SREV	NICKEL	IS-MWMT	.402	5		mg/L	++	0.002	0.005		M3	
SREV	SELENIUM	IS-MWMT	.0258	5		mg/L	++	0.0005	0.001			
SREV	SILVER	IS-MWMT		5	U	mg/L	++	0.0005	0.003			
SREV	THALLIUM	IS-MWMT	.0029	5	B	mg/L	++	0.0005	0.003			
SREV	THORIUM	IS-MWMT		5	U	mg/L	++	0.005	0.03		TB	
SREV	URANIUM	IS-MWMT	.0322	5		mg/L	++	0.0005	0.003			
SREV	VANADIUM	IS-MWMT		5	U	mg/L	++	0.003	0.01			
SREV	ZINC	IS-MWMT	1.43	5		mg/L	++	0.02	0.05		M3	

L56331-02

Tag:

Measured: 1/2/2020 12:49:08 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT		2	U	mg/L	++	0.0008	0.004			
SREV	ARSENIC	IS-MWMT	.0016	2	B	mg/L	++	0.0004	0.002		ZG	
SREV	BERYLLIUM	IS-MWMT	.0018	2		mg/L	++	0.0002	0.0005			
SREV	CADMIUM	IS-MWMT	.0052	2		mg/L	++	0.0001	0.0005			
SREV	CHROMIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	COBALT	IS-MWMT	.440	2		mg/L	++	0.0001	0.0005		M3	
REDO	COPPER	REG	52.6	2	O	mg/L	OCAL	0.002	0.004			
SREV	LEAD	IS-MWMT	.0013	2		mg/L	++	0.0002	0.001			
REDO	MANGANESE	REG	8.81	2	O	mg/L	OCAL	0.0008	0.004			
SREV	MOLYBDENUM	IS-MWMT	.0012	2		mg/L	++	0.0004	0.001			
SREV	NICKEL	IS-MWMT	.233	2		mg/L	++	0.0008	0.002		M3	
SREV	SELENIUM	IS-MWMT	.0518	2		mg/L	++	0.0002	0.0005			
SREV	SILVER	IS-MWMT		2	U	mg/L	++	0.0002	0.001			
SREV	THALLIUM	IS-MWMT	.0007	2	B	mg/L	++	0.0002	0.001			
SREV	THORIUM	IS-MWMT		2	U	mg/L	++	0.002	0.01		TB	
SREV	URANIUM	IS-MWMT	.0243	2		mg/L	++	0.0002	0.001			
SREV	VANADIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	ZINC	IS-MWMT	.451	2		mg/L	++	0.008	0.02		M3	

L56331-03

Tag:

Measured: 1/2/2020 12:50:55 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT	.0009	2	B	mg/L	++	0.0008	0.004			
SREV	ARSENIC	IS-MWMT	.0018	2	B	mg/L	++	0.0004	0.002		ZG	
SREV	BERYLLIUM	IS-MWMT	.0008	2		mg/L	++	0.0002	0.0005			
SREV	CADMIUM	IS-MWMT	.0016	2		mg/L	++	0.0001	0.0005			
SREV	CHROMIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	COBALT	IS-MWMT	.0762	2		mg/L	++	0.0001	0.0005		M3	
REDO	COPPER	REG	60.5	2	O	mg/L	OCAL	0.002	0.004			
SREV	LEAD	IS-MWMT	.0004	2	B	mg/L	++	0.0002	0.001			
SREV	MANGANESE	IS-MWMT	1.05	2		mg/L	++	0.0008	0.004		M3	
SREV	MOLYBDENUM	IS-MWMT		2	U	mg/L	++	0.0004	0.001			
SREV	NICKEL	IS-MWMT	.084	2		mg/L	++	0.0008	0.002		M3	
SREV	SELENIUM	IS-MWMT	.0026	2		mg/L	++	0.0002	0.0005			
SREV	SILVER	IS-MWMT		2	U	mg/L	++	0.0002	0.001			
SREV	THALLIUM	IS-MWMT	.0005	2	B	mg/L	++	0.0002	0.001			
SREV	THORIUM	IS-MWMT		2	U	mg/L	++	0.002	0.01		TB	
SREV	URANIUM	IS-MWMT	.004	2		mg/L	++	0.0002	0.001			
SREV	VANADIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	ZINC	IS-MWMT	.240	2		mg/L	++	0.008	0.02		M3	

L56331-04 **Tag:** **Measured: 1/2/2020 12:52:42 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT		2	U	mg/L	++	0.0008	0.004			
SREV	ARSENIC	IS-MWMT	.0025	2		mg/L	++	0.0004	0.002		ZG	
SREV	BERYLLIUM	IS-MWMT	.0049	2		mg/L	++	0.0002	0.0005			
SREV	CADMIUM	IS-MWMT	.0059	2		mg/L	++	0.0001	0.0005			
SREV	CHROMIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	COBALT	IS-MWMT	.690	2		mg/L	++	0.0001	0.0005		M3	
REDO	COPPER	REG	72.7	2	O	mg/L	OCAL	0.002	0.004			
SREV	LEAD	IS-MWMT	.0004	2	B	mg/L	++	0.0002	0.001			
REDO	MANGANESE	REG	13.8	2	O	mg/L	OCAL	0.0008	0.004			
SREV	MOLYBDENUM	IS-MWMT	.0011	2		mg/L	++	0.0004	0.001			
SREV	NICKEL	IS-MWMT	.395	2		mg/L	++	0.0008	0.002		M3	
SREV	SELENIUM	IS-MWMT	.104	2		mg/L	++	0.0002	0.0005			
SREV	SILVER	IS-MWMT		2	U	mg/L	++	0.0002	0.001			
SREV	THALLIUM	IS-MWMT	.0003	2	B	mg/L	++	0.0002	0.001			
SREV	THORIUM	IS-MWMT		2	U	mg/L	++	0.002	0.01		TB	
SREV	URANIUM	IS-MWMT	.0382	2		mg/L	++	0.0002	0.001			
SREV	VANADIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	ZINC	IS-MWMT	.540	2		mg/L	++	0.008	0.02		M3	

WG489196CCV1

Tag:

Measured: 1/2/2020 12:54:29 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.0124	1		mg/L	++	0.0004	0.002			
SREV	ANTIMONY	REC	99	1		%	++	0.0004	0.002			
SREV	ARSENIC	FOUND	0.10397	1		mg/L	++	0.0002	0.001			
SREV	ARSENIC	REC	104	1		%	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND	0.096001	1		mg/L	++	0.00008	0.0003			
SREV	BERYLLIUM	REC	96	1		%	++	0.00008	0.0003			
SREV	CADMIUM	FOUND	0.099903	1		mg/L	++	0.00005	0.0003			
SREV	CADMIUM	REC	100	1		%	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND	0.1027	1		mg/L	++	0.0005	0.002			
SREV	CHROMIUM	REC	103	1		%	++	0.0005	0.002			
SREV	COBALT	FOUND	0.098177	1		mg/L	++	0.00005	0.0003			
SREV	COBALT	REC	98	1		%	++	0.00005	0.0003			
SREV	COPPER	FOUND	0.26162	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	104	1		%	++	0.0008	0.002			
SREV	LEAD	FOUND	0.24654	1		mg/L	++	0.0001	0.0005			
SREV	LEAD	REC	99	1		%	++	0.0001	0.0005			
SREV	MANGANESE	FOUND	0.1004 ✓	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	100	1		%	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND	0.09822 ✓	1		mg/L	++	0.0002	0.0005			
SREV	MOLYBDENUM	REC	98	1		%	++	0.0002	0.0005			
SREV	NICKEL	FOUND	0.25804	1		mg/L	++	0.0004	0.001			
SREV	NICKEL	REC	103	1		%	++	0.0004	0.001			
SREV	SELENIUM	FOUND	0.25702	1		mg/L	++	0.0001	0.0003			
SREV	SELENIUM	REC	103	1		%	++	0.0001	0.0003			
SREV	SILVER	FOUND	0.02467	1		mg/L	++	0.0001	0.0005			
SREV	SILVER	REC	98	1		%	++	0.0001	0.0005			
SREV	THALLIUM	FOUND	0.09827	1		mg/L	++	0.0001	0.0005			
SREV	THALLIUM	REC	98	1		%	++	0.0001	0.0005			
SREV	THORIUM	FOUND	0.0983	1		mg/L	++	0.001	0.005			
SREV	THORIUM	REC	98	1		%	++	0.001	0.005			
SREV	URANIUM	FOUND	0.0983	1		mg/L	++	0.0001	0.0005			
SREV	URANIUM	REC	98	1		%	++	0.0001	0.0005			
SREV	VANADIUM	FOUND	0.10183	1		mg/L	++	0.0005	0.002			
SREV	VANADIUM	REC	102	1		%	++	0.0005	0.002			
SREV	ZINC	FOUND	0.4953	1		mg/L	++	0.004	0.01			
SREV	ZINC	REC	99	1		%	++	0.004	0.01			

WG489196CCB1

Tag:

Measured: 1/2/2020 12:56:15 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	ARSENIC	FOUND		1	U	mg/L	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND		1	U	mg/L	++	0.00008	0.0003			
SREV	CADMIUM	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	COBALT	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	COPPER	FOUND	0.00223 ✓	1		mg/L	++	0.0008	0.002	5x = 0.01115		
SREV	LEAD	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND		1	U	mg/L	++	0.0002	0.0005			
SREV	NICKEL	FOUND		1	U	mg/L	++	0.0004	0.001			
SREV	SELENIUM	FOUND	0.00015 ✓	1	B	mg/L	++	0.0001	0.0003	5x= 0.00075		
SREV	SILVER	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THALLIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THORIUM	FOUND		1	U	mg/L	++	0.001	0.005	Se in all samples is above the limit; copper is not reported from this sequence		
SREV	URANIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	VANADIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	ZINC	FOUND		1	U	mg/L	++	0.004	0.01			

L56331-05

Tag:

Measured: 1/2/2020 12:58:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT		2	U	mg/L	++	0.0008	0.004			
SREV	ARSENIC	IS-MWMT	.0048	2		mg/L	++	0.0004	0.002		ZG	
SREV	BERYLLIUM	IS-MWMT	.007	2		mg/L	++	0.0002	0.0005			
SREV	CADMIUM	IS-MWMT	.0036	2		mg/L	++	0.0001	0.0005			
SREV	CHROMIUM	IS-MWMT	.001	2	B	mg/L	++	0.001	0.004			
SREV	COBALT	IS-MWMT	.511	2		mg/L	++	0.0001	0.0005		M3	
REDO	COPPER	REG	150	2	O	mg/L	OCAL	0.002	0.004			
SREV	LEAD	IS-MWMT	.0007	2	B	mg/L	++	0.0002	0.001			
REDO	MANGANESE	REG	4.49	2	O	mg/L	OCAL	0.0008	0.004			
SREV	MOLYBDENUM	IS-MWMT		2	U	mg/L	++	0.0004	0.001			
SREV	NICKEL	IS-MWMT	.314	2		mg/L	++	0.0008	0.002		M3	
SREV	SELENIUM	IS-MWMT	.0192	2		mg/L	++	0.0002	0.0005			
SREV	SILVER	IS-MWMT		2	U	mg/L	++	0.0002	0.001			
SREV	THALLIUM	IS-MWMT	.0003	2	B	mg/L	++	0.0002	0.001			
SREV	THORIUM	IS-MWMT		2	U	mg/L	++	0.002	0.01		TB	
SREV	URANIUM	IS-MWMT	.0505	2		mg/L	++	0.0002	0.001			
SREV	VANADIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	ZINC	IS-MWMT	.503	2		mg/L	++	0.008	0.02		M3	

L56331-05MS1 Tag: Measured: 1/2/2020 12:59:47 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.01027	2		mg/L	++	0.0008	0.004			
SREV	ANTIMONY	REC	103	2		%	++	0.0008	0.004			
SREV	ARSENIC	FOUND	0.0498	2		mg/L	++	0.0004	0.002			
SREV	ARSENIC	REC	90	2		%	++	0.0004	0.002			
SREV	BERYLLIUM	FOUND	0.049	2		mg/L	++	0.0002	0.0005			
SREV	BERYLLIUM	REC	84	2		%	++	0.0002	0.0005			
SREV	CADMIUM	FOUND	0.04987	2		mg/L	++	0.0001	0.0005			
SREV	CADMIUM	REC	92	2		%	++	0.0001	0.0005			
SREV	CHROMIUM	FOUND	0.0455	2		mg/L	++	0.001	0.004			
SREV	CHROMIUM	REC	89	2		%	++	0.001	0.004			
SREV	COBALT	FOUND	0.54602	2		mg/L	++	0.0001	0.0005			
SREV	COBALT	REC	69	2		%	ALRT	0.0001	0.0005	4x	M3	
FAIL	COPPER	FOUND	147.9693	2		mg/L	++	0.002	0.004			
FAIL	COPPER	REC	-4053	2		%	ALRT	0.002	0.004			
SREV	LEAD	FOUND	0.05042	2		mg/L	++	0.0002	0.001			
SREV	LEAD	REC	99	2		%	++	0.0002	0.001			
SREV	MANGANESE	FOUND	4.48338	2		mg/L	++	0.0008	0.004			
SREV	MANGANESE	REC	-13	2		%	ALRT	0.0008	0.004	4x	M3	
SREV	MOLYBDENUM	FOUND	0.04734	2		mg/L	++	0.0004	0.001			
SREV	MOLYBDENUM	REC	94	2		%	++	0.0004	0.001			
SREV	NICKEL	FOUND	0.34913	2		mg/L	++	0.0008	0.002			
SREV	NICKEL	REC	70	2		%	ALRT	0.0008	0.002	4x	M3	
SREV	SELENIUM	FOUND	0.0671	2		mg/L	++	0.0002	0.0005			
SREV	SELENIUM	REC	96	2		%	++	0.0002	0.0005			
SREV	SILVER	FOUND	0.00889	2		mg/L	++	0.0002	0.001			
SREV	SILVER	REC	89	2		%	++	0.0002	0.001			
SREV	THALLIUM	FOUND	0.05133	2		mg/L	++	0.0002	0.001			
SREV	THALLIUM	REC	102	2		%	++	0.0002	0.001			
SREV	THORIUM	FOUND	0.0525	2		mg/L	++	0.002	0.01			
SREV	THORIUM	REC	105	2		%	++	0.002	0.01			
SREV	URANIUM	FOUND	0.1007	2		mg/L	++	0.0002	0.001			
SREV	URANIUM	REC	100	2		%	++	0.0002	0.001			
SREV	VANADIUM	FOUND	0.0462	2		mg/L	++	0.001	0.004			
SREV	VANADIUM	REC	92	2		%	++	0.001	0.004			
SREV	ZINC	FOUND	0.5397	2		mg/L	++	0.008	0.02			
SREV	ZINC	REC	73	2		%	ALRT	0.008	0.02	4x	M3	

all failures have original concentrations are greater than 4x the spike concentration

L56331-05MSD1 Tag: **Measured: 1/2/2020 1:01:34 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.01059	2		mg/L	++	0.0008	0.004			
SREV	ANTIMONY	REC	106	2		%	++	0.0008	0.004			
SREV	ANTIMONY	RPD	3	2		%	++	0.0008	0.004			
SREV	ARSENIC	FOUND	0.05233	2		mg/L	++	0.0004	0.002			
SREV	ARSENIC	REC	95	2		%	++	0.0004	0.002			
SREV	ARSENIC	RPD	5	2		%	++	0.0004	0.002			
SREV	BERYLLIUM	FOUND	0.04951	2		mg/L	++	0.0002	0.0005			
SREV	BERYLLIUM	REC	85	2		%	++	0.0002	0.0005			
SREV	BERYLLIUM	RPD	1	2		%	++	0.0002	0.0005			
SREV	CADMIUM	FOUND	0.05108 ✓	2		mg/L	++	0.0001	0.0005			
SREV	CADMIUM	REC	95	2		%	++	0.0001	0.0005			
SREV	CADMIUM	RPD	2	2		%	++	0.0001	0.0005			
SREV	CHROMIUM	FOUND	0.048	2		mg/L	++	0.001	0.004			
SREV	CHROMIUM	REC	94	2		%	++	0.001	0.004			
SREV	CHROMIUM	RPD	5	2		%	++	0.001	0.004			
SREV	COBALT	FOUND	0.54991	2		mg/L	++	0.0001	0.0005			
SREV	COBALT	REC	77	2		%	++	0.0001	0.0005			
SREV	COBALT	RPD	1	2		%	++	0.0001	0.0005			
FAIL	COPPER	FOUND	155.1793	2		mg/L	++	0.002	0.004	4x		
FAIL	COPPER	REC	10338	2		%	ALRT	0.002	0.004			
FAIL	COPPER	RPD	5	2		%	++	0.002	0.004			
SREV	LEAD	FOUND	0.05138	2		mg/L	++	0.0002	0.001			
SREV	LEAD	REC	101	2		%	++	0.0002	0.001			
SREV	LEAD	RPD	2	2		%	++	0.0002	0.001			
SREV	MANGANESE	FOUND	4.55277	2		mg/L	++	0.0008	0.004			
SREV	MANGANESE	REC	125	2		%	++	0.0008	0.004			
SREV	MANGANESE	RPD	2	2		%	++	0.0008	0.004			
SREV	MOLYBDENUM	FOUND	0.04892	2		mg/L	++	0.0004	0.001			
SREV	MOLYBDENUM	REC	98	2		%	++	0.0004	0.001			
SREV	MOLYBDENUM	RPD	3	2		%	++	0.0004	0.001			
SREV	NICKEL	FOUND	0.36869	2		mg/L	++	0.0008	0.002			
SREV	NICKEL	REC	109	2		%	++	0.0008	0.002			
SREV	NICKEL	RPD	5	2		%	++	0.0008	0.002			
SREV	SELENIUM	FOUND	0.07033	2		mg/L	++	0.0002	0.0005			
SREV	SELENIUM	REC	102	2		%	++	0.0002	0.0005			
SREV	SELENIUM	RPD	5	2		%	++	0.0002	0.0005			
SREV	SILVER	FOUND	0.00912 ✓	2		mg/L	++	0.0002	0.001			
SREV	SILVER	REC	91	2		%	++	0.0002	0.001			
SREV	SILVER	RPD	3	2		%	++	0.0002	0.001			
SREV	THALLIUM	FOUND	0.05235	2		mg/L	++	0.0002	0.001			
SREV	THALLIUM	REC	104	2		%	++	0.0002	0.001			
SREV	THALLIUM	RPD	2	2		%	++	0.0002	0.001			
SREV	THORIUM	FOUND	0.0536	2		mg/L	++	0.002	0.01			
SREV	THORIUM	REC	107	2		%	++	0.002	0.01			
SREV	THORIUM	RPD	2	2		%	++	0.002	0.01			
SREV	URANIUM	FOUND	0.10232	2		mg/L	++	0.0002	0.001			
SREV	URANIUM	REC	104	2		%	++	0.0002	0.001			
SREV	URANIUM	RPD	2	2		%	++	0.0002	0.001			
SREV	VANADIUM	FOUND	0.0486	2		mg/L	++	0.001	0.004			
SREV	VANADIUM	REC	97	2		%	++	0.001	0.004			
SREV	VANADIUM	RPD	5	2		%	++	0.001	0.004			
SREV	ZINC	FOUND	0.5499	2		mg/L	++	0.008	0.02			
SREV	ZINC	REC	94	2		%	++	0.008	0.02			

all failures have original concentrations are greater than 4x the spike concentration

SREV	ZINC	RPD	2	2		%	++	0.008	0.02

L56331-06 **Tag:** **Measured: 1/2/2020 1:03:22 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT	.001	1	B	mg/L	++	0.0004	0.002			
SREV	ARSENIC	IS-MWMT	.0009	1	B	mg/L	++	0.0002	0.001		ZG	
SREV	BERYLLIUM	IS-MWMT		1	U	mg/L	++	0.00008	0.0003			
SREV	CADMIUM	IS-MWMT	.00008	1	B	mg/L	++	0.00005	0.0003			
SREV	CHROMIUM	IS-MWMT		1	U	mg/L	++	0.0005	0.002			
SREV	COBALT	IS-MWMT	.00383	1		mg/L	++	0.00005	0.0003		M3	
REDO	COPPER	REG	.0377	1		mg/L	++	0.0008	0.002			
SREV	LEAD	IS-MWMT		1	U	mg/L	++	0.0001	0.0005			
SREV	MANGANESE	IS-MWMT	.620	1		mg/L	++	0.0004	0.002		M3	
SREV	MOLYBDENUM	IS-MWMT	.0556	1		mg/L	++	0.0002	0.0005			
SREV	NICKEL	IS-MWMT	.003	1		mg/L	++	0.0004	0.001		M3	
SREV	SELENIUM	IS-MWMT	.026	1		mg/L	++	0.0001	0.0003			
SREV	SILVER	IS-MWMT		1	U	mg/L	++	0.0001	0.0005			
SREV	THALLIUM	IS-MWMT		1	U	mg/L	++	0.0001	0.0005			
SREV	THORIUM	IS-MWMT		1	U	mg/L	++	0.001	0.005		TB	
SREV	URANIUM	IS-MWMT	.103	1		mg/L	++	0.0001	0.0005			
SREV	VANADIUM	IS-MWMT		1	U	mg/L	++	0.0005	0.002			
SREV	ZINC	IS-MWMT		1	U	mg/L	++	0.004	0.01		M3	

L56331-06SDL **Tag:** **Measured: 1/2/2020 1:05:09 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	D		1	U	%	++	0.0004	0.002			
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	ANTIMONY	REG	0	1	U	mg/L	++	0.0004	0.002			
SREV	ARSENIC	D	22	1	B	%	ALRT	0.0002	0.001		ZG	
SREV	ARSENIC	FOUND	0.00022	1	B	mg/L	++	0.0002	0.001	Arsenic has an original sample concentration less 50x MDL; no qual.		
SREV	ARSENIC	REG	0.0011	1	B	mg/L	++	0.0002	0.001			
SREV	BERYLLIUM	D		1	U	%	++	0.00008	0.0003			
SREV	BERYLLIUM	FOUND		1	U	mg/L	++	0.00008	0.0003			
SREV	BERYLLIUM	REG	0	1	U	mg/L	++	0.00008	0.0003			
SREV	CADMIUM	D		1	U	%	++	0.00005	0.0003			
SREV	CADMIUM	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	CADMIUM	REG	0	1	U	mg/L	++	0.00005	0.0003			
SREV	CHROMIUM	D		1	U	%	++	0.0005	0.002			
SREV	CHROMIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	CHROMIUM	REG	0	1	U	mg/L	++	0.0005	0.002			
SREV	COBALT	D	10	1		%	++	0.00005	0.0003			
SREV	COBALT	FOUND	0.000843	1		mg/L	++	0.00005	0.0003	Copper is not reported from this sequence		
SREV	COBALT	REG	0.004215	1		mg/L	++	0.00005	0.0003			
FAIL	COPPER	D	11	1		%	ALRT	0.0008	0.002			
FAIL	COPPER	FOUND	0.00837	1		mg/L	++	0.0008	0.002			
FAIL	COPPER	REG	0.04185	1		mg/L	++	0.0008	0.002			
SREV	LEAD	D		1	U	%	++	0.0001	0.0005			
SREV	LEAD	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	LEAD	REG	0	1	U	mg/L	++	0.0001	0.0005			
SREV	MANGANESE	D	10	1		%	++	0.0004	0.002			
SREV	MANGANESE	FOUND	0.13671	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REG	0.68355	1		mg/L	++	0.0004	0.002			
SREV	MOLYBDENUM	D	4	1		%	++	0.0002	0.0005			
SREV	MOLYBDENUM	FOUND	0.01068	1		mg/L	++	0.0002	0.0005			
SREV	MOLYBDENUM	REG	0.0534	1		mg/L	++	0.0002	0.0005			
SREV	NICKEL	D	8	1		%	++	0.0004	0.001			
SREV	NICKEL	FOUND	0.00065	1	B	mg/L	++	0.0004	0.001			
SREV	NICKEL	REG	0.00325	1	B	mg/L	++	0.0004	0.001			
SREV	SELENIUM	D	3	1		%	++	0.0001	0.0003			
SREV	SELENIUM	FOUND	0.00504	1		mg/L	++	0.0001	0.0003			
SREV	SELENIUM	REG	0.0252	1		mg/L	++	0.0001	0.0003			
SREV	SILVER	D		1	U	%	++	0.0001	0.0005			
SREV	SILVER	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	SILVER	REG	0	1	U	mg/L	++	0.0001	0.0005			
SREV	THALLIUM	D		1	U	%	++	0.0001	0.0005			
SREV	THALLIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THALLIUM	REG	0	1	U	mg/L	++	0.0001	0.0005			
SREV	THORIUM	D		1	U	%	++	0.001	0.005			
SREV	THORIUM	FOUND		1	U	mg/L	++	0.001	0.005			
SREV	THORIUM	REG	0	1	U	mg/L	++	0.001	0.005			
SREV	URANIUM	D	1	1		%	++	0.0001	0.0005			
SREV	URANIUM	FOUND	0.02037	1		mg/L	++	0.0001	0.0005			
SREV	URANIUM	REG	0.10185	1		mg/L	++	0.0001	0.0005			
SREV	VANADIUM	D		1	U	%	++	0.0005	0.002			
SREV	VANADIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	VANADIUM	REG	0	1	U	mg/L	++	0.0005	0.002			
SREV	ZINC	D		1	U	%	++	0.004	0.01			
SREV	ZINC	FOUND		1	U	mg/L	++	0.004	0.01			

SREV	ZINC	REG	0	1	U	mg/L	++	0.004	0.01

L56331-07

Tag: Measured: 1/2/2020 1:06:56 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT		2	U	mg/L	++	0.0008	0.004			
SREV	ARSENIC	IS-MWMT	.0043	2		mg/L	++	0.0004	0.002		ZG	
SREV	BERYLLIUM	IS-MWMT	.0052	2		mg/L	++	0.0002	0.0005			
SREV	CADMIUM	IS-MWMT	.0033	2		mg/L	++	0.0001	0.0005			
SREV	CHROMIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	COBALT	IS-MWMT	.493	2		mg/L	++	0.0001	0.0005		M3	
REDO	COPPER	REG	141	2	O	mg/L	OCAL	0.002	0.004			
SREV	LEAD	IS-MWMT	.0005	2	B	mg/L	++	0.0002	0.001			
REDO	MANGANESE	REG	4.49	2	O	mg/L	OCAL	0.0008	0.004			
SREV	MOLYBDENUM	IS-MWMT		2	U	mg/L	++	0.0004	0.001			
SREV	NICKEL	IS-MWMT	.300	2		mg/L	++	0.0008	0.002		M3	
SREV	SELENIUM	IS-MWMT	.0174	2		mg/L	++	0.0002	0.0005			
SREV	SILVER	IS-MWMT		2	U	mg/L	++	0.0002	0.001			
SREV	THALLIUM	IS-MWMT	.0003	2	B	mg/L	++	0.0002	0.001			
SREV	THORIUM	IS-MWMT		2	U	mg/L	++	0.002	0.01		TB	
SREV	URANIUM	IS-MWMT	.0361	2		mg/L	++	0.0002	0.001			
SREV	VANADIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	ZINC	IS-MWMT	.487	2		mg/L	++	0.008	0.02		M3	

L56331-08

Tag: Measured: 1/2/2020 1:08:43 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT	.0009	2	B	mg/L	++	0.0008	0.004			
SREV	ARSENIC	IS-MWMT	.0049	2		mg/L	++	0.0004	0.002		ZG	
SREV	BERYLLIUM	IS-MWMT	.0029	2		mg/L	++	0.0002	0.0005			
SREV	CADMIUM	IS-MWMT	.0023	2		mg/L	++	0.0001	0.0005			
SREV	CHROMIUM	IS-MWMT	.001	2	B	mg/L	++	0.001	0.004			
SREV	COBALT	IS-MWMT	.177	2		mg/L	++	0.0001	0.0005		M3	
REDO	COPPER	REG	168	2	O	mg/L	OCAL	0.002	0.004			
SREV	LEAD	IS-MWMT	.0003	2	B	mg/L	++	0.0002	0.001			
SREV	MANGANESE	IS-MWMT	1.69	2		mg/L	++	0.0008	0.004		M3	
SREV	MOLYBDENUM	IS-MWMT		2	U	mg/L	++	0.0004	0.001			
SREV	NICKEL	IS-MWMT	.182	2		mg/L	++	0.0008	0.002		M3	
SREV	SELENIUM	IS-MWMT	.0051	2		mg/L	++	0.0002	0.0005			
SREV	SILVER	IS-MWMT		2	U	mg/L	++	0.0002	0.001			
SREV	THALLIUM	IS-MWMT	.0007	2	B	mg/L	++	0.0002	0.001			
SREV	THORIUM	IS-MWMT		2	U	mg/L	++	0.002	0.01		TB	
SREV	URANIUM	IS-MWMT	.0228	2		mg/L	++	0.0002	0.001			
SREV	VANADIUM	IS-MWMT		2	U	mg/L	++	0.001	0.004			
SREV	ZINC	IS-MWMT	.429	2		mg/L	++	0.008	0.02		M3	

L56331-09 **Tag:** **Measured: 1/2/2020 1:10:31 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT		5	U	mg/L	++	0.002	0.01			
SREV	ARSENIC	IS-MWMT	.005	5		mg/L	++	0.001	0.005		ZG	
SREV	BERYLLIUM	IS-MWMT	.0067	5		mg/L	++	0.0004	0.001			
SREV	CADMIUM	IS-MWMT	.0076	5		mg/L	++	0.0003	0.001			
SREV	CHROMIUM	IS-MWMT	.006	5	B	mg/L	++	0.003	0.01			
SREV	COBALT	IS-MWMT	.551	5		mg/L	++	0.0003	0.001		M3	
REDO	COPPER	REG	518	5	O	mg/L	OCAL	0.004	0.01			
SREV	LEAD	IS-MWMT	.0018	5	B	mg/L	++	0.0005	0.003			
SREV	MANGANESE	IS-MWMT	5.02	5		mg/L	++	0.002	0.01		M3	
SREV	MOLYBDENUM	IS-MWMT		5	U	mg/L	++	0.001	0.003			
SREV	NICKEL	IS-MWMT	.397	5		mg/L	++	0.002	0.005		M3	
SREV	SELENIUM	IS-MWMT	.0187	5		mg/L	++	0.0005	0.001			
SREV	SILVER	IS-MWMT		5	U	mg/L	++	0.0005	0.003			
SREV	THALLIUM	IS-MWMT	.0017	5	B	mg/L	++	0.0005	0.003			
SREV	THORIUM	IS-MWMT		5	U	mg/L	++	0.005	0.03		TB	
SREV	URANIUM	IS-MWMT	.133	5		mg/L	++	0.0005	0.003			
SREV	VANADIUM	IS-MWMT		5	U	mg/L	++	0.003	0.01			
SREV	ZINC	IS-MWMT	1.49	5		mg/L	++	0.02	0.05		M3	

WG488184LFB2 **Tag:** **Measured: 1/2/2020 1:12:18 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.01017	1		mg/L	++	0.0004	0.002			
SREV	ANTIMONY	REC	102	1		%	++	0.0004	0.002			
SREV	ARSENIC	FOUND	0.04909	1		mg/L	++	0.0002	0.001			
SREV	ARSENIC	REC	98	1		%	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND	0.043819	1		mg/L	++	0.00008	0.0003			
SREV	BERYLLIUM	REC	88	1		%	++	0.00008	0.0003			
SREV	CADMIUM	FOUND	0.047224	1		mg/L	++	0.00005	0.0003			
SREV	CADMIUM	REC	94	1		%	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND	0.04775	1		mg/L	++	0.0005	0.002			
SREV	CHROMIUM	REC	95	1		%	++	0.0005	0.002			
SREV	COBALT	FOUND	0.0462	1		mg/L	++	0.00005	0.0003			
SREV	COBALT	REC	92	1		%	++	0.00005	0.0003			
FAIL	COPPER	FOUND	0.07202	1		mg/L	++	0.0008	0.002			
FAIL	COPPER	REC	144	1		%	ALRT	0.0008	0.002	Copper is not reported from this sequence		
SREV	LEAD	FOUND	0.04739	1		mg/L	++	0.0001	0.0005			
SREV	LEAD	REC	95	1		%	++	0.0001	0.0005			
SREV	MANGANESE	FOUND	0.04658	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	93	1		%	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND	0.04533	1		mg/L	++	0.0002	0.0005			
SREV	MOLYBDENUM	REC	90	1		%	++	0.0002	0.0005			
SREV	NICKEL	FOUND	0.04727	1		mg/L	++	0.0004	0.001			
SREV	NICKEL	REC	95	1		%	++	0.0004	0.001			
SREV	SELENIUM	FOUND	0.04942	1		mg/L	++	0.0001	0.0003			
SREV	SELENIUM	REC	99	1		%	++	0.0001	0.0003			
SREV	SILVER	FOUND	0.00986	1		mg/L	++	0.0001	0.0005			
SREV	SILVER	REC	98	1		%	++	0.0001	0.0005			
SREV	THALLIUM	FOUND	0.04606	1		mg/L	++	0.0001	0.0005			
SREV	THALLIUM	REC	92	1		%	++	0.0001	0.0005			
SREV	THORIUM	FOUND	0.0478	1		mg/L	++	0.001	0.005			
SREV	THORIUM	REC	96	1		%	++	0.001	0.005			
SREV	URANIUM	FOUND	0.04677	1		mg/L	++	0.0001	0.0005			
SREV	URANIUM	REC	94	1		%	++	0.0001	0.0005			
SREV	VANADIUM	FOUND	0.04799	1		mg/L	++	0.0005	0.002			
SREV	VANADIUM	REC	96	1		%	++	0.0005	0.002			
SREV	ZINC	FOUND	0.0483	1		mg/L	++	0.004	0.01			
SREV	ZINC	REC	96	1		%	++	0.004	0.01			

WG488496PBS **Tag:** **Measured:** **1/2/2020 1:14:05 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	ARSENIC	FOUND		1	U	mg/L	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND		1	U	mg/L	++	0.00008	0.0003			
SREV	CADMIUM	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	COBALT	FOUND		1	U	mg/L	++	0.00005	0.0003			
FAIL	COPPER	FOUND	0.00645	1		mg/L	ALRT	0.0008	0.002			
SREV	LEAD	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND		1	U	mg/L	++	0.0002	0.0005			
SREV	NICKEL	FOUND		1	U	mg/L	++	0.0004	0.001			
SREV	SELENIUM	FOUND		1	U	mg/L	++	0.0001	0.0003			
SREV	SILVER	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THALLIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THORIUM	FOUND		1	U	mg/L	++	0.001	0.005			
SREV	URANIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	VANADIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	ZINC	FOUND		1	U	mg/L	++	0.004	0.01			

WG489196CCV2

Tag:

Measured: 1/2/2020 1:15:52 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.01183	1		mg/L	++	0.0004	0.002			
SREV	ANTIMONY	REC	95	1		%	++	0.0004	0.002			
SREV	ARSENIC	FOUND	0.0959	1		mg/L	++	0.0002	0.001			
SREV	ARSENIC	REC	96	1		%	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND	0.091771	1		mg/L	++	0.00008	0.0003			
SREV	BERYLLIUM	REC	92	1		%	++	0.00008	0.0003			
SREV	CADMIUM	FOUND	0.096934	1		mg/L	++	0.00005	0.0003			
SREV	CADMIUM	REC	97	1		%	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND	0.0945	1		mg/L	++	0.0005	0.002			
SREV	CHROMIUM	REC	94	1		%	++	0.0005	0.002			
SREV	COBALT	FOUND	0.096249	1		mg/L	++	0.00005	0.0003			
SREV	COBALT	REC	96	1		%	++	0.00005	0.0003			
SREV	COPPER	FOUND	0.23136	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	92	1		%	++	0.0008	0.002			
SREV	LEAD	FOUND	0.23738	1		mg/L	++	0.0001	0.0005			
SREV	LEAD	REC	95	1		%	++	0.0001	0.0005			
SREV	MANGANESE	FOUND	0.09713	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	97	1		%	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND	0.09399	1		mg/L	++	0.0002	0.0005			
SREV	MOLYBDENUM	REC	94	1		%	++	0.0002	0.0005			
SREV	NICKEL	FOUND	0.23562	1		mg/L	++	0.0004	0.001			
SREV	NICKEL	REC	94	1		%	++	0.0004	0.001			
SREV	SELENIUM	FOUND	0.23335	1		mg/L	++	0.0001	0.0003			
SREV	SELENIUM	REC	93	1		%	++	0.0001	0.0003			
SREV	SILVER	FOUND	0.02386	1		mg/L	++	0.0001	0.0005			
SREV	SILVER	REC	95	1		%	++	0.0001	0.0005			
SREV	THALLIUM	FOUND	0.0947	1		mg/L	++	0.0001	0.0005			
SREV	THALLIUM	REC	95	1		%	++	0.0001	0.0005			
SREV	THORIUM	FOUND	0.0948	1		mg/L	++	0.001	0.005			
SREV	THORIUM	REC	95	1		%	++	0.001	0.005			
SREV	URANIUM	FOUND	0.0956	1		mg/L	++	0.0001	0.0005			
SREV	URANIUM	REC	96	1		%	++	0.0001	0.0005			
SREV	VANADIUM	FOUND	0.09373	1		mg/L	++	0.0005	0.002			
SREV	VANADIUM	REC	94	1		%	++	0.0005	0.002			
SREV	ZINC	FOUND	0.485	1		mg/L	++	0.004	0.01			
SREV	ZINC	REC	97	1		%	++	0.004	0.01			

WG489196CCB2

Tag:

Measured: 1/2/2020 1:17:39 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	ARSENIC	FOUND		1	U	mg/L	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND		1	U	mg/L	++	0.00008	0.0003			
SREV	CADMIUM	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	COBALT	FOUND		1	U	mg/L	++	0.00005	0.0003			
SREV	COPPER	FOUND	0.00181 ✓	1	B	mg/L	++	0.0008	0.002	5x = 0.00905		
SREV	LEAD	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND		1	U	mg/L	++	0.0002	0.0005			
SREV	NICKEL	FOUND		1	U	mg/L	++	0.0004	0.001			
SREV	SELENIUM	FOUND	0.00014 ✓	1	B	mg/L	++	0.0001	0.0003	5x = 0.0007		
SREV	SILVER	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	THALLIUM	FOUND		1	U	mg/L	++	0.0001	0.0005	Se in all samples is above the limit; copper is not reported from this sequence		
SREV	THORIUM	FOUND		1	U	mg/L	++	0.001	0.005			
SREV	URANIUM	FOUND		1	U	mg/L	++	0.0001	0.0005			
SREV	VANADIUM	FOUND		1	U	mg/L	++	0.0005	0.002			
SREV	ZINC	FOUND		1	U	mg/L	++	0.004	0.01			

L56453-01

Tag:

Measured: 1/2/2020 1:19:25 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	IS-MWMT		5	U	mg/L	++	0.002	0.01			
SREV	ARSENIC	IS-MWMT	.005	5		mg/L	++	0.001	0.005		ZG	
SREV	BERYLLIUM	IS-MWMT	.0042	5		mg/L	++	0.0004	0.001			
SREV	CADMIUM	IS-MWMT	.0033	5		mg/L	++	0.0003	0.001			
SREV	CHROMIUM	IS-MWMT		5	U	mg/L	++	0.003	0.01			
SREV	COBALT	IS-MWMT	.390	5		mg/L	++	0.0003	0.001			
REDO	COPPER	REG	463	5	O	mg/L	OCAL	0.004	0.01			
SREV	LEAD	IS-MWMT	.0007	5	B	mg/L	++	0.0005	0.003			
SREV	MANGANESE	IS-MWMT	3.24	5		mg/L	++	0.002	0.01			
SREV	MOLYBDENUM	IS-MWMT		5	U	mg/L	++	0.001	0.003		TA	
SREV	NICKEL	IS-MWMT	.313	5		mg/L	++	0.002	0.005			
SREV	SELENIUM	IS-MWMT	.0182	5		mg/L	++	0.0005	0.001		TA	
SREV	SILVER	IS-MWMT		5	U	mg/L	++	0.0005	0.003			
SREV	THALLIUM	IS-MWMT	.0006	5	B	mg/L	++	0.0005	0.003			
SREV	THORIUM	IS-MWMT		5	U	mg/L	++	0.005	0.03		TA TB	
SREV	URANIUM	IS-MWMT	.0332	5		mg/L	++	0.0005	0.003		TA	
SREV	VANADIUM	IS-MWMT		5	U	mg/L	++	0.003	0.01			
SREV	ZINC	IS-MWMT	.54	5		mg/L	++	0.02	0.05			

WG489196ULRV

Tag:

Measured: 1/2/2020 1:39:05 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	0.25926	1		mg/L	++	0.0004	0.002			
SREV	ANTIMONY	REC	104	1		%	++	0.0004	0.002			
SREV	ARSENIC	FOUND	2.0407	1		mg/L	++	0.0002	0.001			
SREV	ARSENIC	REC	102	1		%	++	0.0002	0.001			
SREV	BERYLLIUM	FOUND	1.956609	1		mg/L	++	0.00008	0.0003			
SREV	BERYLLIUM	REC	98	1		%	++	0.00008	0.0003			
SREV	CADMIUM	FOUND	1.989778	1		mg/L	++	0.00005	0.0003			
SREV	CADMIUM	REC	99	1		%	++	0.00005	0.0003			
SREV	CHROMIUM	FOUND	2.05124	1		mg/L	++	0.0005	0.002			
SREV	CHROMIUM	REC	102	1		%	++	0.0005	0.002			
SREV	COBALT	FOUND	1.892114	1		mg/L	++	0.00005	0.0003			
SREV	COBALT	REC	95	1		%	++	0.00005	0.0003			
SREV	COPPER	FOUND	4.86438	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	97	1		%	++	0.0008	0.002			
SREV	LEAD	FOUND	4.71131	1		mg/L	++	0.0001	0.0005			
SREV	LEAD	REC	94	1		%	++	0.0001	0.0005			
SREV	MANGANESE	FOUND	1.89765	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	95	1		%	++	0.0004	0.002			
SREV	MOLYBDENUM	FOUND	1.97418	1		mg/L	++	0.0002	0.0005			
SREV	MOLYBDENUM	REC	99	1		%	++	0.0002	0.0005			
SREV	NICKEL	FOUND	5.17461	1		mg/L	++	0.0004	0.001			
SREV	NICKEL	REC	103	1		%	++	0.0004	0.001			
FAIL	SELENIUM	FOUND	5.56228	1		mg/L	++	0.0001	0.0003			
FAIL	SELENIUM	REC	111	1		%	ALRT	0.0001	0.0003	all samples are well below the edge of the linear range; no qualification		
FAIL	SILVER	FOUND	0.40676	1		mg/L	++	0.0001	0.0005			
FAIL	SILVER	REC	81	1		%	ALRT	0.0001	0.0005			
SREV	THALLIUM	FOUND	1.8793	1		mg/L	++	0.0001	0.0005			
SREV	THALLIUM	REC	94	1		%	++	0.0001	0.0005			
SREV	THORIUM	FOUND	1.9612	1		mg/L	++	0.001	0.005			
SREV	THORIUM	REC	98	1		%	++	0.001	0.005			
SREV	URANIUM	FOUND	1.91345	1		mg/L	++	0.0001	0.0005			
SREV	URANIUM	REC	96	1		%	++	0.0001	0.0005			
SREV	VANADIUM	FOUND	2.1116	1		mg/L	++	0.0005	0.002			
SREV	VANADIUM	REC	106	1		%	++	0.0005	0.002			
SREV	ZINC	FOUND	10.0075	1		mg/L	++	0.004	0.01			
SREV	ZINC	REC	100	1		%	++	0.004	0.01			

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Sample Summary

Index	20
Label	WG488184PBS
Start Time	1/2/2020 12:45:34 PM
Dilution Factor	1
Rack	3
Vial	6

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	0.011 ppb	32.4 %	417 cps
11B (STD)	231.307 ppb	1.9 %	**2,005,300 cps**
27Al (STD)	3.356 ppb	1.5 %	**169,281 cps**
51V (KED)	0.046 ppb	10.4 %	830 cps
52Cr (KED)	0.263 ppb	6.3 %	1,250 cps
55Mn (STD)	0.150 ppb	7.7 %	33,898 cps
56Fe (KEDH)	2.918 ppb	2.0 %	98,171 cps
59Co (STD)	0.020 ppb	5.9 %	2,037 cps
60Ni (KED)	0.124 ppb	17.5 %	471 cps
63Cu (KED)	0.489 ppb	1.4 %	3,833 cps
66Zn (STD)	0.664 ppb	2.3 %	9,487 cps
75As (KED)	0.130 ppb	58.8 %	74 cps
78Se (KEDH)	0.036 ppb	27.2 %	63 cps
98Mo (STD)	0.029 ppb	9.1 %	1,672 cps
107Ag (STD)	0.004 ppb	14.1 %	287 cps
111Cd (STD)	0.012 ppb	45.2 %	172 cps
118Sn (STD)	0.049 ppb	8.8 %	7,754 cps
121Sb (STD)	0.009 ppb	21.5 %	1,600 cps
125Te (STD)	0.091 ppb	16.8 %	214 cps
133Cs (STD)	0.022 ppb	4.0 %	3,928 cps
137Ba (STD)	0.955 ppb	2.1 %	18,044 cps
205Tl (STD)	0.016 ppb	18.9 %	2,138 cps
208Pb (STD)	0.041 ppb	5.0 %	6,298 cps
232Th (STD)	0.255 ppb	5.8 %	43,902 cps
238U (STD)	0.010 ppb	21.9 %	3,011 cps

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	97.909 %	0.2 %	398,834 cps
45Sc (STD)	103.351 %	0.3 %	1,985,486 cps
45Sc (KED)	103.754 %	1.7 %	16,173 cps
45Sc (KEDH)	103.945 %	2.5 %	364,786 cps
72Ge (STD)	102.173 %	0.5 %	372,437 cps
72Ge (KED)	100.992 %	0.6 %	15,630 cps
72Ge (KEDH)	103.510 %	4.8 %	167,477 cps
115In (STD)	99.767 %	0.9 %	1,622,583 cps
115In (KED)	103.654 %	2.9 %	139,887 cps
115In (KEDH)	102.646 %	5.6 %	1,092,444 cps
159Tb (STD)	100.623 %	0.7 %	2,098,101 cps
209Bi (STD)	98.715 %	0.3 %	2,526,328 cps

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Sample Summary

Index	21
Label	L56331-01
Start Time	1/2/2020 12:47:21 PM
Dilution Factor	5
Rack	3
Vial	7

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	3.391 ppb	2.0 %	5,574 cps
11B (STD)	171.968 ppb	1.2 %	336,735 cps
27Al (STD)	26,811.035 ppb	0.9 %	**244,489,585 cps**
51V (KED)	-0.383 ppb	3.2 %	452 cps
52Cr (KED)	1.694 ppb	11.1 %	1,405 cps
55Mn (STD)	6,248.266 ppb	0.2 %	**128,524,366 cps**
56Fe (KEDH)	5,720.673 ppb	1.8 %	**29,352,002 cps**
59Co (STD)	469.393 ppb	0.4 %	**7,059,808 cps**
60Ni (KED)	401.891 ppb	1.2 %	165,082 cps
63Cu (KED)	467,130.691 ppb	1.1 %	**547,435,894 cps**
66Zn (STD)	1,433.642 ppb	1.2 %	**2,711,488 cps**
75As (KED)	4.844 ppb	11.0 %	400 cps
78Se (KEDH)	25.832 ppb	5.2 %	4,675 cps
98Mo (STD)	0.120 ppb	11.6 %	1,445 cps
107Ag (STD)	0.011 ppb	13.1 %	186 cps
111Cd (STD)	8.908 ppb	2.2 %	19,301 cps
118Sn (STD)	0.101 ppb	12.6 %	6,474 cps
121Sb (STD)	1.027 ppb	1.0 %	8,128 cps
125Te (STD)	0.217 ppb	13.1 %	117 cps
133Cs (STD)	0.607 ppb	1.7 %	18,349 cps
137Ba (STD)	25.225 ppb	1.2 %	90,426 cps
205Tl (STD)	2.869 ppb	0.8 %	53,652 cps
208Pb (STD)	0.431 ppb	0.9 %	11,302 cps
232Th (STD)	0.263 ppb	10.9 %	13,268 cps
238U (STD)	32.176 ppb	0.8 %	859,196 cps

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	105.896 %	0.9 %	431,370 cps
45Sc (STD)	103.760 %	0.3 %	1,993,356 cps
45Sc (KED)	95.090 %	1.5 %	14,822 cps
45Sc (KEDH)	110.582 %	3.7 %	388,078 cps
72Ge (STD)	103.047 %	0.3 %	375,625 cps
72Ge (KED)	96.320 %	1.5 %	14,907 cps
72Ge (KEDH)	95.786 %	5.3 %	154,980 cps
115In (STD)	95.827 %	1.4 %	1,558,495 cps
115In (KED)	89.546 %	0.8 %	120,847 cps
115In (KEDH)	95.062 %	5.0 %	1,011,729 cps
159Tb (STD)	105.603 %	1.0 %	2,201,948 cps
209Bi (STD)	90.051 %	0.7 %	2,304,597 cps

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Sample Summary

Index	22
Label	L56331-02
Start Time	1/2/2020 12:49:08 PM
Dilution Factor	2
Rack	3
Vial	8

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	1.763 ppb	0.6 %	7,756 cps
11B (STD)	148.871 ppb	0.7 %	787,916 cps
27Al (STD)	4,675.718 ppb	0.2 %	**108,767,038 cps**
51V (KED)	-0.166 ppb	5.0 %	449 cps
52Cr (KED)	0.158 ppb	13.4 %	533 cps
55Mn (STD)	8,811.975 ppb	0.7 %	**491,779,402 cps**
56Fe (KEDH)	22.727 ppb	2.6 %	321,953 cps
59Co (STD)	440.251 ppb	0.4 %	**17,965,716 cps**
60Ni (KED)	232.521 ppb	1.2 %	245,901 cps
63Cu (KED)	52,574.867 ppb	1.1 %	**158,681,703 cps**
66Zn (STD)	450.968 ppb	0.9 %	2,315,117 cps
75As (KED)	1.604 ppb	3.9 %	344 cps
78Se (KEDH)	51.835 ppb	2.2 %	24,443 cps
98Mo (STD)	1.169 ppb	2.1 %	18,612 cps
107Ag (STD)	0.012 ppb	18.2 %	392 cps
111Cd (STD)	5.181 ppb	1.4 %	28,342 cps
118Sn (STD)	0.158 ppb	11.2 %	8,577 cps
121Sb (STD)	0.278 ppb	1.4 %	5,959 cps
125Te (STD)	0.279 ppb	6.4 %	299 cps
133Cs (STD)	0.882 ppb	0.3 %	65,782 cps
137Ba (STD)	16.198 ppb	0.4 %	146,508 cps
205Tl (STD)	0.682 ppb	1.0 %	30,115 cps
208Pb (STD)	1.278 ppb	1.5 %	74,574 cps
232Th (STD)	0.015 ppb	57.4 %	6,827 cps
238U (STD)	24.255 ppb	1.1 %	1,518,024 cps

Internal Standards	Concentration average	Concentration RSD	Intensity average	
6Li (STD)	117.633 %	0.3 %	479,180 cps	
45Sc (STD)	112.616 %	0.3 %	**2,163,488 cps**	
45Sc (KED)	97.952 %	0.4 %	15,268 cps	
45Sc (KEDH)	136.482 %	3.4 %	478,969 cps	IS is not associated with project analytes
72Ge (STD)	105.136 %	0.4 %	383,240 cps	
72Ge (KED)	92.949 %	0.6 %	14,385 cps	
72Ge (KEDH)	100.349 %	3.1 %	162,363 cps	
115In (STD)	96.822 %	1.2 %	1,574,685 cps	
115In (KED)	86.171 %	1.3 %	116,292 cps	
115In (KEDH)	99.142 %	5.3 %	1,055,145 cps	
159Tb (STD)	102.856 %	0.9 %	2,144,662 cps	
209Bi (STD)	84.489 %	1.0 %	2,162,271 cps	

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Sample Summary

Index	23
Label	L56331-03
Start Time	1/2/2020 12:50:55 PM
Dilution Factor	2
Rack	3
Vial	9

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	0.814 ppb	0.5 %	3,803 cps
11B (STD)	116.881 ppb	0.3 %	563,495 cps
27Al (STD)	3,491.188 ppb	0.0 %	**80,308,837 cps**
51V (KED)	-0.057 ppb	50.5 %	590 cps
52Cr (KED)	0.717 ppb	9.9 %	1,516 cps
55Mn (STD)	1,053.291 ppb	1.2 %	**59,254,170 cps**
56Fe (KEDH)	62.263 ppb	1.5 %	865,198 cps
59Co (STD)	76.210 ppb	0.6 %	**3,134,715 cps**
60Ni (KED)	84.034 ppb	0.6 %	88,935 cps
63Cu (KED)	60,541.960 ppb	0.9 %	**182,618,195 cps**
66Zn (STD)	240.184 ppb	1.3 %	1,244,190 cps
75As (KED)	1.812 ppb	9.5 %	387 cps
78Se (KEDH)	2.619 ppb	4.8 %	1,281 cps
98Mo (STD)	0.322 ppb	2.2 %	5,680 cps
107Ag (STD)	0.034 ppb	9.8 %	1,020 cps
111Cd (STD)	1.599 ppb	1.6 %	8,827 cps
118Sn (STD)	0.033 ppb	23.8 %	6,456 cps
121Sb (STD)	0.865 ppb	1.1 %	16,006 cps
125Te (STD)	0.154 ppb	10.5 %	182 cps
133Cs (STD)	1.018 ppb	0.9 %	76,325 cps
137Ba (STD)	16.664 ppb	0.3 %	151,660 cps
205Tl (STD)	0.520 ppb	3.2 %	23,922 cps
208Pb (STD)	0.436 ppb	1.5 %	26,797 cps
232Th (STD)	-0.044 ppb	3.5 %	3,319 cps
238U (STD)	3.951 ppb	2.4 %	257,379 cps

Internal Standards	Concentration average	Concentration RSD	Intensity average	
6Li (STD)	106.465 %	0.2 %	433,686 cps	
45Sc (STD)	113.496 %	1.0 %	**2,180,395 cps**	
45Sc (KED)	97.895 %	0.8 %	15,259 cps	
45Sc (KEDH)	138.046 %	3.9 %	484,460 cps	IS is not associated with project analytes
72Ge (STD)	103.962 %	0.3 %	378,957 cps	
72Ge (KED)	96.061 %	0.4 %	14,867 cps	
72Ge (KEDH)	101.782 %	5.2 %	164,681 cps	
115In (STD)	97.432 %	1.0 %	1,584,610 cps	
115In (KED)	89.364 %	1.0 %	120,601 cps	
115In (KEDH)	101.841 %	5.3 %	1,083,869 cps	
159Tb (STD)	105.611 %	0.7 %	2,202,112 cps	
209Bi (STD)	87.541 %	0.2 %	2,240,373 cps	

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Sample Summary

Index	24
Label	L56331-04
Start Time	1/2/2020 12:52:42 PM
Dilution Factor	2
Rack	3
Vial	10

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	4.948 ppb	1.3 %	20,919 cps
11B (STD)	149.899 ppb	1.1 %	906,432 cps
27Al (STD)	12,746.132 ppb	0.5 %	**296,320,721 cps**
51V (KED)	-0.162 ppb	3.9 %	455 cps
52Cr (KED)	0.121 ppb	6.7 %	468 cps
55Mn (STD)	13,789.737 ppb	1.1 %	**762,629,336 cps**
56Fe (KEDH)	27.917 ppb	1.7 %	383,661 cps
59Co (STD)	689.847 ppb	0.8 %	**27,897,425 cps**
60Ni (KED)	394.552 ppb	2.7 %	417,216 cps
63Cu (KED)	72,700.798 ppb	2.7 %	**219,476,817 cps**
66Zn (STD)	539.565 ppb	3.1 %	**2,744,236 cps**
75As (KED)	2.517 ppb	10.8 %	530 cps
78Se (KEDH)	103.910 ppb	2.0 %	47,970 cps
98Mo (STD)	1.061 ppb	1.2 %	16,775 cps
107Ag (STD)	0.010 ppb	12.6 %	356 cps
111Cd (STD)	5.889 ppb	1.3 %	31,845 cps
118Sn (STD)	0.155 ppb	6.1 %	8,421 cps
121Sb (STD)	0.233 ppb	4.1 %	5,133 cps
125Te (STD)	0.296 ppb	10.1 %	311 cps
133Cs (STD)	0.601 ppb	2.6 %	44,501 cps
137Ba (STD)	17.204 ppb	0.7 %	153,809 cps
205Tl (STD)	0.311 ppb	1.8 %	13,927 cps
208Pb (STD)	0.379 ppb	0.4 %	22,432 cps
232Th (STD)	-0.001 ppb	280.0 %	5,800 cps
238U (STD)	38.201 ppb	0.3 %	2,375,605 cps

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	134.419 %	0.4 %	547,560 cps
45Sc (STD)	111.603 %	0.5 %	**2,144,034 cps**
45Sc (KED)	98.009 %	2.3 %	15,277 cps
45Sc (KEDH)	130.230 %	2.7 %	457,030 cps
72Ge (STD)	105.083 %	0.4 %	383,046 cps
72Ge (KED)	95.759 %	2.1 %	14,820 cps
72Ge (KEDH)	98.296 %	4.6 %	159,041 cps
115In (STD)	95.716 %	0.7 %	1,556,699 cps
115In (KED)	85.175 %	1.4 %	114,949 cps
115In (KEDH)	97.028 %	4.3 %	1,032,648 cps
159Tb (STD)	102.728 %	0.4 %	2,141,987 cps
209Bi (STD)	83.980 %	0.9 %	2,149,240 cps

IS is not associated with project analytes

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Sample Summary

Index	27
Label	L56331-05
Start Time	1/2/2020 12:58:00 PM
Dilution Factor	2
Rack	3
Vial	11

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	6.983 ppb	2.2 %	28,945 cps
11B (STD)	75.447 ppb	1.0 %	533,137 cps
27Al (STD)	23,359.094 ppb	0.7 %	**543,567,310 cps**
51V (KED)	-0.177 ppb	13.2 %	433 cps
52Cr (KED)	1.090 ppb	2.4 %	2,165 cps
55Mn (STD)	4,493.096 ppb	1.5 %	**244,864,431 cps**
56Fe (KEDH)	195.396 ppb	1.2 %	**2,582,490 cps**
59Co (STD)	511.353 ppb	1.6 %	**20,376,218 cps**
60Ni (KED)	314.162 ppb	1.3 %	330,707 cps
63Cu (KED)	150,182.243 ppb	0.8 %	**451,286,741 cps**
66Zn (STD)	503.256 ppb	1.4 %	2,522,362 cps
75As (KED)	4.755 ppb	6.3 %	982 cps
78Se (KEDH)	19.174 ppb	2.7 %	8,870 cps
98Mo (STD)	0.081 ppb	1.7 %	1,938 cps
107Ag (STD)	0.014 ppb	0.7 %	459 cps
111Cd (STD)	3.577 ppb	1.1 %	19,377 cps
118Sn (STD)	-0.017 ppb	38.3 %	5,496 cps
121Sb (STD)	0.164 ppb	6.3 %	3,985 cps
125Te (STD)	0.127 ppb	10.8 %	154 cps
133Cs (STD)	0.630 ppb	1.7 %	46,637 cps
137Ba (STD)	13.739 ppb	2.3 %	123,020 cps
205Tl (STD)	0.302 ppb	3.0 %	13,561 cps
208Pb (STD)	0.707 ppb	1.6 %	41,430 cps
232Th (STD)	0.235 ppb	4.3 %	20,477 cps
238U (STD)	50.483 ppb	0.7 %	**3,150,674 cps**

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	153.531 %	0.5 %	625,413 cps
45Sc (STD)	109.982 %	1.5 %	**2,112,892 cps**
45Sc (KED)	97.523 %	0.9 %	15,202 cps
45Sc (KEDH)	131.472 %	3.9 %	461,389 cps
72Ge (STD)	105.187 %	0.3 %	383,423 cps
72Ge (KED)	100.956 %	1.8 %	15,624 cps
72Ge (KEDH)	98.186 %	5.5 %	158,864 cps
115In (STD)	95.828 %	0.3 %	1,558,523 cps
115In (KED)	86.291 %	0.3 %	116,454 cps
115In (KEDH)	96.537 %	5.2 %	1,027,422 cps
159Tb (STD)	113.485 %	0.7 %	2,366,295 cps
209Bi (STD)	84.294 %	0.5 %	2,157,274 cps

IS is not associated with project analytes

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Sample Summary

Index	28
Label	L56331-05MS1
Start Time	1/2/2020 12:59:47 PM
Dilution Factor	2
Rack	3
Vial	12

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	49.003 ppb	2.1 %	198,714 cps
11B (STD)	81.267 ppb	0.7 %	564,671 cps
27Al (STD)	22,922.667 ppb	2.1 %	**532,148,941 cps**
51V (KED)	46.160 ppb	1.3 %	59,874 cps
52Cr (KED)	45.521 ppb	1.0 %	79,286 cps
55Mn (STD)	4,483.383 ppb	1.8 %	**241,566,242 cps**
56Fe (KEDH)	230.389 ppb	1.2 %	**3,097,458 cps**
59Co (STD)	546.024 ppb	1.9 %	**21,511,479 cps**
60Ni (KED)	349.128 ppb	1.1 %	363,995 cps
63Cu (KED)	147,969.345 ppb	1.5 %	**440,377,228 cps**
66Zn (STD)	539.738 ppb	1.9 %	**2,674,170 cps**
75As (KED)	49.799 ppb	0.4 %	10,024 cps
78Se (KEDH)	67.100 ppb	1.6 %	31,505 cps
98Mo (STD)	47.342 ppb	1.1 %	714,864 cps
107Ag (STD)	8.893 ppb	1.1 %	242,261 cps
111Cd (STD)	49.869 ppb	1.8 %	268,636 cps
118Sn (STD)	45.622 ppb	1.9 %	780,675 cps
121Sb (STD)	10.272 ppb	2.2 %	172,756 cps
125Te (STD)	46.313 ppb	3.5 %	42,881 cps
133Cs (STD)	46.632 ppb	2.5 %	**3,395,776 cps**
137Ba (STD)	61.190 ppb	2.6 %	544,738 cps
205Tl (STD)	51.332 ppb	1.0 %	2,236,317 cps
208Pb (STD)	50.420 ppb	1.1 %	2,924,234 cps
232Th (STD)	52.517 ppb	0.8 %	**3,270,486 cps**
238U (STD)	100.700 ppb	1.5 %	**6,313,361 cps**

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	151.457 %	0.7 %	616,962 cps
45Sc (STD)	108.727 %	0.8 %	**2,088,783 cps**
45Sc (KED)	96.596 %	1.3 %	15,057 cps
45Sc (KEDH)	130.996 %	4.0 %	459,719 cps
72Ge (STD)	104.947 %	0.6 %	382,549 cps
72Ge (KED)	102.415 %	0.7 %	15,850 cps
72Ge (KEDH)	99.927 %	4.9 %	161,680 cps
115In (STD)	95.429 %	0.2 %	1,552,029 cps
115In (KED)	86.791 %	0.6 %	117,129 cps
115In (KEDH)	98.244 %	5.0 %	1,045,590 cps
159Tb (STD)	114.463 %	1.2 %	2,386,691 cps
209Bi (STD)	84.692 %	0.4 %	2,167,466 cps

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Sample Summary

Index	29
Label	L56331-05MSD1
Start Time	1/2/2020 1:01:34 PM
Dilution Factor	2
Rack	3
Vial	13

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	49.511 ppb	0.5 %	201,363 cps
11B (STD)	82.350 ppb	0.9 %	570,134 cps
27Al (STD)	23,198.834 ppb	1.3 %	**539,822,273 cps**
51V (KED)	48.630 ppb	0.8 %	61,541 cps
52Cr (KED)	47.953 ppb	0.2 %	81,513 cps
55Mn (STD)	4,552.767 ppb	0.8 %	**246,011,698 cps**
56Fe (KEDH)	242.689 ppb	1.4 %	**3,269,866 cps**
59Co (STD)	549.906 ppb	0.9 %	**21,727,292 cps**
60Ni (KED)	368.685 ppb	0.5 %	375,206 cps
63Cu (KED)	155,179.322 ppb	0.7 %	**450,825,177 cps**
66Zn (STD)	549.934 ppb	0.8 %	2,732,634 cps
75As (KED)	52.331 ppb	0.9 %	10,281 cps
78Se (KEDH)	70.326 ppb	2.8 %	33,102 cps
98Mo (STD)	48.915 ppb	1.2 %	734,000 cps
107Ag (STD)	9.124 ppb	0.5 %	247,015 cps
111Cd (STD)	51.083 ppb	0.5 %	273,473 cps
118Sn (STD)	46.888 ppb	1.1 %	797,201 cps
121Sb (STD)	10.593 ppb	0.6 %	176,994 cps
125Te (STD)	47.383 ppb	0.9 %	43,598 cps
133Cs (STD)	47.875 ppb	0.7 %	**3,464,610 cps**
137Ba (STD)	62.782 ppb	1.3 %	555,430 cps
205Tl (STD)	52.347 ppb	1.5 %	2,278,522 cps
208Pb (STD)	51.378 ppb	1.2 %	2,977,127 cps
232Th (STD)	53.591 ppb	0.5 %	**3,334,219 cps**
238U (STD)	102.321 ppb	0.5 %	**6,409,026 cps**

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	150.997 %	0.5 %	615,091 cps
45Sc (STD)	109.038 %	0.4 %	2,094,743 cps
45Sc (KED)	94.284 %	0.7 %	14,697 cps
45Sc (KEDH)	132.273 %	3.2 %	464,198 cps
72Ge (STD)	105.189 %	0.6 %	383,432 cps
72Ge (KED)	102.537 %	2.9 %	15,869 cps
72Ge (KEDH)	100.165 %	3.8 %	162,065 cps
115In (STD)	94.837 %	0.7 %	1,542,396 cps
115In (KED)	86.149 %	1.3 %	116,263 cps
115In (KEDH)	98.756 %	4.6 %	1,051,043 cps
159Tb (STD)	113.114 %	0.8 %	2,358,550 cps
209Bi (STD)	84.617 %	0.6 %	2,165,529 cps

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Sample Summary

Index	30
Label	L56331-06
Start Time	1/2/2020 1:03:22 PM
Dilution Factor	1
Rack	3
Vial	14

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	-0.002 ppb	108.9 %	337 cps
11B (STD)	130.898 ppb	0.1 %	1,281,552 cps
27Al (STD)	7.002 ppb	3.7 %	330,775 cps
51V (KED)	0.035 ppb	20.1 %	771 cps
52Cr (KED)	0.166 ppb	10.4 %	856 cps
55Mn (STD)	620.344 ppb	2.2 %	**68,227,158 cps**
56Fe (KEDH)	3.781 ppb	0.7 %	119,087 cps
59Co (STD)	3.826 ppb	2.7 %	308,160 cps
60Ni (KED)	2.992 ppb	1.6 %	6,626 cps
63Cu (KED)	37.706 ppb	0.9 %	232,482 cps
66Zn (STD)	1.252 ppb	3.2 %	16,123 cps
75As (KED)	0.895 ppb	6.6 %	389 cps
78Se (KEDH)	26.047 ppb	1.9 %	24,736 cps
98Mo (STD)	55.577 ppb	1.3 %	1,673,452 cps
107Ag (STD)	0.003 ppb	22.8 %	229 cps
111Cd (STD)	0.083 ppb	12.7 %	919 cps
118Sn (STD)	0.062 ppb	7.9 %	7,867 cps
121Sb (STD)	1.022 ppb	0.6 %	35,284 cps
125Te (STD)	0.198 ppb	12.5 %	401 cps
133Cs (STD)	0.333 ppb	1.0 %	48,948 cps
137Ba (STD)	15.895 ppb	0.9 %	282,460 cps
205Tl (STD)	0.084 ppb	0.6 %	7,782 cps
208Pb (STD)	0.048 ppb	0.9 %	6,257 cps
232Th (STD)	0.176 ppb	2.4 %	27,937 cps
238U (STD)	103.443 ppb	1.5 %	**13,009,515 cps**

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	109.918 %	0.4 %	447,752 cps
45Sc (STD)	110.972 %	2.0 %	**2,131,903 cps**
45Sc (KED)	99.750 %	2.9 %	15,549 cps
45Sc (KEDH)	131.518 %	3.7 %	461,550 cps
72Ge (STD)	101.161 %	0.5 %	368,749 cps
72Ge (KED)	92.711 %	0.4 %	14,348 cps
72Ge (KEDH)	101.037 %	4.5 %	163,476 cps
115In (STD)	95.201 %	0.5 %	1,548,316 cps
115In (KED)	88.958 %	1.8 %	120,054 cps
115In (KEDH)	100.882 %	4.8 %	1,073,666 cps
159Tb (STD)	99.473 %	0.9 %	2,074,133 cps
209Bi (STD)	84.958 %	0.2 %	2,174,262 cps

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Sample Summary

Index	31
Label	L56331-06SDL
Start Time	1/2/2020 1:05:09 PM
Dilution Factor	1
Rack	3
Vial	15

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	-0.008 ppb	23.6 %	285 cps
11B (STD)	29.654 ppb	0.8 %	287,675 cps
27Al (STD)	1.827 ppb	2.0 %	101,627 cps
51V (KED)	-0.081 ppb	12.9 %	494 cps
52Cr (KED)	0.032 ppb	13.8 %	400 cps
55Mn (STD)	136.707 ppb	1.5 %	**14,614,705 cps**
56Fe (KEDH)	0.864 ppb	3.4 %	43,076 cps
59Co (STD)	0.843 ppb	1.1 %	66,341 cps
60Ni (KED)	0.649 ppb	3.3 %	1,686 cps
63Cu (KED)	8.372 ppb	1.1 %	55,498 cps
66Zn (STD)	0.141 ppb	11.9 %	4,756 cps
75As (KED)	0.221 ppb	22.6 %	117 cps
78Se (KEDH)	5.041 ppb	4.2 %	5,154 cps
98Mo (STD)	10.679 ppb	0.3 %	346,733 cps
107Ag (STD)	0.000 ppb	41.3 %	88 cps
111Cd (STD)	0.014 ppb	40.8 %	194 cps
118Sn (STD)	-0.015 ppb	23.1 %	5,654 cps
121Sb (STD)	0.193 ppb	2.2 %	8,264 cps
125Te (STD)	0.032 ppb	31.4 %	102 cps
133Cs (STD)	0.065 ppb	3.4 %	10,766 cps
137Ba (STD)	3.148 ppb	1.9 %	60,452 cps
205Tl (STD)	0.014 ppb	5.5 %	1,919 cps
208Pb (STD)	0.022 ppb	1.2 %	3,560 cps
232Th (STD)	-0.016 ppb	13.6 %	4,462 cps
238U (STD)	20.373 ppb	1.4 %	2,886,843 cps

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	104.103 %	0.4 %	424,067 cps
45Sc (STD)	107.733 %	0.7 %	**2,069,684 cps**
45Sc (KED)	106.174 %	1.3 %	16,550 cps
45Sc (KEDH)	114.066 %	2.5 %	400,302 cps
72Ge (STD)	103.669 %	0.4 %	377,890 cps
72Ge (KED)	102.911 %	2.2 %	15,927 cps
72Ge (KEDH)	108.187 %	4.0 %	175,044 cps
115In (STD)	102.474 %	0.2 %	1,666,603 cps
115In (KED)	102.139 %	1.0 %	137,842 cps
115In (KEDH)	106.575 %	5.2 %	1,134,261 cps
159Tb (STD)	102.907 %	0.2 %	2,145,735 cps
209Bi (STD)	95.680 %	0.8 %	2,448,671 cps

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Sample Summary

Index	32
Label	L56331-07
Start Time	1/2/2020 1:06:56 PM
Dilution Factor	2
Rack	3
Vial	16

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	5.166 ppb	0.4 %	21,083 cps
11B (STD)	67.905 ppb	0.5 %	536,908 cps
27Al (STD)	18,700.464 ppb	0.6 %	**425,469,515 cps**
51V (KED)	-0.123 ppb	28.4 %	488 cps
52Cr (KED)	1.000 ppb	7.9 %	1,948 cps
55Mn (STD)	4,486.138 ppb	0.8 %	**239,650,345 cps**
56Fe (KEDH)	129.487 ppb	4.4 %	**1,714,660 cps**
59Co (STD)	492.495 ppb	0.7 %	**19,237,302 cps**
60Ni (KED)	299.647 ppb	2.8 %	306,445 cps
63Cu (KED)	140,952.838 ppb	2.9 %	**411,469,859 cps**
66Zn (STD)	487.419 ppb	0.9 %	2,394,791 cps
75As (KED)	4.346 ppb	4.3 %	873 cps
78Se (KEDH)	17.425 ppb	2.3 %	8,034 cps
98Mo (STD)	0.125 ppb	8.1 %	2,553 cps
107Ag (STD)	0.012 ppb	10.3 %	390 cps
111Cd (STD)	3.307 ppb	0.6 %	17,527 cps
118Sn (STD)	0.020 ppb	70.1 %	6,001 cps
121Sb (STD)	0.132 ppb	7.4 %	3,372 cps
125Te (STD)	0.091 ppb	39.9 %	118 cps
133Cs (STD)	0.466 ppb	3.6 %	33,906 cps
137Ba (STD)	15.988 ppb	1.8 %	140,003 cps
205Tl (STD)	0.269 ppb	2.4 %	12,028 cps
208Pb (STD)	0.472 ppb	1.2 %	27,600 cps
232Th (STD)	0.034 ppb	10.1 %	7,907 cps
238U (STD)	36.091 ppb	1.3 %	2,230,032 cps

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	170.930 %	0.4 %	696,287 cps
45Sc (STD)	107.799 %	0.8 %	**2,070,943 cps**
45Sc (KED)	94.783 %	2.6 %	14,774 cps
45Sc (KEDH)	132.048 %	4.4 %	463,411 cps
72Ge (STD)	102.846 %	0.5 %	374,889 cps
72Ge (KED)	99.238 %	1.7 %	15,358 cps
72Ge (KEDH)	97.919 %	5.6 %	158,431 cps
115In (STD)	93.749 %	0.7 %	1,524,700 cps
115In (KED)	85.234 %	1.9 %	115,028 cps
115In (KEDH)	96.210 %	6.3 %	1,023,940 cps
159Tb (STD)	109.767 %	2.2 %	2,288,761 cps
209Bi (STD)	83.438 %	0.4 %	2,135,356 cps

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Sample Summary

Index	33
Label	L56331-08
Start Time	1/2/2020 1:08:43 PM
Dilution Factor	2
Rack	3
Vial	17

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	2.858 ppb	0.8 %	11,584 cps
11B (STD)	92.006 ppb	0.9 %	495,157 cps
27Al (STD)	15,997.959 ppb	0.4 %	**359,621,566 cps**
51V (KED)	-0.102 ppb	15.0 %	503 cps
52Cr (KED)	1.319 ppb	4.9 %	2,438 cps
55Mn (STD)	1,694.502 ppb	0.8 %	**88,747,648 cps**
56Fe (KEDH)	598.973 ppb	1.3 %	**7,854,392 cps**
59Co (STD)	177.216 ppb	1.4 %	**6,786,038 cps**
60Ni (KED)	181.712 ppb	0.4 %	181,764 cps
63Cu (KED)	167,524.167 ppb	0.2 %	**478,155,840 cps**
66Zn (STD)	429.108 ppb	1.1 %	2,067,124 cps
75As (KED)	4.850 ppb	6.6 %	951 cps
78Se (KEDH)	5.137 ppb	4.8 %	2,388 cps
98Mo (STD)	0.159 ppb	5.0 %	3,012 cps
107Ag (STD)	0.018 ppb	3.0 %	530 cps
111Cd (STD)	2.309 ppb	1.7 %	12,078 cps
118Sn (STD)	8.112 ppb	1.8 %	139,041 cps
121Sb (STD)	0.875 ppb	0.3 %	15,342 cps
125Te (STD)	0.244 ppb	16.1 %	253 cps
133Cs (STD)	0.410 ppb	0.8 %	29,517 cps
137Ba (STD)	35.255 ppb	0.7 %	304,082 cps
205Tl (STD)	0.693 ppb	1.2 %	30,206 cps
208Pb (STD)	0.271 ppb	1.5 %	16,081 cps
232Th (STD)	-0.011 ppb	32.9 %	5,200 cps
238U (STD)	22.804 ppb	1.4 %	1,408,739 cps

Internal Standards	Concentration average	Concentration RSD	Intensity average	
6Li (STD)	117.899 %	0.6 %	480,265 cps	
45Sc (STD)	105.670 %	0.2 %	2,030,043 cps	
45Sc (KED)	92.628 %	1.4 %	14,438 cps	
45Sc (KEDH)	127.658 %	4.8 %	448,005 cps	IS is not associated with project analytes
72Ge (STD)	101.611 %	0.5 %	370,388 cps	
72Ge (KED)	102.128 %	2.6 %	15,806 cps	
72Ge (KEDH)	97.775 %	5.6 %	158,199 cps	
115In (STD)	92.427 %	0.6 %	1,503,197 cps	
115In (KED)	85.165 %	0.6 %	114,935 cps	
115In (KEDH)	96.998 %	5.4 %	1,032,332 cps	
159Tb (STD)	104.228 %	0.4 %	2,173,266 cps	
209Bi (STD)	83.400 %	0.9 %	2,134,399 cps	

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Sample Summary

Index	34
Label	L56331-09
Start Time	1/2/2020 1:10:31 PM
Dilution Factor	5
Rack	3
Vial	18

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	6.673 ppb	0.3 %	10,114 cps
11B (STD)	134.136 ppb	0.3 %	246,283 cps
27Al (STD)	42,522.067 ppb	1.7 %	**370,329,216 cps**
51V (KED)	-0.486 ppb	11.3 %	384 cps
52Cr (KED)	6.227 ppb	2.8 %	4,327 cps
55Mn (STD)	5,024.238 ppb	0.6 %	**98,193,860 cps**
56Fe (KEDH)	3,567.270 ppb	2.0 %	**18,219,512 cps**
59Co (STD)	551.024 ppb	1.1 %	**7,873,788 cps**
60Ni (KED)	396.968 ppb	2.7 %	156,665 cps
63Cu (KED)	517,790.058 ppb	3.0 %	**582,962,375 cps**
66Zn (STD)	1,489.054 ppb	2.4 %	**2,675,491 cps**
75As (KED)	4.858 ppb	6.1 %	386 cps
78Se (KEDH)	18.736 ppb	1.2 %	3,376 cps
98Mo (STD)	0.100 ppb	13.6 %	1,304 cps
107Ag (STD)	0.006 ppb	19.0 %	138 cps
111Cd (STD)	7.572 ppb	1.7 %	16,229 cps
118Sn (STD)	-0.032 ppb	96.9 %	5,505 cps
121Sb (STD)	0.515 ppb	3.9 %	4,640 cps
125Te (STD)	0.108 ppb	48.8 %	76 cps
133Cs (STD)	0.674 ppb	0.9 %	20,084 cps
137Ba (STD)	8.237 ppb	0.8 %	29,375 cps
205Tl (STD)	1.696 ppb	1.2 %	31,602 cps
208Pb (STD)	1.795 ppb	0.7 %	44,506 cps
232Th (STD)	-0.038 ppb	10.3 %	5,267 cps
238U (STD)	132.480 ppb	0.4 %	**3,497,866 cps**

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	97.924 %	0.2 %	398,894 cps
45Sc (STD)	98.585 %	0.6 %	1,893,936 cps
45Sc (KED)	91.400 %	3.1 %	14,247 cps
45Sc (KEDH)	107.426 %	3.5 %	377,001 cps
72Ge (STD)	98.432 %	1.2 %	358,799 cps
72Ge (KED)	94.199 %	0.5 %	14,579 cps
72Ge (KEDH)	95.296 %	5.5 %	154,188 cps
115In (STD)	94.758 %	0.4 %	1,541,118 cps
115In (KED)	89.499 %	2.4 %	120,784 cps
115In (KEDH)	96.761 %	5.9 %	1,029,805 cps
159Tb (STD)	105.890 %	0.3 %	2,207,924 cps
209Bi (STD)	89.154 %	0.1 %	2,281,643 cps

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Sample Summary

Index	35
Label	WG488184LFB2
Start Time	1/2/2020 1:12:18 PM
Dilution Factor	1
Rack	3
Vial	19

Analytes	Concentration average	Concentration RSD	Intensity average
9Be (STD)	43.819 ppb	0.2 %	308,477 cps
11B (STD)	233.220 ppb	0.8 %	**1,812,901 cps**
27Al (STD)	51.299 ppb	0.8 %	**2,164,054 cps**
51V (KED)	47.993 ppb	0.6 %	121,983 cps
52Cr (KED)	47.755 ppb	1.0 %	163,636 cps
55Mn (STD)	46.575 ppb	0.8 %	**4,376,315 cps**
56Fe (KEDH)	50.414 ppb	1.4 %	1,311,600 cps
59Co (STD)	46.200 ppb	0.5 %	**3,162,528 cps**
60Ni (KED)	47.275 ppb	0.3 %	97,263 cps
63Cu (KED)	72.023 ppb	1.8 %	423,138 cps
66Zn (STD)	48.280 ppb	0.9 %	418,019 cps
75As (KED)	49.089 ppb	0.3 %	19,455 cps
78Se (KEDH)	49.424 ppb	1.2 %	44,559 cps
98Mo (STD)	45.329 ppb	1.0 %	1,397,624 cps
107Ag (STD)	9.861 ppb	0.4 %	548,659 cps
111Cd (STD)	47.224 ppb	0.9 %	519,649 cps
118Sn (STD)	46.110 ppb	1.3 %	1,605,828 cps
121Sb (STD)	10.170 ppb	1.3 %	348,163 cps
125Te (STD)	46.621 ppb	1.5 %	88,146 cps
133Cs (STD)	45.543 ppb	1.0 %	**6,774,684 cps**
137Ba (STD)	47.889 ppb	0.8 %	870,776 cps
205Tl (STD)	46.061 ppb	0.1 %	**4,694,061 cps**
208Pb (STD)	47.392 ppb	0.4 %	**6,429,597 cps**
232Th (STD)	47.789 ppb	0.4 %	**6,956,467 cps**
238U (STD)	46.766 ppb	0.5 %	**6,859,386 cps**

Internal Standards	Concentration average	Concentration RSD	Intensity average
6Li (STD)	87.799 %	1.4 %	357,652 cps
45Sc (STD)	94.442 %	0.3 %	1,814,337 cps
45Sc (KED)	95.176 %	1.3 %	14,836 cps
45Sc (KEDH)	94.838 %	4.9 %	332,825 cps
72Ge (STD)	94.629 %	0.2 %	344,939 cps
72Ge (KED)	94.817 %	1.5 %	14,674 cps
72Ge (KEDH)	95.986 %	6.6 %	155,304 cps
115In (STD)	97.476 %	0.5 %	1,585,313 cps
115In (KED)	100.475 %	2.5 %	135,596 cps
115In (KEDH)	99.689 %	6.6 %	1,060,975 cps
159Tb (STD)	99.546 %	0.4 %	2,075,639 cps
209Bi (STD)	99.068 %	0.9 %	2,535,366 cps

ACZ Labs, Inc.
Standards/Reagents Information
ICPMS, Methods 6020 and 200.8

Calibration Standards

6020/200.8 Stock #1: MS191209-1 SCN
6020/200.8 Stock #2: MS191209-2 SCN
6020/200.8 Stock #3: MS191231-1 SCN

PQV STD: MS191231-5
Exp. 1/14/2020

ICPMS5/6 INT STD: MS190612-2
Exp. 1/26/2020

ICPMS7 INT STD: MS190613-1
Exp. 1/26/2020

Nitric Acid: 60325

Hydrochloric Acid: 59570

VERIFIED: MFM 1/2/2020

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LabBook Summary:

LabBook name	WG489196.imexp
Based on Template:	6020_6
Qtegra version (last saved):	2.10.3324.131
LabBook started:	1/2/2020 12:11:47 PM
LabBook finished:	1/2/2020 1:44:31 PM

Performance Report

QTEGRA

System

Start time:	1/2/2020 9:11:28 AM
Instrument:	iCAP RQ
Operator:	LAB\clean
Template:	Daily AMU2
Instrument Serial Number:	RQ00998
Last Autotune:	Autotune-!CaliTune STDS-20191230-092433962.imatdat
Solution:	Custom ACZ 1ppb tune solution

Sensitivity & Stability Test

Result	Runs	Sweeps
Passed	3	60

Sensitivity

Analyte	Result	Value	Condition	Limit
Bkg4.5	Passed	9.8 CPS	Less than	25.0 CPS
Bkg220.7	Passed	10.1 CPS	Less than	25.0 CPS
9Be	Passed	22,012.0 CPS	Greater than	10,000.0 CPS
7Li	Passed	86,930.0 CPS	Greater than	50,000.0 CPS
59Co	Passed	208,895.0 CPS	Greater than	100,000.0 CPS
24Mg	Passed	136,781.0 CPS	Greater than	10,000.0 CPS
238U	Passed	358,608.0 CPS	Greater than	330,000.0 CPS
209Bi	Passed	291,973.0 CPS	Greater than	165,000.0 CPS
208Pb	Passed	187,337.0 CPS	Greater than	10,000.0 CPS
205Tl	Passed	261,516.0 CPS	Greater than	10,000.0 CPS
140Ce.16O/140Ce	Passed	0.0276	Less than	0.03
137Ba++/137Ba	Passed	0.0376	Less than	0.05
115In	Passed	391,215.0 CPS	Greater than	220,000.0 CPS

Stability

Analyte	Value	Limit
9Be	0.1 %	5
7Li	0.2 %	5
59Co	0.6 %	5
24Mg	0.1 %	5
208Pb	0.4 %	5
205Tl	0.4 %	5
115In	0.5 %	5

Mass Calibration Test

Result	Channels	Dwell	MeasureWidth	PointSpacing	Sweeps
Passed	75	0.04	1.5	0.02	5

Analyte	Result	Centroid Mass [u]	Offset	Peak width [u]	Peak width min [u]	Peak width max [u]
7Li	Passed	7.0083	0.0077	0.722	0.650	0.850
9Be	Passed	9.0045	0.0077	0.728	0.650	0.850
24Mg	Passed	23.9849	0.0002	0.714	0.650	0.850
59Co	Passed	58.9429	0.0097	0.706	0.650	0.850
115In	Passed	114.9033	0.0005	0.725	0.650	0.850
205Tl	Passed	204.9819	0.0074	0.746	0.650	0.850
208Pb	Passed	207.9855	0.0088	0.749	0.650	0.850

Tune Settings

Parameter	Value
Additional Gas Flow 1	0.00
Additional Gas Flow 2	0.00
Additional Gas Flow 3	0.00
Angular Deflection	-290.00
Auxilliary Flow	0.80
CCT Bias	-2.00
CCT Entry Lens	-46.00
CCT Exit Lens	-160.00
CCT Focus Lens	1.80
CCT1 Flow	0.00
CCT1 Shut-Off Valve	0.00
CCT2 Flow	0.00
CCT2 Shut-Off Valve	0.00
Cool Flow	14.00
D1 Lens	-210.00
D2 Lens	-80.00
Deflection Entry Lens	-35.00
Dry Pump Speed	0.00
Extraction Lens 1 Negative	0.00
Extraction Lens 1 Polarity	0.00
Extraction Lens 1 Positive	0.00
Extraction Lens 2	-117.33
Focus Lens	21.50
Nebulizer Flow	0.92
Peristaltic Pump Speed	40.00
Plasma Power	1550.00
Pole Bias	-1.00
Quad Entry Lens	-19.60
Sampling Depth	5.00
Spray Chamber Temperature	2.70
Torch Horizontal Position	-0.16
Torch Vertical Position	-0.83
Virtual CCT Mass Maximum Dac Limit Set	4095.00
Virtual CCT Mass parameter b	0.65
Virtual CCT Mass to Dac Factor	130.00
Virtual CCT Mass to Dac Offset	37.50

Vacuum Check

Parameter	Result	Value
Analyzer Pressure	Vacuum ok	2.349e-7
Interface Pressure		1.291e+0

Detector Voltages

Analog	Counting
-2212.50	1587.50

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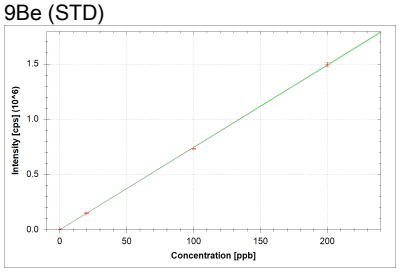
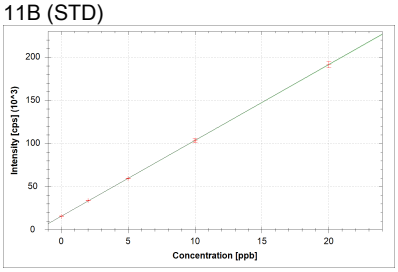
Calibration Curves:

9Be (STD)



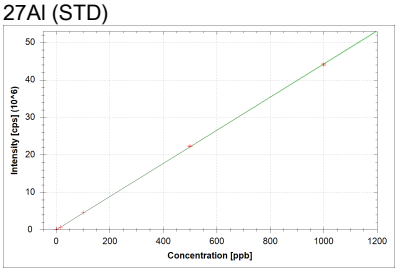
f(x) = 7446.8016*x + 321.4553
R^2 = 0.9999
BEC = 0.043 ppb
LoD = 0.0047 ppb

11B (STD)



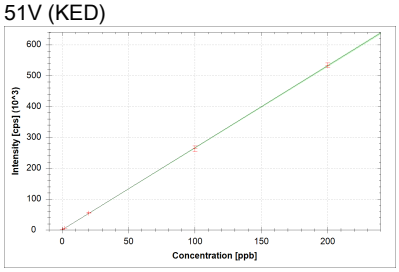
f(x) = 8786.4647*x + 15790.2639
R^2 = 1.0000
BEC = 1.797 ppb
LoD = 0.0283 ppb

27Al (STD)



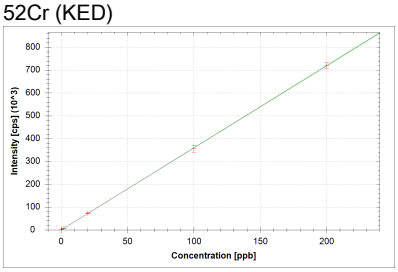
f(x) = 44243.6040*x + 17205.2713
R^2 = 0.9999
BEC = 0.389 ppb
LoD = 0.0092 ppb

51V (KED)



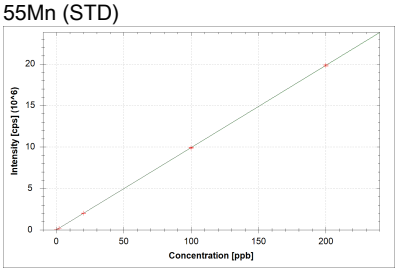
f(x) = 2656.4664*x + 678.7918
R^2 = 0.9999
BEC = 0.256 ppb
LoD = 0.0403 ppb

52Cr (KED)



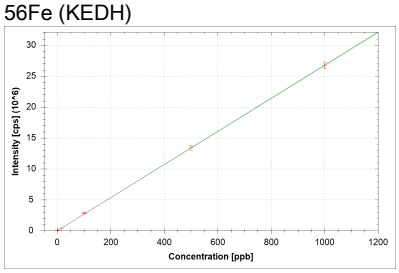
f(x) = 3595.0556*x + 259.9199
R^2 = 0.9999
BEC = 0.072 ppb
LoD = 0.0283 ppb

55Mn (STD)



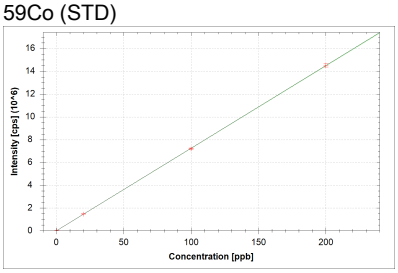
f(x) = 99106.9085*x + 17922.2983
R^2 = 1.0000
BEC = 0.181 ppb
LoD = 0.0079 ppb

56Fe (KEDH)



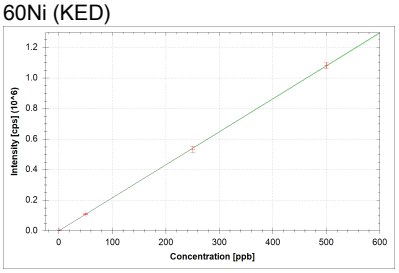
f(x) = 26757.0966*x + 16706.3176
R^2 = 0.9999
BEC = 0.624 ppb
LoD = 0.1591 ppb

59Co (STD)



f(x) = 72470.6458*x + 494.3678
R^2 = 1.0000
BEC = 0.007 ppb
LoD = 0.0011 ppb

60Ni (KED)



f(x) = 2157.7646*x + 187.8618
R^2 = 0.9999
BEC = 0.087 ppb
LoD = 0.0071 ppb

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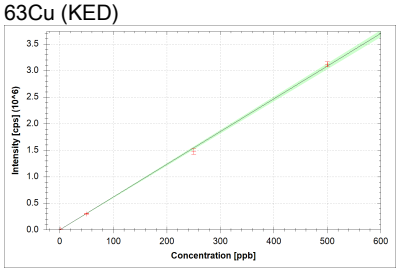
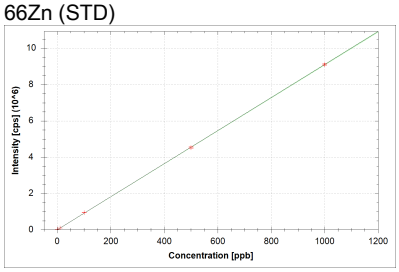
63Cu (KED)



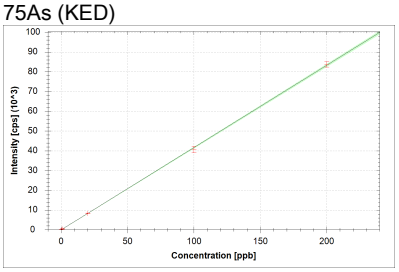
f(x) = 6162.7825*x + 679.7594
R^2 = 0.9992
BEC = 0.110 ppb
LoD = 0.0202 ppb

66Zn (STD)



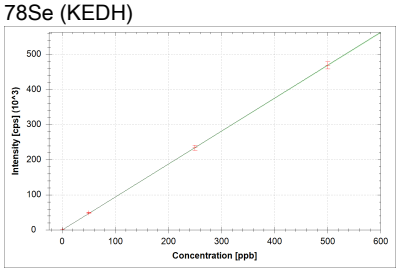
f(x) = 9103.0190*x + 3132.9734
R^2 = 1.0000
BEC = 0.344 ppb
LoD = 0.0664 ppb

75As (KED)



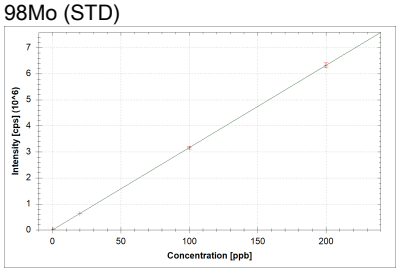
f(x) = 416.0606*x + 17.9255
R^2 = 0.9998
BEC = 0.043 ppb
LoD = 0.0800 ppb

78Se (KEDH)



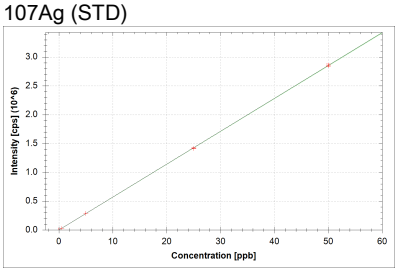
f(x) = 938.4984*x + 27.3415
R^2 = 1.0000
BEC = 0.029 ppb
LoD = 0.0527 ppb

98Mo (STD)



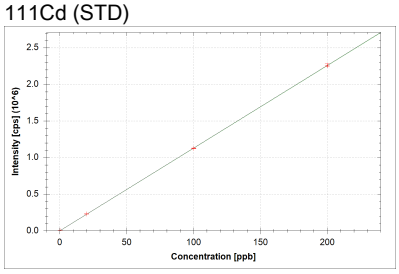
f(x) = 31615.2196*x + 746.4190
R^2 = 1.0000
BEC = 0.024 ppb
LoD = 0.0043 ppb

107Ag (STD)



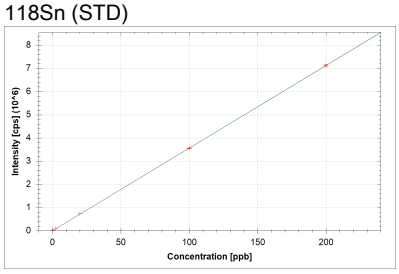
f(x) = 57075.7465*x + 73.3585
R^2 = 1.0000
BEC = 0.001 ppb
LoD = 0.0005 ppb

111Cd (STD)



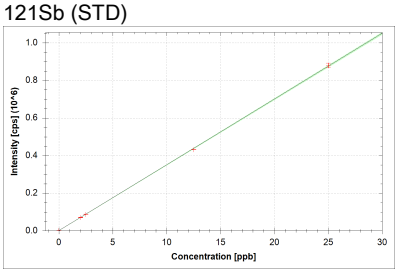
f(x) = 11288.5446*x + 32.7518
R^2 = 1.0000
BEC = 0.003 ppb
LoD = 0.0021 ppb

118Sn (STD)



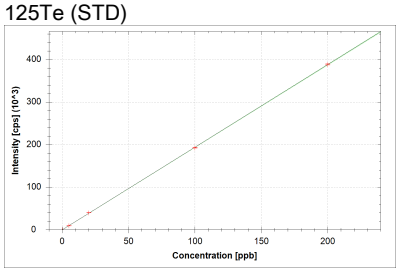
f(x) = 35597.9881*x + 6039.4092
R^2 = 1.0000
BEC = 0.170 ppb
LoD = 0.0301 ppb

121Sb (STD)



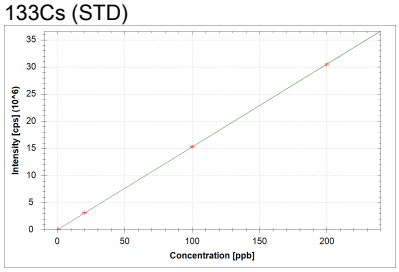
f(x) = 34994.2420*x + 1294.4364
R^2 = 0.9999
BEC = 0.037 ppb
LoD = 0.0068 ppb

125Te (STD)



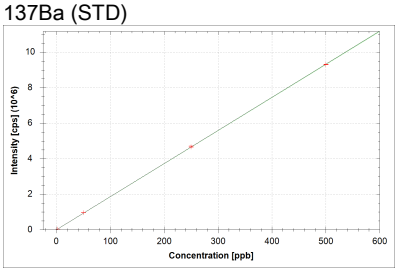
f(x) = 1938.9074*x + 37.7523
R^2 = 1.0000
BEC = 0.019 ppb
LoD = 0.0350 ppb

133Cs (STD)



f(x) = 152593.5361*x + 636.7906
R^2 = 1.0000
BEC = 0.004 ppb
LoD = 0.0008 ppb

137Ba (STD)



f(x) = 18648.9283*x + 275.5343
R^2 = 1.0000
BEC = 0.015 ppb
LoD = 0.0019 ppb

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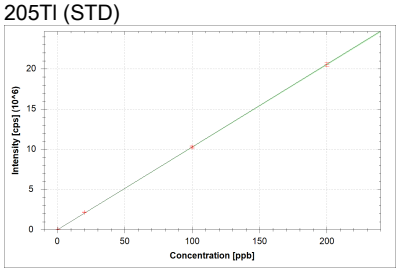
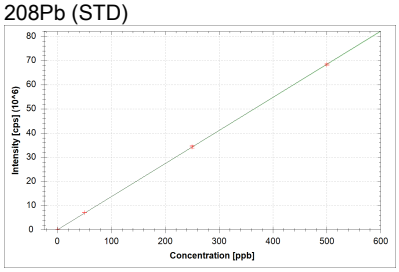
205Tl (STD)



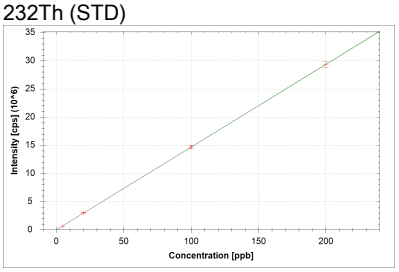
f(x) = 102855.8716*x + 565.5742
R^2 = 0.9999
BEC = 0.005 ppb
LoD = 0.0004 ppb

208Pb (STD)



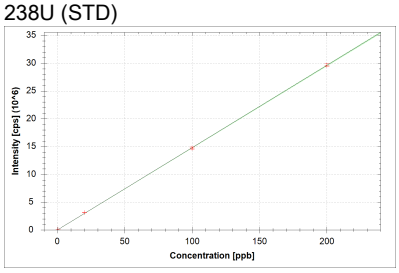
f(x) = 136926.8160*x + 757.6839
R^2 = 1.0000
BEC = 0.006 ppb
LoD = 0.0020 ppb

232Th (STD)



f(x) = 146789.5289*x + 7010.5313
R^2 = 1.0000
BEC = 0.048 ppb
LoD = 0.0093 ppb

238U (STD)



f(x) = 148015.0712*x + 1603.3890
R^2 = 1.0000
BEC = 0.011 ppb
LoD = 0.0010 ppb

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Metals Analysis

WG489196 **ICPMS MWMT**

Sample	Date	SCN	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cs	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Te	Th	Tl	U	V	Zn
WG489196ICV	01/02/20 12:24	MS191231-8	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG489196ICB	01/02/20 12:25		X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG489196PQV	01/02/20 12:27	MS191231-5	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG489196ICSA	01/02/20 12:29		X		X			X	X		X		X		X		X		X	X			X		X	X	
WG489196ICSAB	01/02/20 12:31	MS191119-7	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG488413PBS	01/02/20 12:36		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L56452-01	01/02/20 12:38				X				X									X	X					X			
L56452-01MS1	01/02/20 12:40	MS2XW	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
L56452-01MSD1	01/02/20 12:42	MS2XW	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG488413LFB2	01/02/20 12:43	MS191119-5	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG488184PBS	01/02/20 12:45		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L56331-01	01/02/20 12:47		X		X			X	X	X	X				X	X	X	X	X	X			X	X	X	X	X
L56331-02	01/02/20 12:49		X		X			X	X	X	X					X	X	X	X	X			X	X	X	X	X
L56331-03	01/02/20 12:50		X		X			X	X	X	X				X	X	X	X	X	X			X	X	X	X	X
L56331-04	01/02/20 12:52		X		X			X	X	X	X					X	X	X	X	X			X	X	X	X	X
WG489196CCV1	01/02/20 12:54	MS191231-2	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG489196CCB1	01/02/20 12:56		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L56331-05	01/02/20 12:58		X		X			X	X	X	X					X	X	X	X	X			X	X	X	X	X
L56331-05MS1	01/02/20 12:59	MS191119-5	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
L56331-05MSD1	01/02/20 13:01	MS191119-5	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
L56331-06	01/02/20 13:03		X		X			X	X	X	X				X	X	X	X	X	X			X	X	X	X	X
L56331-06SDL	01/02/20 13:05		X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
L56331-07	01/02/20 13:06		X		X			X	X	X	X					X	X	X	X	X			X	X	X	X	X
L56331-08	01/02/20 13:08		X		X			X	X	X	X				X	X	X	X	X	X			X	X	X	X	X
L56331-09	01/02/20 13:10		X		X			X	X	X	X				X	X	X	X	X	X			X	X	X	X	X
WG488184LFB2	01/02/20 13:12	MS191119-5	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Metals Analysis

WG489196 **ICPMS MWMT**

Sample	Date	SCN	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cs	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Te	Th	Tl	U	V	Zn
WG488496PBS	01/02/20 13:14		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WG489196CCV2	01/02/20 13:15	MS191231-2	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG489196CCB2	01/02/20 13:17		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L56453-01	01/02/20 13:19		X		X			X	X	X	X				X	X	X	X	X	X			X	X	X	X	X
L56453-02	01/02/20 13:21		X		X			X	X	X	X				X	X	X	X	X	X			X	X	X	X	X
L56453-03	01/02/20 13:22		X		X			X	X	X	X				X	X	X	X	X	X			X	X	X	X	X
L56453-03MS1	01/02/20 13:24	MS191119-5	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
L56453-03MSD1	01/02/20 13:26	MS191119-5	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
L56453-04	01/02/20 13:28		X		X			X	X	X	X					X	X	X	X	X			X	X	X	X	X
L56453-05	01/02/20 13:30		X		X			X	X	X	X					X	X	X	X	X			X	X	X	X	X
L56453-06	01/02/20 13:31		X		X			X	X	X	X				X	X	X	X	X	X			X	X	X	X	X
WG488496LFB2	01/02/20 13:33	MS191119-5	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG489196CCV3	01/02/20 13:35	MS191231-2	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X
WG489196CCB3	01/02/20 13:37		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WG489196ULRV	01/02/20 13:39	MS191231-3	X		X			X	X	X	X		X		X	X	X	X	X	X			X	X	X	X	X

L56331-2006231417

ICPMS MWMT

QC List Type: QC-ICPMS-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICPMS-MWMT
QC Ref: MA-ICPMS-T-846
Group ID: MA-G-MS-MWMT
Method Ref: M6020
SOP Ref: SOPII022

WG489377

ACZ Laboratories, Inc

Instrument ID: ICPMS6
Analyst: BSU
ACZ Dept: 33
Create Date: 01/03/2020 16:49
Start Date/Time: 1/3/20 4:45pm
End Date/Time: ⊥

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	CU MS MW MT	MN MS MW MT	Dilution	
1	WG489377ICV	MS191231-8			1			✓	✓	1	
2	WG489377ICB	NONE			1			✓	✓	1	
3	WG489377PQV	MS191231-5			1			✓	✓	1	
4	WG489377ICSA	MS191119-6			1			✓	✓	1	
5	WG489377ICSAB	MS191119-7			1			✓	✓	1	
6	WG489377ULRV	MS191231-3			1			✓	✓	1	
7	WG489377WASH	NONE			1			✓	✓	1	
8	WG488184PBS	NONE			1			✓	✓	1	
9	L56331-01	STSB32_0.5-3			1		4660*	✓		1000	↑Cu
10	L56331-02	STSB32_6-15			1		3310*	✓	✓	200	↑Cu/Mn
11	L56331-03	STSB34_0.5-3			1		2780*	✓		200	↑Cu
12	L56331-04	STSB34_6-15			1		3830*	✓	✓	200	↑Cu/Mn
13	L56331-05	STSB33_0.5-3			1		3390*	✓	✓	500	⊥
14	WG489377CCV1	MS191231-2			1			✓	✓	1	
15	WG489377CCB1	NONE	BSU 1/6/20		1			✓	✓	1	
16	L56331-05MS1	MS191119-5	~~MS~~		1			✓	✓	500	↑Cu/Mn
17	L56331-05MSD1	MS191119-5			1			✓	✓	500	⊥
18	L56331-06	STSB33_6-15			1		1110*	✓		5	↑Mn
19	L56331-07	STSB33-FD_0.5-3			1		3330*	✓	✓	500	↑Cu/Mn
20	L56331-08	STSB35_0.5-3			1		3330*	✓		500	↑Cu
21	L56331-09	STSB35_6-15			1		4930*	✓		2000	⊥
22	WG488184LFB2	MS191119-5			1			✓	✓	1	

Reanalyze 1/3/20 for confirmation

Report Comments:

Internal Comments

AREV: BSU 1/6/20
Initials, Date

SREV: 1.7.20
Initials, Date

1/3/2020 4:49:28 PM 10120

L56331-2006231417

ICPMS MWMT

QC List Type: QC-ICPMS-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICPMS-MWMT
QC Ref: MA-ICPMS-T-846
Group ID: MA-G-MS-MWMT
Method Ref: M6020
SOP Ref: SOPII022

WG489377

ACZ Laboratories, Inc

Instrument ID: ICPMS6
Analyst:
ACZ Dept: 33
Create Date: 01/03/2020 16:49
Start Date/Time:
End Date/Time:

moved up in template Br 1/3/20

SE Q	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	CU MS MW MT	MN MS MW MT	Dilution
23	WG488496PBS	NONE			1			☑	☑	1
24	L56453-01	STSB05_0.5-3			1		4210	☑	☐	1000
25	L56453-02	STSB05_6-15			1		3620	☑	☐	1000
26	WG489377CCV2	MS191231-2			1			☑	☑	1
27	WG489377CCB2	NONE			1			☑	☑	1
28	L56453-03	STSB05_45-55			1		874	☑	☐	1
29	L56453-03MS1	MS191119-5			1			☑	☑	1
30	L56453-03MSD1	MS191119-5			1			☑	☑	1
31	L56453-04	STSB05_66-71			1		2190	☑	☑	100
32	L56453-05	STSB05_76-81			1		1830	☑	☑	50
33	L56453-06	STSB06_0.5-3			1		1780	☑	☐	1
34	L56453-06SDL	NONE			1			☑	☑	1
35	WG488496LFB2	MS191119-5			1			☑	☑	1
36	WG489377CCV3	MS191231-2			1			☑	☑	1
37	WG489377CCB3	NONE			1			☑	☑	1

↑Cu ⊥

↑Mn ⊥

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/3/2020 4:49:29 PM 10120

ICPMS MWMT

QC List Type: QC-ICPMS-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICPMS-MWMT
QC Ref: MA-ICPMS-T-846
Group ID: MA-G-MS-MWMT
Method Ref: M6020
SOP Ref: SOPII022

WG489377

ACZ Laboratories, Inc

Instrument ID: ICPMS6
Analyst:
ACZ Dept: 33
Create Date: 01/03/2020 16:49
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MSD1	ICPMS Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56453-01	BUCKET ||
L56453-02	BUCKET ||
L56453-03	BUCKET ||
L56453-03MS1	ICPMS Spike
L56453-03MSD1	ICPMS Spike
L56453-04	BUCKET ||
L56453-05	BUCKET ||
L56453-06	BUCKET ||
WG488184LFB2	ICPMS LFB
WG488496LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/3/2020 4:49:29 PM 10120

ACZ Laboratories, Inc.
ICPMS DATA REVIEW CHECKLIST

AREV:	Bru
Date:	1/6/20
SREV:	DR
Date:	1-7-20

Workgroup:	459377
Sample Type:	MWMT
Analysis Date:	1/3/20
Analyst:	Bru

	Yes	No	N/A
1) Is the instrument ID on the bench sheet correct?	✓		
2) Has a passing method tune been performed within 24 hours?	✓		
3) Was the low calibration point dropped? If yes, notify PM of change to PQLs.			✓
4) Is the linear regression ≥ 0.995 for the analytes of interest?	✓		
5) Was the PQV standard analyzed & evaluated for DW samples ? (Fail in LIMS if no DW sxs in WG.)	✓		
6) Do the dilution factors on the benchsheet match the sequence in the raw data?	✓		
7) Is any sample analyzed on dilution appropriately "D" qualified (not required for o-cal, EC, TDS)?	✓		
8) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?			✓
9) Are the % Recoveries of the internal standards within the method limits?	✓		
10) Are all of the QC critera listed in LIMS within specified limits?	✓		
11) Are all samples requiring re-analysis / re-digestion at REDO / REDX status?			✓
12) Are all errors properly crossed out (i.e. single-line, dated & initialed)?	✓		
13) Is a current standard/reagent form attached to the workgroup?	✓		
14) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	X		

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
331-05/ms/msD	↑ Cu = 118.76%, 105.19%	M3 flagged assoc. sy
↓	↓ Mn = 60%, 40%	↓
453-04, -05	U qualifier on dilution	Diluted to ↑ Mn - D1, D2

FRMII012.02.08.10

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG489377

Date Reported: 07-Jan-20
Run ID: R1766703
Date Analyzed: 03-Jan-20
ICAL Workgroup:
Instrument ID: ICPMS6

WG489377ICV

Tag: Measured: 1/3/2020 7:05:51 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.05173	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	103	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.04966	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	99	1		%	++	0.0004	0.002			

WG489377ICB

Tag: Measured: 1/3/2020 7:07:40 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			

WG489377PQV

Tag: Measured: 1/3/2020 7:09:29 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.00209	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	104	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.00207	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	103	1		%	++	0.0004	0.002			

WG489377ICSA

Tag: Measured: 1/3/2020 7:11:20 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.00045	1	B	mg/L	++	0.0004	0.002			

WG489377ICSAB

Tag: Measured: 1/3/2020 7:13:13 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.01767	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	88	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.01842	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	92	1		%	++	0.0004	0.002			

WG488184PBS

Tag: 1 Measured: 1/3/2020 7:16:57 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			

WG488184LFB2

Tag: 1 Measured: 1/3/2020 7:18:48 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.04937	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	99	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.04926	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	98	1		%	++	0.0004	0.002			

L56331-01 Tag: 1 Measured: 1/3/2020 7:20:40 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	410	1000		mg/L	++	0.8	2		M3	

L56331-02 Tag: 1 Measured: 1/3/2020 7:22:31 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	55.2	200		mg/L	++	0.2	0.4		M3	
SREV	MANGANESE	IS-MWMT	9.49	200		mg/L	++	0.08	0.4		M3	

L56331-03 Tag: 1 Measured: 1/3/2020 7:24:22 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	65.0	200		mg/L	++	0.2	0.4		M3	

L56331-04 Tag: 1 Measured: 1/3/2020 7:26:13 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	81.8	200		mg/L	++	0.2	0.4		M3	
SREV	MANGANESE	IS-MWMT	15.9	200		mg/L	++	0.08	0.4		M3	

L56331-05 Tag: 1 Measured: 1/3/2020 7:28:04 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	170	500		mg/L	++	0.4	1		M3	
SREV	MANGANESE	IS-MWMT	5.3	500		mg/L	++	0.2	1		M3	

WG489377CCV1 Tag: Measured: 1/3/2020 7:29:54 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.24849	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	99	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.09952 ✓	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	99	1		%	++	0.0004	0.002			

WG489377CCB1 Tag: Measured: 1/3/2020 7:31:43 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND		1	U ✓	mg/L	++	0.0008	0.002			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			

L56331-05MS1 Tag: 1 Measured: 1/3/2020 7:33:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	175.95 ✓	500		mg/L	++	0.4	1			
SREV	COPPER	REC	11876	500		%	ALRT	0.4	1		M3 4x	
SREV	MANGANESE	FOUND	5.33	500		mg/L	++	0.2	1			
SREV	MANGANESE	REC	60	500		%	ALRT	0.2	1		M3 4x	

L56331-05MSD1 Tag: 1 Measured: 1/3/2020 7:35:25 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	175.27	500		mg/L	++	0.4	1			
SREV	COPPER	REC	10519	500		%	ALRT	0.4	1	4x	M3	
SREV	COPPER	RPD	0	500		%	++	0.4	1			
SREV	MANGANESE	FOUND	5.32	500		mg/L	++	0.2	1	4x		
SREV	MANGANESE	REC	40	500		%	ALRT	0.2	1		M3	
SREV	MANGANESE	RPD	0	500		%	++	0.2	1			

L56331-06 Tag: 1 Measured: 1/3/2020 7:37:16 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	.023	5		mg/L	++	0.004	0.01		M3	

L56331-07 Tag: 1 Measured: 1/3/2020 7:39:07 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	156	500		mg/L	++	0.4	1		M3	
SREV	MANGANESE	IS-MWMT	5.1	500		mg/L	++	0.2	1		M3	

L56331-08 Tag: 1 Measured: 1/3/2020 7:40:58 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	183	500		mg/L	++	0.4	1		M3	

L56331-09 Tag: 1 Measured: 1/3/2020 7:42:49 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	505	2000		mg/L	++	2	4		M3	

WG489377CCV2 Tag: Measured: 1/3/2020 7:44:40 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.24608	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	98	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.09903	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	99	1		%	++	0.0004	0.002			

WG489377CCB2 Tag: Measured: 1/3/2020 7:46:29 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			

WG488496PBS Tag: 1 Measured: 1/3/2020 7:48:20 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.0019	1	B	mg/L	++	0.0008	0.002			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			

WG488496LFB2 Tag: 1 Measured: 1/3/2020 7:50:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.05011	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	100	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.04816	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	96	1		%	++	0.0004	0.002			

L56453-01 Tag: 1 Measured: 1/3/2020 7:52:03 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	381	1000		mg/L	++	0.8	2			

L56453-02 Tag: 1 Measured: 1/3/2020 7:53:54 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	281	1000		mg/L	++	0.8	2			

L56453-03 Tag: 1 Measured: 1/3/2020 7:55:46 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	.0201	1		mg/L	++	0.0008	0.002			
NEED	MANGANESE	REG	.295	1		mg/L	++	0.0004	0.002			

L56453-03MS1 Tag: 1 Measured: 1/3/2020 7:57:37 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.06559	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	91	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.33783	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	85	1		%	++	0.0004	0.002			

L56453-03MSD1 Tag: 1 Measured: 1/3/2020 7:59:28 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.06508	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	90	1		%	++	0.0008	0.002			
SREV	COPPER	RPD	1	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.33771	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	85	1		%	++	0.0004	0.002			
SREV	MANGANESE	RPD	0	1		%	++	0.0004	0.002			

L56453-04 Tag: 1 Measured: 1/3/2020 8:01:19 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT		100	U	mg/L	++	0.08	0.2		D1 D2	
SREV	MANGANESE	IS-MWMT	9.95	100		mg/L	++	0.04	0.2			

L56453-05 Tag: 1 Measured: 1/3/2020 8:03:10 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT		50	U	mg/L	++	0.04	0.1		D1 D2	
SREV	MANGANESE	IS-MWMT	10.7	50		mg/L	++	0.02	0.1			

L56453-06 Tag: 1 Measured: 1/3/2020 8:05:01 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	IS-MWMT	.055	1		mg/L	++	0.0008	0.002			
NEED	MANGANESE	REG	.483	1		mg/L	++	0.0004	0.002			

WG489377CCV3

Tag: Measured: 1/3/2020 8:06:51 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.24669	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	98	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.09858	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	98	1		%	++	0.0004	0.002			

WG489377CCB3

Tag: Measured: 1/3/2020 8:08:40 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			

L56453-06SDL

Tag: Measured: 1/3/2020 8:10:31 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	D	7	1		%	++	0.0008	0.002			
SREV	COPPER	FOUND	0.01175	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REG	0.05875	1		mg/L	++	0.0008	0.002			
SREV	MANGANESE	D	2	1		%	++	0.0004	0.002			
SREV	MANGANESE	FOUND	0.0947	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REG	0.4735	1		mg/L	++	0.0004	0.002			

WG489377CCV4

Tag: Measured: 1/3/2020 8:12:21 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	0.24694	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	99	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	0.09767	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	97	1		%	++	0.0004	0.002			

WG489377CCB4

Tag: Measured: 1/3/2020 8:14:10 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND		1	U	mg/L	++	0.0008	0.002			
SREV	MANGANESE	FOUND		1	U	mg/L	++	0.0004	0.002			

WG489377ULRV

Tag: Measured: 1/3/2020 8:16:01 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	COPPER	FOUND	4.71552	1		mg/L	++	0.0008	0.002			
SREV	COPPER	REC	94	1		%	++	0.0008	0.002			
SREV	MANGANESE	FOUND	1.88914	1		mg/L	++	0.0004	0.002			
SREV	MANGANESE	REC	94	1		%	++	0.0004	0.002			

Sample Name	WG488184PBS
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:16:57 PM
Sample Type	Sample
Total Dilution	1.0000
Vial Location	4101

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	0.010	0.01	ppb	15.6	200	
11	B	6	NoGas	207.711	207.71	ppb	1.0	20	OCAL
27	Al	72	NoGas	4.201	4.2	ppb	1.5	1000	
51	V	45	He	-0.129	-0.13	ppb	1.6	200	
52	Cr	45	He	0.186	0.19	ppb	2.1	200	
55	Mn	72	NoGas	0.012	0.01	ppb	0.5	200	
56	Fe	45	H2	4.010	4.01	ppb	0.9	1000	
59	Co	72	NoGas	0.038	0.04	ppb	10.3	200	
60	Ni	45	He	0.096	0.1	ppb	7.1	500	
63	Cu	45	He	0.526	0.53	ppb	1.3	500	
66	Zn	72	NoGas	0.860	0.86	ppb	3.5	1000	
75	As	45	He	0.055	0.06	ppb	8.8	200	
78	Se	45	H2	0.045	0.04	ppb	8.9	500	
98	Mo	115	NoGas	0.048	0.05	ppb	5.0	200	
107	Ag	115	NoGas	0.001	0	ppb	27.0	50	
111	Cd	115	NoGas	-0.001	0	ppb	48.8	200	
118	Sn	115	NoGas	-0.025	-0.02	ppb	10.3	200	
121	Sb	115	NoGas	0.023	0.02	ppb	0.6	25	
125	Te	115	NoGas	0.000	0	ppb	50.0	200	
133	Cs	115	NoGas	0.017	0.02	ppb	3.5	200	
137	Ba	115	NoGas	0.917	0.92	ppb	1.1	500	
205	Tl	209	NoGas	0.063	0.06	ppb	5.3	200	
208	Pb	209	NoGas	0.009	0.01	ppb	6.0	500	
232	Th	209	NoGas	-0.007	-0.01	ppb	16.2	200	
238	U	209	NoGas	0.001	0	ppb	16.4	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	587760.93	0.8	102.07	60	120	
45	Sc	NoGas	2826044.47	2909781.69	1.1	102.96	60	120	
45	Sc	H2	1327985.64	1427381.57	0.9	107.48	60	120	
45	Sc	He	179429.61	193104.17	0.3	107.62	60	120	
72	Ge	NoGas	652041.19	653596.27	0.1	100.24	60	120	
72	Ge	H2	421504.49	447140.14	1.3	106.08	60	120	
72	Ge	He	124036.41	133255.50	1.6	107.43	60	120	
115	In	NoGas	1890625.99	1919848.06	0.5	101.55	60	120	
115	In	H2	1860676.25	1943299.30	0.7	104.44	60	120	
115	In	He	465165.68	502692.97	1.0	108.07	60	120	
159	Tb	NoGas	1972699.36	2000342.56	0.5	101.4	60	120	
209	Bi	NoGas	2051300.68	2074728.39	0.5	101.14	60	120	

Sample Name	WG488184LFB2
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:18:48 PM
Sample Type	Sample
Total Dilution	1.0000
Vial Location	4102

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	48.549	48.55	ppb	0.9	200	
11	B	6	NoGas	224.467	224.47	ppb	1.0	20	OCAL
27	Al	72	NoGas	53.320	53.32	ppb	0.8	1000	
51	V	45	He	48.889	48.89	ppb	1.2	200	
52	Cr	45	He	48.630	48.63	ppb	1.6	200	
55	Mn	72	NoGas	49.258	49.26	ppb	0.5	200	
56	Fe	45	H2	53.961	53.96	ppb	0.6	1000	
59	Co	72	NoGas	49.853	49.85	ppb	0.4	200	
60	Ni	45	He	48.131	48.13	ppb	1.5	500	
63	Cu	45	He	49.367	49.37	ppb	1.2	500	
66	Zn	72	NoGas	50.074	50.07	ppb	0.8	1000	
75	As	45	He	49.297	49.3	ppb	1.7	200	
78	Se	45	H2	48.409	48.41	ppb	1.5	500	
98	Mo	115	NoGas	46.853	46.85	ppb	1.3	200	
107	Ag	115	NoGas	10.004	10	ppb	1.5	50	
111	Cd	115	NoGas	47.269	47.27	ppb	0.5	200	
118	Sn	115	NoGas	45.795	45.8	ppb	0.2	200	
121	Sb	115	NoGas	10.057	10.06	ppb	0.7	25	
125	Te	115	NoGas	46.094	46.09	ppb	0.6	200	
133	Cs	115	NoGas	47.247	47.25	ppb	0.5	200	
137	Ba	115	NoGas	47.561	47.56	ppb	0.4	500	
205	Tl	209	NoGas	48.805	48.8	ppb	0.7	200	
208	Pb	209	NoGas	49.290	49.29	ppb	0.6	500	
232	Th	209	NoGas	49.288	49.29	ppb	0.8	200	
238	U	209	NoGas	48.089	48.09	ppb	0.8	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	590938.54	1.4	102.62	60	120	
45	Sc	NoGas	2826044.47	2960649.95	1.0	104.76	60	120	
45	Sc	H2	1327985.64	1413651.58	1.7	106.45	60	120	
45	Sc	He	179429.61	195528.52	1.5	108.97	60	120	
72	Ge	NoGas	652041.19	666023.26	1.1	102.14	60	120	
72	Ge	H2	421504.49	444548.21	1.6	105.47	60	120	
72	Ge	He	124036.41	133964.27	0.9	108	60	120	
115	In	NoGas	1890625.99	1951952.99	0.9	103.24	60	120	
115	In	H2	1860676.25	1954484.51	1.0	105.04	60	120	
115	In	He	465165.68	512266.63	1.9	110.13	60	120	
159	Tb	NoGas	1972699.36	2031729.78	0.2	102.99	60	120	
209	Bi	NoGas	2051300.68	2106732.97	1.1	102.7	60	120	

Sample Name	L56331-01
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:20:40 PM
Sample Type	Sample
Total Dilution	1000.0000
Vial Location	4103

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	28.374	0.03	ppb	5.1	200	
11	B	6	NoGas	8108.725	8.11	ppb	5.0	20	
27	Al	72	NoGas	25248.216	25.25	ppb	0.9	1000	
51	V	45	He	-1088.513	-1.09	ppb	2.4	200	
52	Cr	45	He	-15.747	-0.02	ppb	5.5	200	
55	Mn	72	NoGas	5546.176	5.55	ppb	0.2	200	
56	Fe	45	H2	5135.112	5.14	ppb	1.0	1000	
59	Co	72	NoGas	474.843	0.48	ppb	3.4	200	
60	Ni	45	He	341.021	0.34	ppb	2.8	500	
63	Cu	45	He	409875.596	409.88	ppb	1.6	500	
66	Zn	72	NoGas	1095.278	1.1	ppb	3.9	1000	
75	As	45	He	-38.657	-0.04	ppb	14.7	200	
78	Se	45	H2	7.422	0.01	ppb	12.1	500	
98	Mo	115	NoGas	125.840	0.13	ppb	11.7	200	
107	Ag	115	NoGas	0.063	0	ppb	12.7	50	
111	Cd	115	NoGas	6.523	0.01	ppb	15.8	200	
118	Sn	115	NoGas	-46.931	-0.05	ppb	9.0	200	
121	Sb	115	NoGas	19.721	0.02	ppb	4.9	25	
125	Te	115	NoGas	26.172	0.03	ppb	33.1	200	
133	Cs	115	NoGas	7.292	0.01	ppb	13.7	200	
137	Ba	115	NoGas	11.503	0.01	ppb	10.8	500	
205	Tl	209	NoGas	76.559	0.08	ppb	9.8	200	
208	Pb	209	NoGas	23.609	0.02	ppb	12.7	500	
232	Th	209	NoGas	19.711	0.02	ppb	12.2	200	
238	U	209	NoGas	27.917	0.03	ppb	4.2	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	570388.97	0.9	99.05	60	120	
45	Sc	NoGas	2826044.47	2870514.54	0.6	101.57	60	120	
45	Sc	H2	1327985.64	1398824.94	1.2	105.33	60	120	
45	Sc	He	179429.61	191945.00	1.1	106.98	60	120	
72	Ge	NoGas	652041.19	653014.42	0.5	100.15	60	120	
72	Ge	H2	421504.49	443499.57	1.0	105.22	60	120	
72	Ge	He	124036.41	131712.16	1.8	106.19	60	120	
115	In	NoGas	1890625.99	1911411.17	1.0	101.1	60	120	
115	In	H2	1860676.25	1905474.23	1.1	102.41	60	120	
115	In	He	465165.68	494482.01	1.8	106.3	60	120	
159	Tb	NoGas	1972699.36	1981318.26	0.6	100.44	60	120	
209	Bi	NoGas	2051300.68	2060963.32	0.1	100.47	60	120	

Sample Name	L56331-02
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:22:31 PM
Sample Type	Sample
Total Dilution	200.0000
Vial Location	4104

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	4.848	0.02	ppb	13.1	200	
11	B	6	NoGas	1055.444	5.28	ppb	1.5	20	
27	Al	72	NoGas	4922.791	24.61	ppb	0.7	1000	
51	V	45	He	-226.095	-1.13	ppb	3.3	200	
52	Cr	45	He	-4.987	-0.02	ppb	10.8	200	
55	Mn	72	NoGas	9485.231	47.43	ppb	0.1	200	
56	Fe	45	H2	73.485	0.37	ppb	2.7	1000	
59	Co	72	NoGas	500.886	2.5	ppb	0.6	200	
60	Ni	45	He	227.600	1.14	ppb	4.0	500	
63	Cu	45	He	55215.318	276.08	ppb	1.2	500	
66	Zn	72	NoGas	466.576	2.33	ppb	0.8	1000	
75	As	45	He	-9.235	-0.05	ppb	12.8	200	
78	Se	45	H2	41.832	0.21	ppb	6.0	500	
98	Mo	115	NoGas	2.445	0.01	ppb	15.4	200	
107	Ag	115	NoGas	-0.176	0	ppb	16.4	50	
111	Cd	115	NoGas	4.747	0.02	ppb	26.1	200	
118	Sn	115	NoGas	-11.922	-0.06	ppb	2.2	200	
121	Sb	115	NoGas	-0.081	0	ppb	23.8	25	
125	Te	115	NoGas	0.241	0	ppb	24.7	200	
133	Cs	115	NoGas	0.683	0	ppb	7.9	200	
137	Ba	115	NoGas	11.910	0.06	ppb	7.8	500	
205	Tl	209	NoGas	39.330	0.2	ppb	10.1	200	
208	Pb	209	NoGas	6.982	0.04	ppb	9.9	500	
232	Th	209	NoGas	-1.047	0	ppb	9.3	200	
238	U	209	NoGas	19.408	0.1	ppb	1.9	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	580774.63	0.8	100.85	60	120	
45	Sc	NoGas	2826044.47	2946605.78	0.2	104.27	60	120	
45	Sc	H2	1327985.64	1411486.33	1.2	106.29	60	120	
45	Sc	He	179429.61	195178.64	1.0	108.78	60	120	
72	Ge	NoGas	652041.19	665924.26	0.4	102.13	60	120	
72	Ge	H2	421504.49	447338.23	0.5	106.13	60	120	
72	Ge	He	124036.41	134172.01	0.8	108.17	60	120	
115	In	NoGas	1890625.99	1941871.08	0.2	102.71	60	120	
115	In	H2	1860676.25	1928066.59	1.0	103.62	60	120	
115	In	He	465165.68	507210.27	2.2	109.04	60	120	
159	Tb	NoGas	1972699.36	2032289.23	1.0	103.02	60	120	
209	Bi	NoGas	2051300.68	2096450.13	0.8	102.2	60	120	

Sample Name	L56331-03
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:24:22 PM
Sample Type	Sample
Total Dilution	200.0000
Vial Location	4105

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	1.836	0.01	ppb	28.2	200	
11	B	6	NoGas	743.315	3.72	ppb	2.0	20	
27	Al	72	NoGas	3810.787	19.05	ppb	0.6	1000	
51	V	45	He	-238.515	-1.19	ppb	2.8	200	
52	Cr	45	He	-5.425	-0.03	ppb	9.1	200	
55	Mn	72	NoGas	1144.604	5.72	ppb	0.4	200	
56	Fe	45	H2	110.007	0.55	ppb	1.6	1000	
59	Co	72	NoGas	110.209	0.55	ppb	3.6	200	
60	Ni	45	He	90.704	0.45	ppb	2.1	500	
63	Cu	45	He	65017.523	325.09	ppb	2.0	500	
66	Zn	72	NoGas	200.699	1	ppb	1.8	1000	
75	As	45	He	-9.447	-0.05	ppb	13.9	200	
78	Se	45	H2	-5.513	-0.03	ppb	2.3	500	
98	Mo	115	NoGas	1.146	0.01	ppb	26.2	200	
107	Ag	115	NoGas	-0.166	0	ppb	62.4	50	
111	Cd	115	NoGas	1.373	0.01	ppb	2.7	200	
118	Sn	115	NoGas	-13.263	-0.07	ppb	8.8	200	
121	Sb	115	NoGas	0.975	0	ppb	9.5	25	
125	Te	115	NoGas	-0.611	0	ppb	86.6	200	
133	Cs	115	NoGas	0.734	0	ppb	2.3	200	
137	Ba	115	NoGas	12.605	0.06	ppb	13.9	500	
205	Tl	209	NoGas	52.576	0.26	ppb	10.6	200	
208	Pb	209	NoGas	5.055	0.02	ppb	14.6	500	
232	Th	209	NoGas	-1.651	-0.01	ppb	19.5	200	
238	U	209	NoGas	3.107	0.02	ppb	8.5	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	573813.05	0.9	99.64	60	120	
45	Sc	NoGas	2826044.47	2922411.06	0.4	103.41	60	120	
45	Sc	H2	1327985.64	1395649.74	0.5	105.1	60	120	
45	Sc	He	179429.61	194603.13	2.1	108.46	60	120	
72	Ge	NoGas	652041.19	662633.17	0.3	101.62	60	120	
72	Ge	H2	421504.49	444243.72	0.4	105.39	60	120	
72	Ge	He	124036.41	132761.92	1.7	107.03	60	120	
115	In	NoGas	1890625.99	1929340.98	0.1	102.05	60	120	
115	In	H2	1860676.25	1912114.58	1.0	102.76	60	120	
115	In	He	465165.68	499540.85	2.6	107.39	60	120	
159	Tb	NoGas	1972699.36	2018433.95	0.5	102.32	60	120	
209	Bi	NoGas	2051300.68	2091093.67	0.4	101.94	60	120	

Sample Name	L56331-04
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:26:13 PM
Sample Type	Sample
Total Dilution	200.0000
Vial Location	4106

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	16.124	0.08	ppb	13.8	200	
11	B	6	NoGas	698.406	3.49	ppb	1.0	20	
27	Al	72	NoGas	14147.285	70.74	ppb	0.0	1000	
51	V	45	He	-243.121	-1.22	ppb	2.0	200	
52	Cr	45	He	-4.825	-0.02	ppb	3.4	200	
55	Mn	72	NoGas	15868.304	79.34	ppb	0.4	200	
56	Fe	45	H2	150.279	0.75	ppb	7.1	1000	
59	Co	72	NoGas	833.084	4.16	ppb	0.3	200	
60	Ni	45	He	442.378	2.21	ppb	0.4	500	
63	Cu	45	He	81843.716	409.22	ppb	0.9	500	
66	Zn	72	NoGas	700.930	3.5	ppb	3.5	1000	
75	As	45	He	-8.763	-0.04	ppb	7.6	200	
78	Se	45	H2	89.428	0.45	ppb	1.8	500	
98	Mo	115	NoGas	9.574	0.05	ppb	47.7	200	
107	Ag	115	NoGas	-0.042	0	ppb	46.5	50	
111	Cd	115	NoGas	7.242	0.04	ppb	25.3	200	
118	Sn	115	NoGas	-11.665	-0.06	ppb	3.7	200	
121	Sb	115	NoGas	0.048	0	ppb	16.4	25	
125	Te	115	NoGas	0.840	0	ppb	57.8	200	
133	Cs	115	NoGas	1.244	0.01	ppb	26.8	200	
137	Ba	115	NoGas	18.696	0.09	ppb	6.1	500	
205	Tl	209	NoGas	60.216	0.3	ppb	12.4	200	
208	Pb	209	NoGas	8.637	0.04	ppb	17.7	500	
232	Th	209	NoGas	-0.221	0	ppb	28.1	200	
238	U	209	NoGas	34.438	0.17	ppb	3.9	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	565913.19	0.1	98.27	60	120	
45	Sc	NoGas	2826044.47	2884012.87	0.7	102.05	60	120	
45	Sc	H2	1327985.64	1382930.67	1.7	104.14	60	120	
45	Sc	He	179429.61	193143.72	0.8	107.64	60	120	
72	Ge	NoGas	652041.19	656250.70	0.7	100.65	60	120	
72	Ge	H2	421504.49	439083.92	1.9	104.17	60	120	
72	Ge	He	124036.41	132785.41	1.0	107.05	60	120	
115	In	NoGas	1890625.99	1922221.06	0.2	101.67	60	120	
115	In	H2	1860676.25	1894111.59	1.7	101.8	60	120	
115	In	He	465165.68	505893.17	2.5	108.76	60	120	
159	Tb	NoGas	1972699.36	1992856.59	0.7	101.02	60	120	
209	Bi	NoGas	2051300.68	2058505.54	0.7	100.35	60	120	

Sample Name	L56331-05
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:28:04 PM
Sample Type	Sample
Total Dilution	500.0000
Vial Location	4107

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	18.762	0.04	ppb	18.3	200	
11	B	6	NoGas	1085.472	2.17	ppb	2.1	20	
27	Al	72	NoGas	26958.377	53.92	ppb	0.4	1000	
51	V	45	He	-600.274	-1.2	ppb	6.2	200	
52	Cr	45	He	-9.670	-0.02	ppb	9.7	200	
55	Mn	72	NoGas	5251.674	10.5	ppb	0.5	200	
56	Fe	45	H2	499.436	1	ppb	4.4	1000	
59	Co	72	NoGas	691.528	1.38	ppb	1.8	200	
60	Ni	45	He	344.603	0.69	ppb	2.9	500	
63	Cu	45	He	169783.471	339.57	ppb	1.0	500	
66	Zn	72	NoGas	562.659	1.12	ppb	14.9	1000	
75	As	45	He	-22.538	-0.04	ppb	25.0	200	
78	Se	45	H2	6.885	0.01	ppb	9.9	500	
98	Mo	115	NoGas	24.136	0.05	ppb	68.3	200	
107	Ag	115	NoGas	0.183	0	ppb	8.2	50	
111	Cd	115	NoGas	4.509	0.01	ppb	46.8	200	
118	Sn	115	NoGas	-29.135	-0.06	ppb	18.4	200	
121	Sb	115	NoGas	-0.733	0	ppb	3.2	25	
125	Te	115	NoGas	-0.047	0	ppb	100.0	200	
133	Cs	115	NoGas	5.227	0.01	ppb	42.5	200	
137	Ba	115	NoGas	19.016	0.04	ppb	45.1	500	
205	Tl	209	NoGas	171.852	0.34	ppb	13.0	200	
208	Pb	209	NoGas	16.537	0.03	ppb	22.8	500	
232	Th	209	NoGas	1.431	0	ppb	56.9	200	
238	U	209	NoGas	48.324	0.1	ppb	6.6	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	564190.22	0.3	97.97	60	120	
45	Sc	NoGas	2826044.47	2861875.58	0.7	101.27	60	120	
45	Sc	H2	1327985.64	1381585.43	1.2	104.04	60	120	
45	Sc	He	179429.61	192461.03	1.3	107.26	60	120	
72	Ge	NoGas	652041.19	653411.81	0.7	100.21	60	120	
72	Ge	H2	421504.49	440679.25	2.0	104.55	60	120	
72	Ge	He	124036.41	131107.61	1.3	105.7	60	120	
115	In	NoGas	1890625.99	1917110.80	0.8	101.4	60	120	
115	In	H2	1860676.25	1905478.60	1.5	102.41	60	120	
115	In	He	465165.68	497015.45	1.1	106.85	60	120	
159	Tb	NoGas	1972699.36	1986619.23	0.6	100.71	60	120	
209	Bi	NoGas	2051300.68	2054196.31	0.4	100.14	60	120	

Sample Name	L56331-05MS1
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:33:33 PM
Sample Type	Sample
Total Dilution	500.0000
Vial Location	4108

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	60.419	0.12	ppb	7.0	200	
11	B	6	NoGas	679.688	1.36	ppb	0.2	20	
27	Al	72	NoGas	27219.172	54.44	ppb	1.4	1000	
51	V	45	He	-514.015	-1.03	ppb	6.7	200	
52	Cr	45	He	42.551	0.08	ppb	2.3	200	
55	Mn	72	NoGas	5331.646	10.66	ppb	0.8	200	
56	Fe	45	H2	370.198	0.74	ppb	1.5	1000	
59	Co	72	NoGas	694.035	1.39	ppb	0.6	200	
60	Ni	45	He	397.821	0.8	ppb	1.7	500	
63	Cu	45	He	175949.995	351.9	ppb	1.6	500	
66	Zn	72	NoGas	492.230	0.98	ppb	4.2	1000	
75	As	45	He	27.366	0.06	ppb	7.2	200	
78	Se	45	H2	49.560	0.1	ppb	10.8	500	
98	Mo	115	NoGas	49.072	0.1	ppb	7.8	200	
107	Ag	115	NoGas	10.162	0.02	ppb	8.5	50	
111	Cd	115	NoGas	50.822	0.1	ppb	11.6	200	
118	Sn	115	NoGas	16.745	0.03	ppb	1.7	200	
121	Sb	115	NoGas	12.911	0.03	ppb	11.6	25	
125	Te	115	NoGas	44.978	0.09	ppb	17.8	200	
133	Cs	115	NoGas	48.781	0.1	ppb	4.0	200	
137	Ba	115	NoGas	52.694	0.1	ppb	4.6	500	
205	Tl	209	NoGas	102.695	0.2	ppb	8.5	200	
208	Pb	209	NoGas	55.690	0.11	ppb	6.2	500	
232	Th	209	NoGas	46.982	0.09	ppb	2.4	200	
238	U	209	NoGas	95.074	0.19	ppb	4.0	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	566123.19	0.2	98.31	60	120	
45	Sc	NoGas	2826044.47	2890531.00	0.4	102.28	60	120	
45	Sc	H2	1327985.64	1360213.90	0.5	102.43	60	120	
45	Sc	He	179429.61	187558.08	1.7	104.53	60	120	
72	Ge	NoGas	652041.19	653903.78	0.4	100.29	60	120	
72	Ge	H2	421504.49	435421.28	0.6	103.3	60	120	
72	Ge	He	124036.41	129569.75	1.3	104.46	60	120	
115	In	NoGas	1890625.99	1915786.73	0.9	101.33	60	120	
115	In	H2	1860676.25	1889686.66	0.3	101.56	60	120	
115	In	He	465165.68	486080.73	2.0	104.5	60	120	
159	Tb	NoGas	1972699.36	1999875.13	0.2	101.38	60	120	
209	Bi	NoGas	2051300.68	2073370.75	0.7	101.08	60	120	

Sample Name	L56331-05MSD1
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:35:25 PM
Sample Type	Sample
Total Dilution	500.0000
Vial Location	4109

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	62.956	0.13	ppb	4.3	200	
11	B	6	NoGas	600.086	1.2	ppb	3.3	20	
27	Al	72	NoGas	27094.985	54.19	ppb	1.1	1000	
51	V	45	He	-546.049	-1.09	ppb	3.6	200	
52	Cr	45	He	40.350	0.08	ppb	8.1	200	
55	Mn	72	NoGas	5320.647	10.64	ppb	0.6	200	
56	Fe	45	H2	338.371	0.68	ppb	1.6	1000	
59	Co	72	NoGas	713.984	1.43	ppb	0.7	200	
60	Ni	45	He	405.997	0.81	ppb	4.1	500	
63	Cu	45	He	175272.157	350.54	ppb	1.6	500	
66	Zn	72	NoGas	455.284	0.91	ppb	3.2	1000	
75	As	45	He	31.787	0.06	ppb	1.6	200	
78	Se	45	H2	56.670	0.11	ppb	4.1	500	
98	Mo	115	NoGas	47.053	0.09	ppb	3.7	200	
107	Ag	115	NoGas	8.970	0.02	ppb	9.9	50	
111	Cd	115	NoGas	50.589	0.1	ppb	7.1	200	
118	Sn	115	NoGas	12.951	0.03	ppb	2.7	200	
121	Sb	115	NoGas	9.813	0.02	ppb	4.8	25	
125	Te	115	NoGas	49.673	0.1	ppb	27.0	200	
133	Cs	115	NoGas	49.148	0.1	ppb	0.5	200	
137	Ba	115	NoGas	55.778	0.11	ppb	5.6	500	
205	Tl	209	NoGas	167.557	0.34	ppb	10.0	200	
208	Pb	209	NoGas	66.319	0.13	ppb	7.3	500	
232	Th	209	NoGas	45.121	0.09	ppb	3.0	200	
238	U	209	NoGas	94.239	0.19	ppb	1.4	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	562833.28	0.9	97.74	60	120	
45	Sc	NoGas	2826044.47	2864316.41	0.2	101.35	60	120	
45	Sc	H2	1327985.64	1359839.49	1.1	102.4	60	120	
45	Sc	He	179429.61	187388.28	2.2	104.44	60	120	
72	Ge	NoGas	652041.19	650181.85	0.6	99.71	60	120	
72	Ge	H2	421504.49	436203.03	1.6	103.49	60	120	
72	Ge	He	124036.41	129470.03	2.1	104.38	60	120	
115	In	NoGas	1890625.99	1902543.51	0.3	100.63	60	120	
115	In	H2	1860676.25	1897368.26	2.3	101.97	60	120	
115	In	He	465165.68	483765.66	2.0	104	60	120	
159	Tb	NoGas	1972699.36	1993767.42	0.9	101.07	60	120	
209	Bi	NoGas	2051300.68	2049225.96	0.6	99.9	60	120	

Sample Name	L56331-06
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:37:16 PM
Sample Type	Sample
Total Dilution	5.0000
Vial Location	4110

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	0.031	0.01	ppb	1.5	200	
11	B	6	NoGas	144.319	28.86	ppb	1.0	20	OCAL
27	Al	72	NoGas	11.828	2.37	ppb	0.7	1000	
51	V	45	He	-5.846	-1.17	ppb	5.8	200	
52	Cr	45	He	0.007	0	ppb	2.1	200	
55	Mn	72	NoGas	709.119	141.82	ppb	0.8	200	
56	Fe	45	H2	3.273	0.66	ppb	2.4	1000	
59	Co	72	NoGas	4.671	0.93	ppb	1.8	200	
60	Ni	45	He	3.316	0.66	ppb	1.9	500	
63	Cu	45	He	23.248	4.65	ppb	2.2	500	
66	Zn	72	NoGas	0.570	0.11	ppb	2.4	1000	
75	As	45	He	0.501	0.1	ppb	7.1	200	
78	Se	45	H2	23.894	4.78	ppb	2.2	500	
98	Mo	115	NoGas	52.091	10.42	ppb	1.1	200	
107	Ag	115	NoGas	-0.002	0	ppb	15.2	50	
111	Cd	115	NoGas	0.058	0.01	ppb	30.7	200	
118	Sn	115	NoGas	0.846	0.17	ppb	3.7	200	
121	Sb	115	NoGas	0.939	0.19	ppb	2.3	25	
125	Te	115	NoGas	0.027	0	ppb	45.8	200	
133	Cs	115	NoGas	0.325	0.06	ppb	0.2	200	
137	Ba	115	NoGas	15.237	3.05	ppb	1.6	500	
205	Tl	209	NoGas	1.158	0.23	ppb	3.7	200	
208	Pb	209	NoGas	0.068	0.01	ppb	7.7	500	
232	Th	209	NoGas	-0.030	-0.01	ppb	7.7	200	
238	U	209	NoGas	98.180	19.64	ppb	0.9	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	592616.69	0.1	102.91	60	120	
45	Sc	NoGas	2826044.47	3004065.30	0.6	106.3	60	120	
45	Sc	H2	1327985.64	1425333.10	0.7	107.33	60	120	
45	Sc	He	179429.61	196817.02	1.1	109.69	60	120	
72	Ge	NoGas	652041.19	679166.19	0.8	104.16	60	120	
72	Ge	H2	421504.49	448285.50	1.6	106.35	60	120	
72	Ge	He	124036.41	135677.53	1.6	109.39	60	120	
115	In	NoGas	1890625.99	1958032.02	0.2	103.57	60	120	
115	In	H2	1860676.25	1928135.83	1.2	103.63	60	120	
115	In	He	465165.68	497361.54	2.0	106.92	60	120	
159	Tb	NoGas	1972699.36	2050710.20	0.3	103.95	60	120	
209	Bi	NoGas	2051300.68	2072787.63	0.5	101.05	60	120	

Sample Name	L56331-07
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:39:07 PM
Sample Type	Sample
Total Dilution	500.0000
Vial Location	4111

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	7.390	0.02	ppb	2.9	200	
11	B	6	NoGas	752.817	1.51	ppb	2.1	20	
27	Al	72	NoGas	21142.152	42.28	ppb	0.6	1000	
51	V	45	He	-602.933	-1.21	ppb	6.7	200	
52	Cr	45	He	-13.070	-0.03	ppb	4.3	200	
55	Mn	72	NoGas	5103.838	10.21	ppb	0.8	200	
56	Fe	45	H2	160.964	0.32	ppb	3.8	1000	
59	Co	72	NoGas	629.671	1.26	ppb	1.2	200	
60	Ni	45	He	331.225	0.66	ppb	2.3	500	
63	Cu	45	He	155719.848	311.44	ppb	2.4	500	
66	Zn	72	NoGas	391.174	0.78	ppb	2.6	1000	
75	As	45	He	-23.383	-0.05	ppb	22.5	200	
78	Se	45	H2	3.806	0.01	ppb	13.4	500	
98	Mo	115	NoGas	2.537	0	ppb	53.1	200	
107	Ag	115	NoGas	-0.561	0	ppb	28.4	50	
111	Cd	115	NoGas	0.973	0	ppb	22.4	200	
118	Sn	115	NoGas	-33.256	-0.07	ppb	7.4	200	
121	Sb	115	NoGas	-0.192	0	ppb	19.6	25	
125	Te	115	NoGas	-3.686	-0.01	ppb	173.2	200	
133	Cs	115	NoGas	-0.200	0	ppb	4.6	200	
137	Ba	115	NoGas	9.296	0.02	ppb	8.8	500	
205	Tl	209	NoGas	120.042	0.24	ppb	10.4	200	
208	Pb	209	NoGas	6.147	0.01	ppb	13.9	500	
232	Th	209	NoGas	-4.912	-0.01	ppb	13.6	200	
238	U	209	NoGas	29.778	0.06	ppb	3.1	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	579332.69	0.5	100.6	60	120	
45	Sc	NoGas	2826044.47	2879966.55	0.3	101.91	60	120	
45	Sc	H2	1327985.64	1385021.33	1.5	104.29	60	120	
45	Sc	He	179429.61	192222.04	1.3	107.13	60	120	
72	Ge	NoGas	652041.19	658227.70	0.1	100.95	60	120	
72	Ge	H2	421504.49	442423.75	1.6	104.96	60	120	
72	Ge	He	124036.41	131505.55	1.1	106.02	60	120	
115	In	NoGas	1890625.99	1902399.53	0.4	100.62	60	120	
115	In	H2	1860676.25	1898525.00	2.0	102.03	60	120	
115	In	He	465165.68	495835.59	2.3	106.59	60	120	
159	Tb	NoGas	1972699.36	1978226.73	0.4	100.28	60	120	
209	Bi	NoGas	2051300.68	2045797.21	0.1	99.73	60	120	

Sample Name	L56331-08
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:40:58 PM
Sample Type	Sample
Total Dilution	500.0000
Vial Location	4112

QC Analyte Table

Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	4.836	0.01	ppb	22.2	200	
11	B	6	NoGas	502.861	1.01	ppb	0.8	20	
27	Al	72	NoGas	18583.376	37.17	ppb	0.4	1000	
51	V	45	He	-602.697	-1.2	ppb	5.9	200	
52	Cr	45	He	-14.164	-0.03	ppb	16.8	200	
55	Mn	72	NoGas	1883.559	3.77	ppb	0.7	200	
56	Fe	45	H2	647.483	1.3	ppb	1.7	1000	
59	Co	72	NoGas	274.775	0.55	ppb	3.6	200	
60	Ni	45	He	197.732	0.4	ppb	1.7	500	
63	Cu	45	He	182713.255	365.43	ppb	1.4	500	
66	Zn	72	NoGas	314.546	0.63	ppb	1.2	1000	
75	As	45	He	-24.090	-0.05	ppb	29.7	200	
78	Se	45	H2	-8.595	-0.02	ppb	11.2	500	
98	Mo	115	NoGas	-0.078	0	ppb	24.0	200	
107	Ag	115	NoGas	-0.539	0	ppb	15.1	50	
111	Cd	115	NoGas	0.121	0	ppb	47.9	200	
118	Sn	115	NoGas	-25.951	-0.05	ppb	11.3	200	
121	Sb	115	NoGas	0.464	0	ppb	11.8	25	
125	Te	115	NoGas	-0.017	0	ppb	86.6	200	
133	Cs	115	NoGas	0.103	0	ppb	9.3	200	
137	Ba	115	NoGas	26.789	0.05	ppb	12.4	500	
205	Tl	209	NoGas	138.923	0.28	ppb	9.6	200	
208	Pb	209	NoGas	2.498	0	ppb	10.7	500	
232	Th	209	NoGas	-4.365	-0.01	ppb	47.9	200	
238	U	209	NoGas	17.601	0.04	ppb	7.0	200	

QC ISTD Table

Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	570904.23	0.1	99.14	60	120	
45	Sc	NoGas	2826044.47	2876810.44	0.7	101.8	60	120	
45	Sc	H2	1327985.64	1382139.98	2.2	104.08	60	120	
45	Sc	He	179429.61	192918.54	1.0	107.52	60	120	
72	Ge	NoGas	652041.19	653902.35	0.2	100.29	60	120	
72	Ge	H2	421504.49	439008.66	2.0	104.15	60	120	
72	Ge	He	124036.41	130911.32	2.0	105.54	60	120	
115	In	NoGas	1890625.99	1899259.95	0.4	100.46	60	120	
115	In	H2	1860676.25	1882984.65	1.7	101.2	60	120	
115	In	He	465165.68	494803.42	1.4	106.37	60	120	
159	Tb	NoGas	1972699.36	1974435.62	0.5	100.09	60	120	
209	Bi	NoGas	2051300.68	2039702.14	0.5	99.43	60	120	

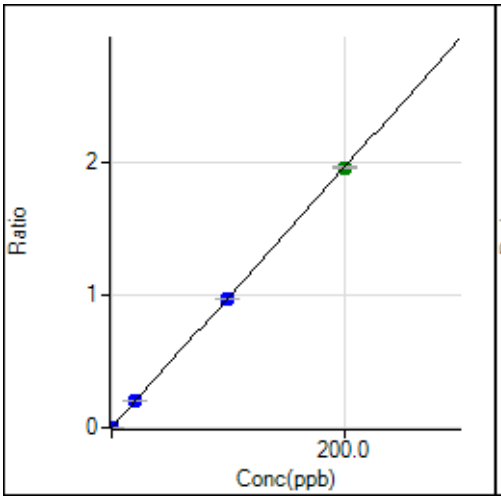
Sample Name	L56331-09
Data Path Name	C:\Agilent\ICPMH\1\DATA\wg489377.b
Acq Time	1/3/2020 7:42:49 PM
Sample Type	Sample
Total Dilution	2000.0000
Vial Location	4201

QC Analyte Table

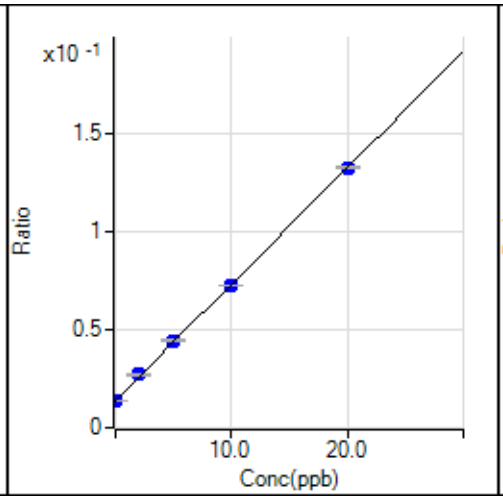
Mass	Name	ISTD	Tune Mode	Corrected Conc.	Raw Concentration	Units	CPS RSD	LDR	QC Flag
9	Be	6	NoGas	21.607	0.01	ppb	20.2	200	
11	B	6	NoGas	1145.880	0.57	ppb	2.4	20	
27	Al	72	NoGas	46821.376	23.41	ppb	1.5	1000	
51	V	45	He	-2427.877	-1.21	ppb	4.1	200	
52	Cr	45	He	-40.337	-0.02	ppb	9.1	200	
55	Mn	72	NoGas	5029.879	2.52	ppb	1.0	200	
56	Fe	45	H2	3604.346	1.8	ppb	1.4	1000	
59	Co	72	NoGas	875.801	0.44	ppb	5.1	200	
60	Ni	45	He	397.224	0.2	ppb	8.3	500	
63	Cu	45	He	504907.451	252.45	ppb	1.3	500	
66	Zn	72	NoGas	663.617	0.33	ppb	1.4	1000	
75	As	45	He	-93.207	-0.05	ppb	27.6	200	
78	Se	45	H2	-48.648	-0.02	ppb	8.8	500	
98	Mo	115	NoGas	5.282	0	ppb	21.6	200	
107	Ag	115	NoGas	-2.139	0	ppb	32.8	50	
111	Cd	115	NoGas	-0.779	0	ppb	42.6	200	
118	Sn	115	NoGas	-134.193	-0.07	ppb	16.3	200	
121	Sb	115	NoGas	-11.766	-0.01	ppb	9.5	25	
125	Te	115	NoGas	-8.810	0	ppb	100.1	200	
133	Cs	115	NoGas	-1.239	0	ppb	4.8	200	
137	Ba	115	NoGas	-10.890	0	ppb	24.3	500	
205	Tl	209	NoGas	563.354	0.28	ppb	11.0	200	
208	Pb	209	NoGas	0.215	0	ppb	12.5	500	
232	Th	209	NoGas	-21.597	-0.01	ppb	5.0	200	
238	U	209	NoGas	114.572	0.06	ppb	4.5	200	

QC ISTD Table

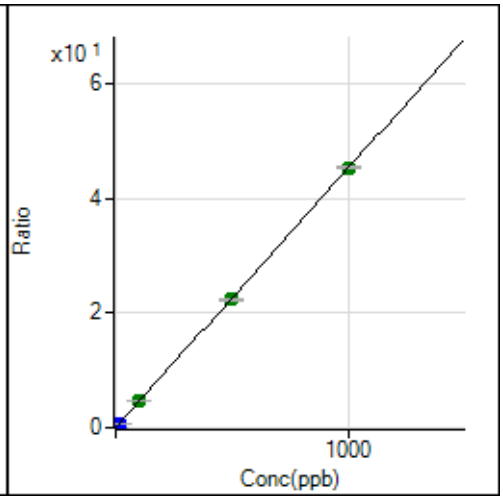
Mass	Name	Tune Mode	Reference CPS	CPS	CPS RSD	% Rec	%QC Low	%QC High	QC Flag
6	Li	NoGas	575865.9	566908.66	1.8	98.44	60	120	
45	Sc	NoGas	2826044.47	2852036.41	0.6	100.92	60	120	
45	Sc	H2	1327985.64	1362579.01	1.1	102.6	60	120	
45	Sc	He	179429.61	190324.87	0.6	106.07	60	120	
72	Ge	NoGas	652041.19	647038.26	0.7	99.23	60	120	
72	Ge	H2	421504.49	435144.54	0.8	103.24	60	120	
72	Ge	He	124036.41	130004.92	0.5	104.81	60	120	
115	In	NoGas	1890625.99	1886405.70	0.1	99.78	60	120	
115	In	H2	1860676.25	1860724.99	1.3	100	60	120	
115	In	He	465165.68	488066.44	0.9	104.92	60	120	
159	Tb	NoGas	1972699.36	1961565.06	0.7	99.44	60	120	
209	Bi	NoGas	2051300.68	2033628.81	0.7	99.14	60	120	



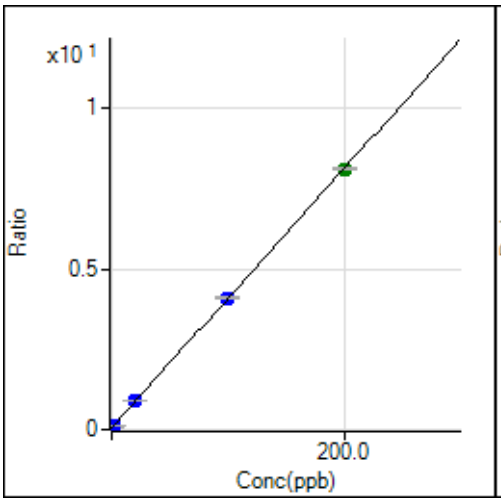
9 Be [NoGas] / ISTD: 6 Li
y = 9.799E-3 x + 1.563E-4
R 1.0000
DL 0.0005517
BEC 0.01595



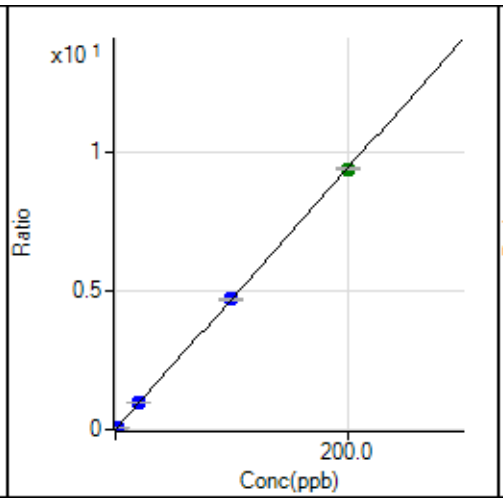
11 B [NoGas] / ISTD: 6 Li
y = 5.930E-3 x + 1.375E-2
R 0.9999
DL 0.1305
BEC 2.319



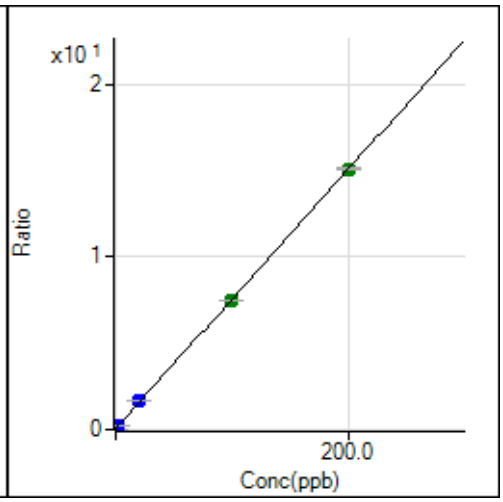
27 Al [NoGas] / ISTD: 72 Ge
y = 4.521E-2 x + 2.324E-2
R 0.9999
DL 0.08998
BEC 0.514



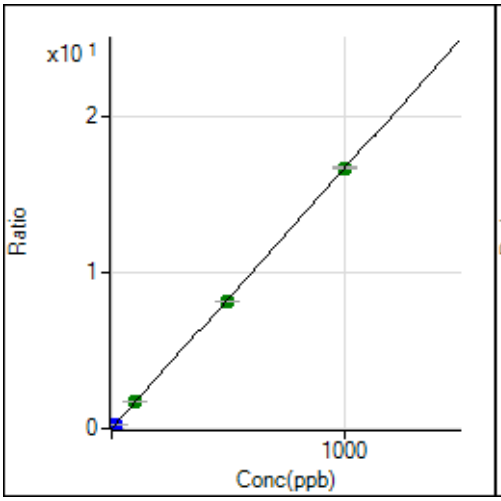
51 V [He] / ISTD: 45 Sc
y = 4.034E-2 x + 5.758E-2
R 1.0000
DL 0.07777
BEC 1.427



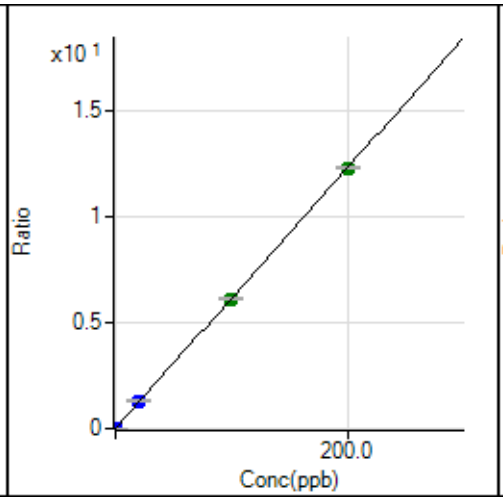
52 Cr [He] / ISTD: 45 Sc
y = 4.695E-2 x + 3.060E-3
R 1.0000
DL 0.01518
BEC 0.06517



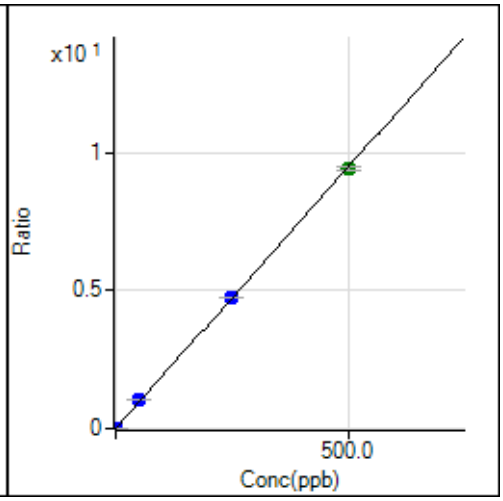
55 Mn [NoGas] / ISTD: 72 Ge
y = 7.516E-2 x + 5.173E-2
R 0.9999
DL 0.03015
BEC 0.6883



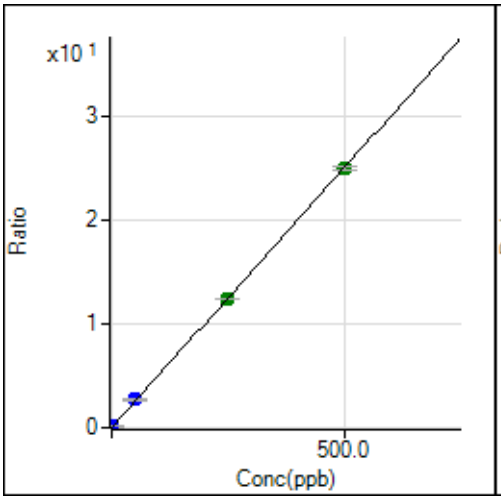
56 Fe [H2] / ISTD: 45 Sc
y = 1.662E-2 x + 4.164E-3
R 0.9999
DL 0.01276
BEC 0.2505



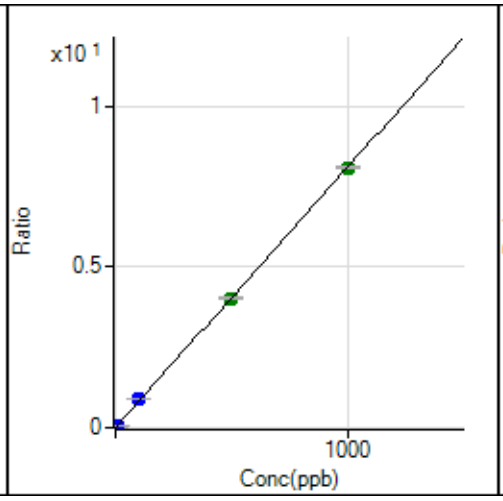
59 Co [NoGas] / ISTD: 72 Ge
y = 6.134E-2 x + 3.925E-3
R 1.0000
DL 0.01268
BEC 0.06399



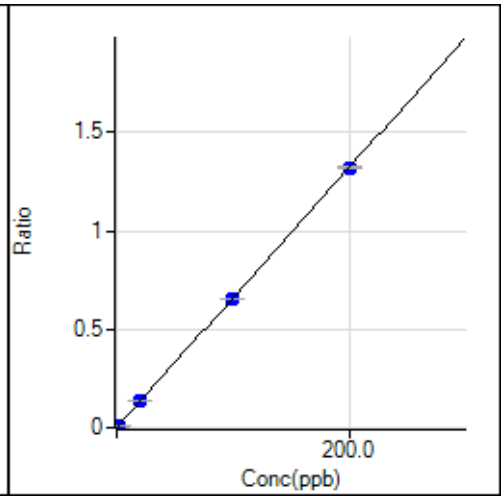
60 Ni [He] / ISTD: 45 Sc
y = 1.894E-2 x + 4.402E-4
R 1.0000
DL 0.01509
BEC 0.02324



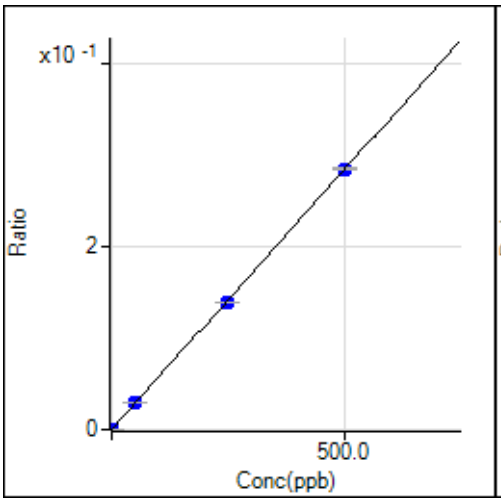
63 Cu [He] / ISTD: 45 Sc
y = 5.011E-2 x + 4.006E-3
R 0.9999
DL 0.0133
BEC 0.07995



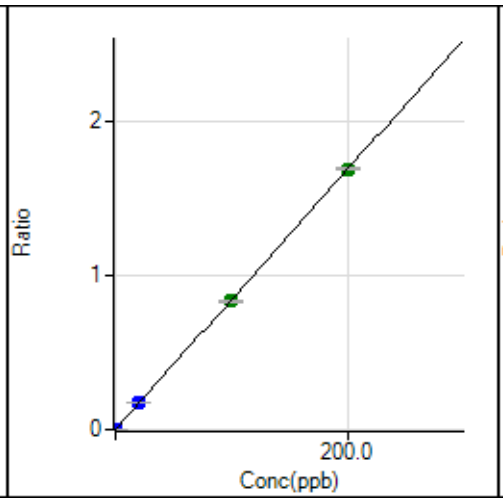
66 Zn [NoGas] / ISTD: 72 Ge
y = 8.082E-3 x + 4.804E-3
R 1.0000
DL 0.0419
BEC 0.5944



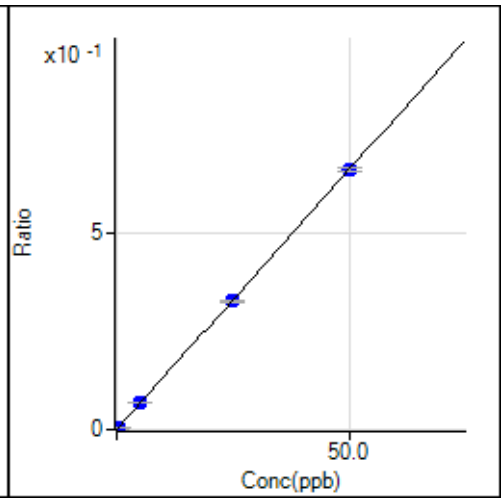
75 As [He] / ISTD: 45 Sc
y = 6.597E-3 x + 4.199E-4
R 1.0000
DL 0.01496
BEC 0.06365



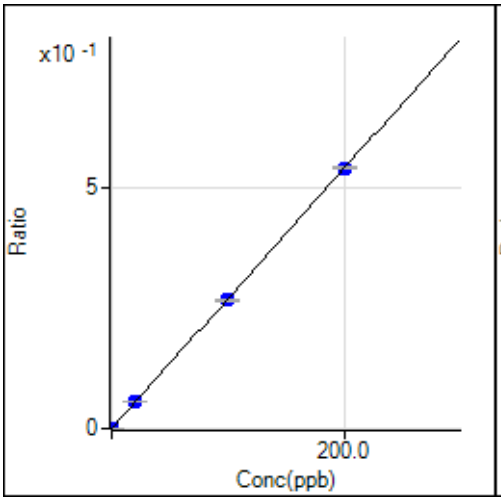
78 Se [H2] / ISTD: 45 Sc
y = 5.686E-4 x + 5.198E-5
R 0.9999
DL 0.01845
BEC 0.09141



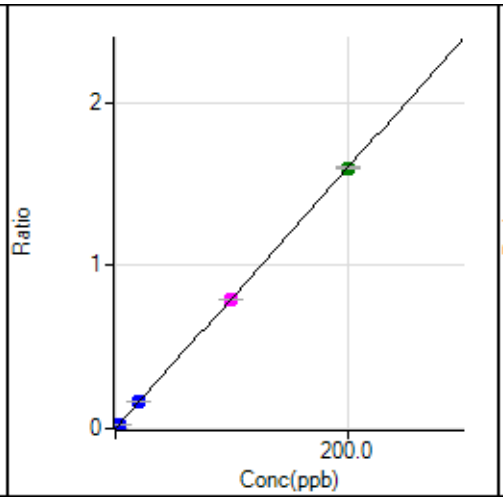
98 Mo [NoGas] / ISTD: 115 In
y = 8.454E-3 x + 3.491E-5
R 0.9999
DL 0.005439
BEC 0.004129



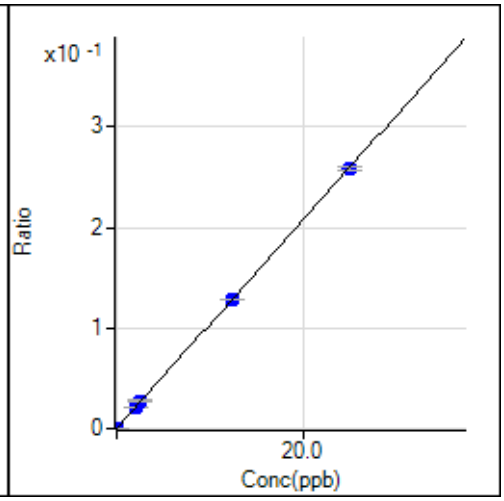
107 Ag [NoGas] / ISTD: 115 In
y = 1.317E-2 x + 2.764E-5
R 1.0000
DL 0.002598
BEC 0.002098



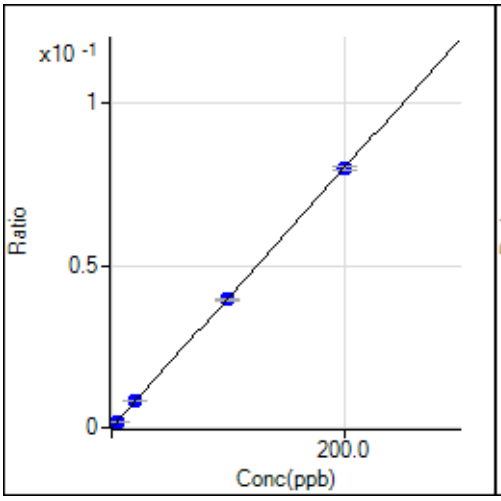
111 Cd [NoGas] / ISTD: 115 In
y = 2.696E-3 x + 1.326E-5
R 1.0000
DL 0.006064
BEC 0.004917



118 Sn [NoGas] / ISTD: 115 In
y = 7.989E-3 x + 7.451E-4
R 1.0000
DL 0.008068
BEC 0.09327



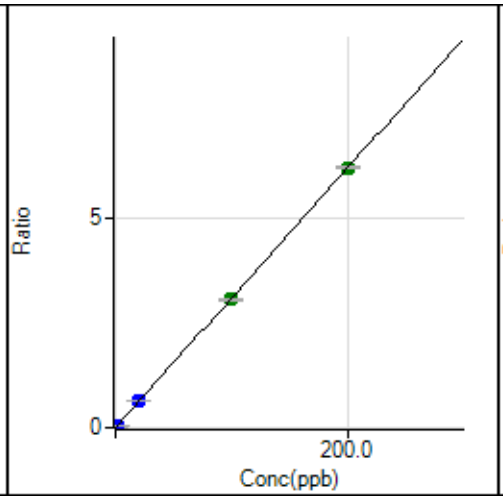
121 Sb [NoGas] / ISTD: 115 In
y = 1.036E-2 x + 9.806E-5
R 1.0000
DL 0.00213
BEC 0.009465



125 Te [NoGas] / ISTD: 115 In

y = 3.993E-4 x + 3.525E-6

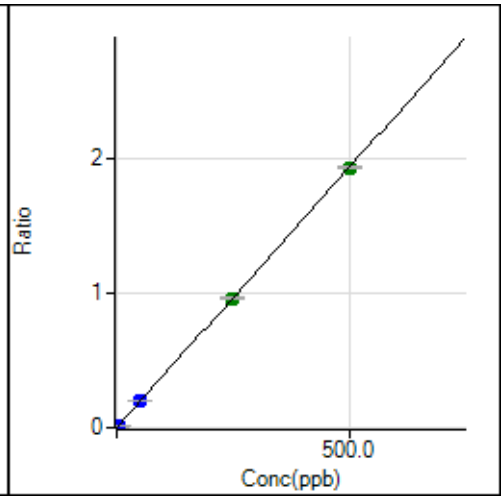
R	0.9999
DL	0.02617
BEC	0.008827



133 Cs [NoGas] / ISTD: 115 In

y = 3.092E-2 x + 3.231E-4

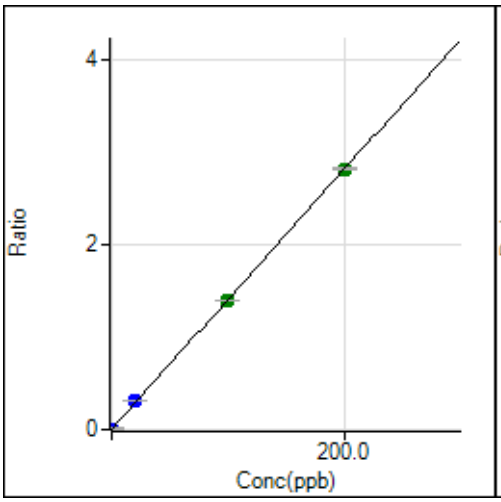
R	0.9999
DL	0.001296
BEC	0.01045



137 Ba [NoGas] / ISTD: 115 In

y = 3.871E-3 x + 6.878E-5

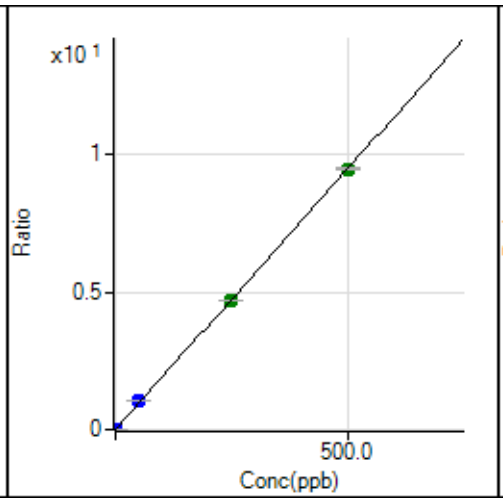
R	1.0000
DL	0.002944
BEC	0.01777



205 Tl [NoGas] / ISTD: 209 Bi

y = 1.407E-2 x + 3.565E-3

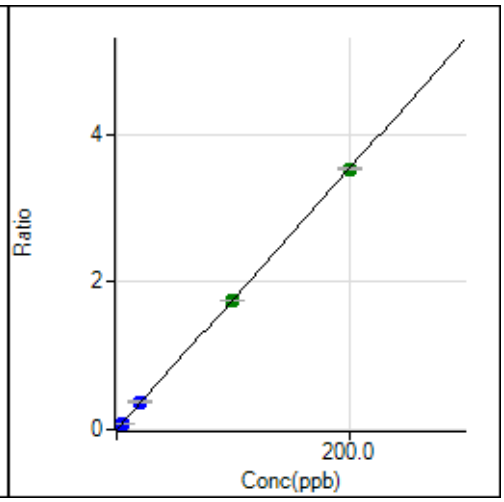
R	0.9999
DL	0.02383
BEC	0.2533



208 Pb [NoGas] / ISTD: 209 Bi

y = 1.893E-2 x + 1.604E-3

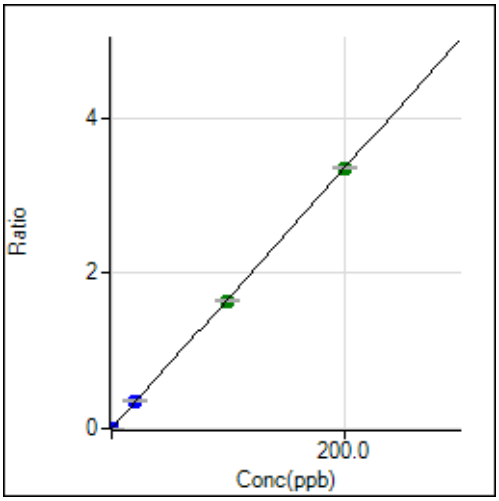
R	0.9999
DL	0.01478
BEC	0.08472



232 Th [NoGas] / ISTD: 209 Bi

y = 1.764E-2 x + 2.232E-4

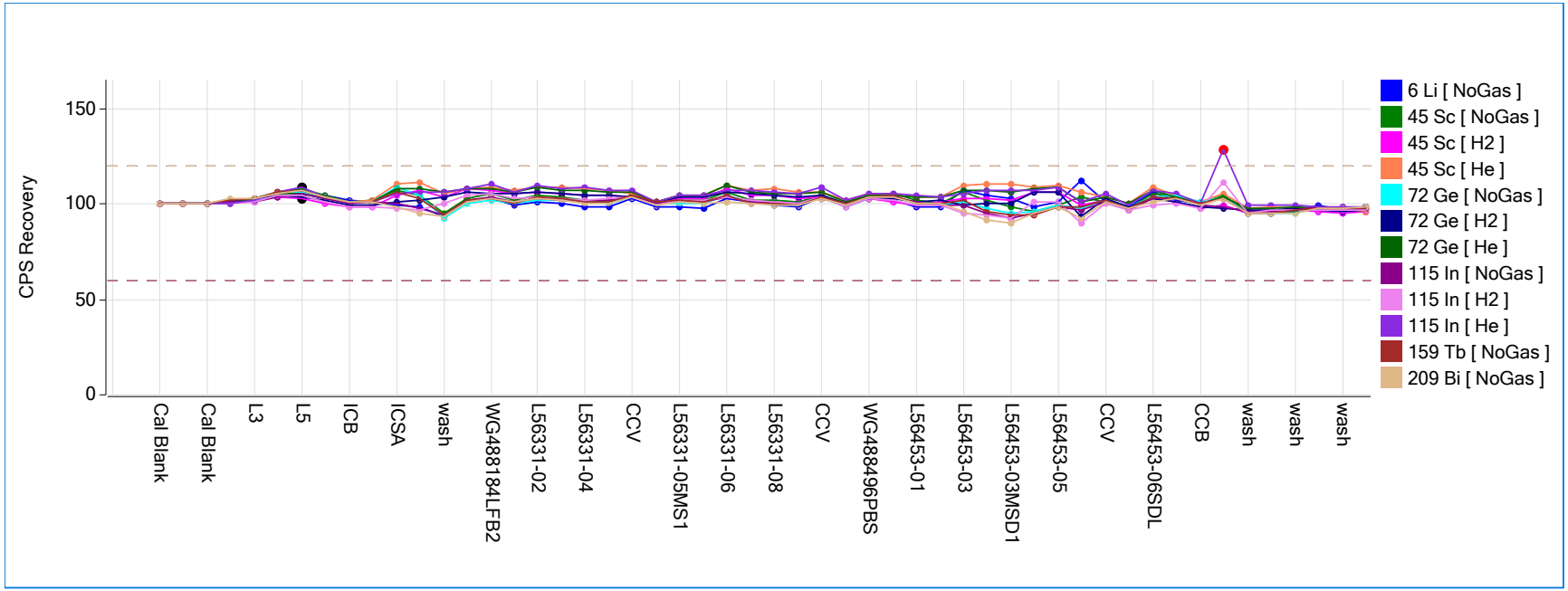
R	1.0000
DL	0.001474
BEC	0.01266



238 U [NoGas] / ISTD: 209 Bi

y = 1.673E-2 x + 7.533E-5

R	0.9999
DL	0.001077
BEC	0.004503


CPS Recovery
150
100
50
0
Cal Blank
Cal Blank
L3
L5
ICB
ICSA
wash
WG488184LFB2
L56331-02
L56331-04
CCV
L56331-05MS1
L56331-06
L56331-08
CCV
WG488496PBS
L56453-01
L56453-03
L56453-03MSD1
L56453-05
CCV
L56453-06SDL
CCB
wash
wash
wash
6 Li [NoGas]
45 Sc [NoGas]
45 Sc [H2]
45 Sc [He]
72 Ge [NoGas]
72 Ge [H2]
72 Ge [He]
115 In [NoGas]
115 In [H2]
115 In [He]
159 Tb [NoGas]
209 Bi [NoGas]

EPA 6020 Tune Check Report

Acq/Data Batch C:\Agilent\ICPMH\1\DATA\6020AMU-03_Jan_2020-07_52_14.b

Acq. Date-Time 1/3/2020 8:25:13 AM

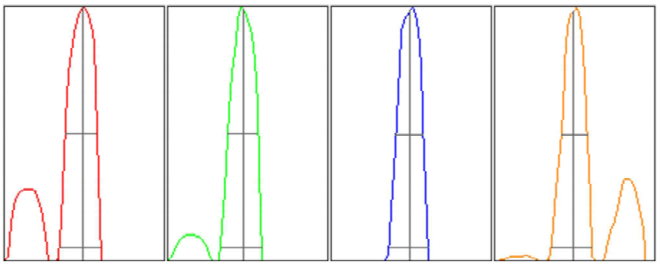
Instrument Name G8403A JP16281462

Mass	Conc. [ug/l]	Count	CPS	RSD%	RSD% (Required)	RSD% (Flag)
7		7013	70128.13	2.244	5.000	
59		15277	152768.65	2.550	5.000	
115		26700	266998.34	2.038	5.000	
205		11017	110166.74	2.094	5.000	

Oxide 156 / 140 1.200 %

Doubly Charged 70 / 140 8.136 %

Resolution/Axis



Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)
7	7145.07	7.00	6.90 - 7.10	
59	15815.94	58.95	58.90 - 59.10	
115	26120.10	115.00	114.90 - 115.10	
205	11182.36	205.00	204.90 - 205.10	

Mass	W-50%	W-5%	W-5% (Required)	W-5% (Flag)
7	0.61	0.777	0.900	
59	0.57	0.774	0.900	
115	0.52	0.734	0.900	
205	0.50	0.765	0.900	

Integration Time [sec] 0.1

Acquisition Time [sec] 30.02

Calibration Standards

6020/200.8 Stock #1: MS191209-1 SCN
6020/200.8 Stock #2: MS191209-2 SCN
6020/200.8 Stock #3: MS191231-1 SCN

PQV STD: MS191231-5
Exp. 1/14/2020

ICPMS5/6 INT STD: MS190612-2
Exp. 1/26/2020

ICPMS7 INT STD: MS190613-1
Exp. 1/26/2020

Nitric Acid: 60325

Hydrochloric Acid: 59898

VERIFIED: bsu 1/3/20

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Metals Analysis

WG489377 **ICPMS MWMT**

Sample	Date	SCN	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cs	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Te	Th	Tl	U	V	Zn
WG489377ICV	01/03/20 19:05	MS191231-8											X		X												
WG489377ICB	01/03/20 19:07												X		X												
WG489377PQV	01/03/20 19:09	MS191231-5											X		X												
WG489377ICSA	01/03/20 19:11												X		X												
WG489377ICSAB	01/03/20 19:13	MS191119-7											X		X												
WG488184PBS	01/03/20 19:16		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WG488184LFB2	01/03/20 19:18	MS191119-5											X		X												
L56331-01	01/03/20 19:20												X														
L56331-02	01/03/20 19:22												X		X												
L56331-03	01/03/20 19:24												X														
L56331-04	01/03/20 19:26												X		X												
L56331-05	01/03/20 19:28												X		X												
WG489377CCV1	01/03/20 19:29	MS191231-2											X		X												
WG489377CCB1	01/03/20 19:31		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L56331-05MS1	01/03/20 19:33	MS191119-5											X		X												
L56331-05MSD1	01/03/20 19:35	MS191119-5											X		X												
L56331-06	01/03/20 19:37												X														
L56331-07	01/03/20 19:39												X		X												
L56331-08	01/03/20 19:40												X														
L56331-09	01/03/20 19:42												X														
WG489377CCV2	01/03/20 19:44	MS191231-2											X		X												
WG489377CCB2	01/03/20 19:46		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WG488496PBS	01/03/20 19:48		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WG488496LFB2	01/03/20 19:50	MS191119-5											X		X												
L56453-01	01/03/20 19:52												X														
L56453-02	01/03/20 19:53												X														

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Metals Analysis

WG489377 **ICPMS MWMT**

Sample	Date	SCN	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cs	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Te	Th	Tl	U	V	Zn
L56453-03	01/03/20 19:55												X														
L56453-03MS1	01/03/20 19:57	MS191119-5											X		X												
L56453-03MSD1	01/03/20 19:59	MS191119-5											X		X												
L56453-04	01/03/20 20:01												X		X												
L56453-05	01/03/20 20:03												X		X												
L56453-06	01/03/20 20:05												X														
WG489377CCV3	01/03/20 20:06	MS191231-2											X		X												
WG489377CCB3	01/03/20 20:08		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L56453-06SDL	01/03/20 20:10												X		X												
WG489377CCV4	01/03/20 20:12	MS191231-2											X		X												
WG489377CCB4	01/03/20 20:14		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WG489377ULRV	01/03/20 20:16	MS191231-3											X		X												

L56331-2006231417

MS Total Hot Plate

QC List Type: I-X-THP
QCListMatClass: LIQUID
Bench Sheet List: I-X-THP
QC Ref: NOQC
Group ID: IP-G-DIG-THP-MS-MWMT
Method Ref: M6020 ICP-MS
SOP Ref: SOPII021

WG488955

ACZ Laboratories, Inc

Instrument ID: METALSDIG
Analyst: mfm
ACZ Dept: 30
Create Date: 12/28/2019 9:52
Start Date/Time: 12/28/2019 11:10
End Date/Time: 12/28/2019 15:35

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	AG MS MWMT	AS MS MWMT	BE MS MWMT	CD MS MWMT	CO MS MWMT	CR MS MWMT	CU MS MWMT	MN MS MWMT	MO MS MWMT	NI MS MWMT	PB MS MWMT	SB MS MWMT	SE MS MWMT	TH MS MWMT	TL MS MWMT	U MS MWMT	V MS MWMT	ZN MS MWMT	SC N Volume (mL)	Sample Volume (mL)	Final Volume (mL)	Comments
1	WG488184PBS	NONE	mwmt		12/28/19 11:10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
2	L56331-01	STSB32_0.5-3	mwmt		12/28/19 11:22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
3	L56331-02	STSB32_6-15	mwmt		12/28/19 11:34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
4	L56331-03	STSB34_0.5-3	mwmt		12/28/19 11:46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
5	L56331-04	STSB34_6-15	mwmt		12/28/19 11:58	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
6	L56331-05	STSB33_0.5-3	mwmt		12/28/19 12:10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
7	L56331-05MS1	MS191119-5	mwmt		12/28/19 12:22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0.25	50	50	
8	L56331-05MSD1	MS191119-5	mwmt		12/28/19 12:34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0.25	50	50	
9	L56331-06	STSB33_6-15	mwmt		12/28/19 12:46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
10	L56331-07	STSB33-FD_0.5-3	mwmt		12/28/19 12:58	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
11	L56331-08	STSB35_0.5-3	mwmt		12/28/19 13:10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
12	L56331-09	STSB35_6-15	mwmt		12/28/19 13:22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
13	WG488184LFB2	MS191119-5	mwmt		12/28/19 13:34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0.25	50	50	
14	WG488496PBS	NONE	mwmt		12/28/19 13:46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
15	L56453-01	STSB05_0.5-3	mwmt		12/28/19 13:58	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
16	L56453-02	STSB05_6-15	mwmt		12/28/19 14:10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
17	L56453-03	STSB05_45-55	mwmt		12/28/19 14:22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
18	L56453-03MS1	MS191119-5	mwmt		12/28/19 14:34	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0.25	50	50	
19	L56453-03MSD1	MS191119-5	mwmt		12/28/19 14:46	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0.25	50	50	
20	L56453-04	STSB05_66-71	mwmt		12/28/19 14:58	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	

Report Comments: _____

Internal Comments _____

AREV: MFM 12/31/19
Initials, Date

SREV: 12-31-19
Initials, Date

12/31/2019 11:36:52 AM 10120

MS Total Hot Plate

QC List Type: I-X-THP
QCListMatClass: LIQUID
Bench Sheet List: I-X-THP
QC Ref: NOQC
Group ID: IP-G-DIG-THP-MS-MWMT
Method Ref: M6020 ICP-MS
SOP Ref: SOPII021

WG488955

ACZ Laboratories, Inc

Instrument ID: METALSDIG
Analyst: mfm
ACZ Dept: 30
Create Date: 12/28/2019 9:52
Start Date/Time: 12/28/2019 11:10
End Date/Time: 12/28/2019 15:35

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	AG MS MMWMT	AS MS MMWMT	BE MS MMWMT	CD MS MMWMT	CO MS MMWMT	CR MS MMWMT	CU MS MMWMT	MN MS MMWMT	MO MS MMWMT	NI MS MMWMT	PB MS MMWMT	SB MS MMWMT	SE MS MMWMT	TH MS MMWMT	TL MS MMWMT	U MS MMWMT	V MS MMWMT	ZN MS MMWMT	SCN Volume (mL)	Sample Volume (mL)	Final Volume (mL)	Comments
21	L56453-05	STSB05_76-81	mwmt		12/28/19 15:11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
22	L56453-06	STSB06_0.5-3	mwmt		12/28/19 15:23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		50	50	
23	WG488496LFB2	MS191119-5	mwmt		12/28/19 15:35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0.25	50	50	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MSD1	ICPMS Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56453-01	BUCKET ||
L56453-02	BUCKET ||
L56453-03	BUCKET ||
L56453-03MS1	ICPMS Spike
L56453-03MSD1	ICPMS Spike
L56453-04	BUCKET ||
L56453-05	BUCKET ||
L56453-06	BUCKET ||
WG488184LFB2	ICPMS LFB
WG488496LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/31/2019 11:36:52 AM 10120

MS Total Hot Plate

QC List Type: I-X-THP
QCListMatClass: LIQUID
Bench Sheet List: I-X-THP
QC Ref: NOQC
Group ID: IP-G-DIG-THP-MS-MWMT
Method Ref: M6020 ICP-MS
SOP Ref: SOPII021

WG488955

ACZ Laboratories, Inc

Instrument ID: METALSDIG
Analyst: MFM
ACZ Dept: 30
Create Date: 12/28/2019 9:52
Start Date/Time: 1 11:5
End Date/Time: 1 3:35

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	AG MS MMWMT	AS MS MMWMT	BE MS MMWMT	CD MS MMWMT	CO MS MMWMT	CR MS MMWMT	CU MS MMWMT	MN MS MMWMT	MO MS MMWMT	NI MS MMWMT	PB MS MMWMT	SB MS MMWMT	SE MS MMWMT	TH MS MMWMT	TL MS MMWMT	U MS MMWMT	V MS MMWMT	ZN MS MMWMT	SCN Volume (mL)	Sample Volume (mL)	Final Volume (mL)	Comments
1	WG488184PBS	NONE				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
2	L56331-01	STSB32_0.5-3				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
3	L56331-02	STSB32_6-15				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
4	L56331-03	STSB34_0.5-3				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
5	L56331-04	STSB34_6-15				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
6	L56331-05	STSB33_0.5-3				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
7	L56331-05MS1	MS191119-5				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
8	L56331-05MSD1	MS191119-5				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
9	L56331-06	STSB33_6-15				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
10	L56331-07	STSB33-FD_0.5-3				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
11	L56331-08	STSB35_0.5-3				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
12	L56331-09	STSB35_6-15				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
13	WG488184LFB2	MS191119-5				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
14	WG488496PBS	NONE				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
15	L56453-01	STSB05_0.5-3				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
16	L56453-02	STSB05_6-15				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
17	L56453-03	STSB05_45-55				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
18	L56453-03MS1	MS191119-5				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
19	L56453-03MSD1	MS191119-5				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
20	L56453-04	STSB05_66-71				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
21	L56453-05	STSB05_76-81				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
22	L56453-06	STSB06_0.5-3				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/28/2019 9:52:59 AM 10120

MS Total Hot Plate

WG488955

ACZ Laboratories, Inc

QC List Type: I-X-THP
QCListMatClass: LIQUID
Bench Sheet List: I-X-THP
QC Ref: NOQC
Group ID: IP-G-DIG-THP-MS-MWMT
Method Ref: M6020 ICP-MS
SOP Ref: SOPII021

Instrument ID: METALSDIG
Analyst:
ACZ Dept: 30
Create Date: 12/28/2019 9:52
Start Date/Time:
End Date/Time:

L56331-2006231417

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	AG MS MMW MT	AS MS MMW MT	BE MS MMW MT	CD MS MMW MT	CO MS MMW MT	CR MS MMW MT	CU MS MMW MT	MN MS MMW MT	MO MS MMW MT	NI MS MMW MT	PB MS MMW MT	SB MS MMW MT	SE MS MMW MT	TH MS MMW MT	TL MS MMW MT	U MS MMW MT	V MS MMW MT	ZN MS MMW MT	SCN Volume (mL)	Sample Volume (mL)	Final Volume (mL)	Comments
23	WG488496LFB2	MS191119-5				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MSD1	ICPMS Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56453-01	BUCKET ||
L56453-02	BUCKET ||
L56453-03	BUCKET ||
L56453-03MS1	ICPMS Spike
L56453-03MSD1	ICPMS Spike
L56453-04	BUCKET ||
L56453-05	BUCKET ||
L56453-06	BUCKET ||
WG488184LFB2	ICPMS LFB
WG488496LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/28/2019 9:53:00 AM 10120

ACZ Laboratories, Inc.

METALS PREP REVIEW CHECKLIST

AREV:	MFM
Date:	12/31/2019
SREV:	[illegible]
Date:	12-31-19

Work Group:	488955
Sample Type:	MWMT
Prep Date:	12/28/2019
Analyst:	MFM

	N/A	Yes	No
1.) Are all dilutions correct in LIMS and documented on the bench sheet ?		✓	
2.) Is any sample prepared on dilution appropriately "D" qualified?	✓		
3.) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?	✓		
4.) Are all initial and final sample volumes correct in LIMS ?		✓	
5.) Is the correct SCN entered for each spike and control standard (LFB or LCSW) ?		✓	
6.) Are all SCN volumes correct in LIMS ?		✓	
7.) Are all errors properly corrected (i.e. single-line crossout, dated & initialed) ?		✓	
8.) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS ?		✓	

For any item listed above that is checked "No" state the problem and corrective action / resolution in the sections below.

QC/Sample ID	Problem	Corrective action

Disposable Vessel Lot #*: 1906257

Nitric acid PCN: 60420

Hydrochloric acid PCN: 59570

Digest Temp: 94 °C

Hot Block ID: DEENA 2

Comments:

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488955

Date Reported: 31-Dec-19
Run ID: R1766196
Date Analyzed: 28-Dec-19
ICAL Workgroup:
Instrument ID: METALSDIG

WG488184PBS

Tag: 1 Measured: 12/28/2019 11:10:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-01

Tag: 1 Measured: 12/28/2019 11:22:03 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56331-02

Tag: 1 Measured: 12/28/2019 11:34:06 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56331-03

Tag: 1 Measured: 12/28/2019 11:46:09 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56331-04

Tag: 1 Measured: 12/28/2019 11:58:12 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56331-05

Tag: 1 Measured: 12/28/2019 12:10:15 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56331-05MS1

Tag: Measured: 12/28/2019 12:22:18 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	SCN VOLUME	PREP	0.25	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-05MSD1

Tag: Measured: 12/28/2019 12:34:21 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	SCN VOLUME	PREP	0.25	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-06 Tag: 1 Measured: 12/28/2019 12:46:24 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56331-07 Tag: 1 Measured: 12/28/2019 12:58:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56331-08 Tag: 1 Measured: 12/28/2019 1:10:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56331-09 Tag: 1 Measured: 12/28/2019 1:22:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

WG488184LFB2 Tag: Measured: 12/28/2019 1:34:36 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	SCN VOLUME	PREP	0.25	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

WG488496PBS Tag: 1 Measured: 12/28/2019 1:46:39 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56453-01 Tag: 1 Measured: 12/28/2019 1:58:42 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56453-02 Tag: 1 Measured: 12/28/2019 2:10:45 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56453-03 Tag: 1 Measured: 12/28/2019 2:22:48 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56453-03MS1

Tag: Measured: 12/28/2019 2:34:51 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	SCN VOLUME	PREP	0.25	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56453-03MSD1

Tag: Measured: 12/28/2019 2:46:54 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	SCN VOLUME	PREP	0.25	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56453-04

Tag: 1 Measured: 12/28/2019 2:58:57 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56453-05

Tag: 1 Measured: 12/28/2019 3:11:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

L56453-06

Tag: 1 Measured: 12/28/2019 3:23:03 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IS-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IS-MWMT	50	1		mL	++					

WG488496LFB2

Tag: Measured: 12/28/2019 3:35:06 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	SCN VOLUME	PREP	0.25	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-2006231417

ICP MWMT

QC List Type: QC-ICP-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICP-6010
QC Ref: MA-ICP-SOIL-6010
Group ID: MA-G-ICP_-MWMT
Method Ref: M6010B
SOP Ref: SOPII012

WG488736

ACZ Laboratories, Inc

Instrument ID: ICP7 8 JLW 12/26/19
Analyst: KJA
ACZ Dept: 33
Create Date: 12/23/2019 10:25
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	AL MMWMT	BA MMWMT	B MMWMT	CA MMWMT	FE MMWMT	K MMWMT	LI MMWMT	MG MMWMT	NA MMWMT	P MMWMT	SN MMWMT	SR MMWMT	TI MMWMT	Dilution
1	WG488736ICV	II191209-2			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
2	WG488736ICB	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
3	WG488736PQV	II191202-2			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
4	WG488736ICSAB	II191127-4			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
5	WG488736ULRV	II191113-1			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
6	WG488184PBS	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
7	L56331-01	STSB32_0.5-3			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
8	L56331-02	STSB32_6-15			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
9	L56331-03	STSB34_0.5-3			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
10	L56331-04	STSB34_6-15			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
11	L56331-05	STSB33_0.5-3			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
12	L56331-05MS2	II191204-3			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
13	WG488736CCV1	II191204-1			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
14	WG488736CCB1	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
15	L56331-05MSD2	II191204-3			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
16	L56331-06	STSB33_6-15			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
17	L56331-07	STSB33-FD_0.5-3			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
18	L56331-08	STSB35_0.5-3			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
19	L56331-09	STSB35_6-15			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
20	L56331-09SDL	NONE			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
21	WG488184LFB1	II191204-3			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
22	WG488736CCV2	II191204-1			1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1

KJA 12/23/19

Report Comments:

Internal Comments

AREV: JLW 12/26/19
Initials, Date

SREV: 12-26-19
Initials, Date

12/23/2019 10:26:05 AM 10120

L56331-2006231417

ICP MWMT

QC List Type: QC-ICP-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICP-6010
QC Ref: MA-ICP-SOIL-6010
Group ID: MA-G-ICP_-MWMT
Method Ref: M6010B
SOP Ref: SOPII012

WG488736

ACZ Laboratories, Inc

Instrument ID: ICP7
Analyst:
ACZ Dept: 33
Create Date: 12/23/2019 10:25
Start Date/Time:
End Date/Time:

SE Q	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	AL MW MT	BA MW MT	B MW MT	CA MW MT	FE MW MT	K MW MT	LI MW MT	MG MW MT	NA MW MT	P MW MT	SN MW MT	SR MW MT	TI MW MT	Dilution
23	WG488736CCB2	NONE			1			✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	1

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS2	ICP Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184LFB1	ICP LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/23/2019 10:26:05 AM 10120

ACZ Laboratories, Inc.

ICP DATA REVIEW CHECKLIST

Reviewed By: JLW
Date: 12/26/19

Approved By: SP
Date: 12-26-19

Work Group: 488736
Sample Type: MW MT
Analysis Date: 12/23/19
Analyst: KJR

Instrument Checklist

	Yes	No	N / A
1) Is the correct run date associated with the workgroup?	✓		
2) Are all of the QC critera listed in LIMS within specified limits? **		✓	
3) Are all samples requiring re-analysis / re-digestion at REDO / REDX status?	✓		
4) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
5) Is a current standard/reagent form attached to the workgroup?	✓		
6) Have all dilutions performed at the bench been checked off on the benchsheet?			✓
7) Has any sample on a 2x dilution been checked for proper mixing (review raw data)?			✓
8) Is any sample analyzed on dilution appropriately "D" qualified (not required for o-cal, EC, TDS)?			✓
9) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?	✓		
10) Are any samples that have recoveries outside of limits for the Yttrium Internal Standard set to REDO?			✓
11) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

For any item listed above that is checked "No" state the problem and corrective action / resolution in the sections below.

QC/Sample ID	Analytical Problem	Corrective action
PBS	B ↑	Redo
	Ca ↑	Ba
	Na ↑	Ba / Redo
LFB1	B	Redo
L56331-01	P LOW	Redo 2x
02	Ca ~~LOW~~ Ocal JLW 12/24/19	Redo 2x
03		
04		
L56331-05	MSD2 Al ↑	M3
L56331-07	Ca Ocal	Redo 2x
08		
L56331-09	P LOW	Redo 2x
L56331-09 SDL	B	Redo
	Li	2g
	Ti	2g

FRMII009.06.13.14

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488736

Date Reported: 26-Dec-19
Run ID: R1765694
Date Analyzed: 23-Dec-19
ICAL Workgroup:
Instrument ID: ICP8

WG488736ICV

Tag:

Measured: 12/23/2019 8:16:25 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND	2.011	1		mg/L	++	0.05	0.3			
SREV	ALUMINUM	REC	101	1		%	++	0.05	0.3			
SREV	ALUMINUM	RSD	1.014	1		mg/L	++	0.05	0.25			
SREV	ANTIMONY	FOUND	3.951	1		mg/L	++	0.03	0.2			
SREV	ANTIMONY	REC	99	1		%	++	0.03	0.2			
SREV	ANTIMONY	RSD	0.7835	1		mg/L	++	0.03	0.15			
SREV	BARIUM	FOUND	1.999	1		mg/L	++	0.007	0.04			
SREV	BARIUM	REC	100	1		%	++	0.007	0.04			
SREV	BARIUM	RSD	0.4026	1		mg/L	++	0.007	0.035			
SREV	BORON	FOUND	2.026	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	101	1		%	++	0.02	0.1			
SREV	BORON	RSD	0.7951	1		mg/L	++	0.02	0.1			
SREV	CALCIUM	FOUND	98.85	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	99	1		%	++	0.1	0.5			
SREV	CALCIUM	RSD	0.1743	1		mg/L	++	0.1	0.5			
FAIL	IRON	FOUND	1.953	1		mg/L	++	0.03	0.08			
SREV	IRON	FOUND	1.932	1		mg/L	++	0.03	0.08			
FAIL	IRON	REC	98	1		%	++	0.03	0.08			
SREV	IRON	REC	97	1		%	++	0.03	0.08			
FAIL	IRON	RSD	0.2051	1		mg/L	++	0.03	0.075			
SREV	IRON	RSD	0.437	1		mg/L	++	0.03	0.075			
SREV	LITHIUM	FOUND	1.979	1		mg/L	++	0.008	0.04			
SREV	LITHIUM	REC	99	1		%	++	0.008	0.04			
SREV	LITHIUM	RSD	0.3167	1		mg/L	++	0.008	0.04			
SREV	MAGNESIUM	FOUND	97.09	1		mg/L	++	0.2	1			
SREV	MAGNESIUM	REC	97	1		%	++	0.2	1			
SREV	MAGNESIUM	RSD	0.2775	1		mg/L	++	0.2	1			
SREV	PHOSPHORUS	FOUND	4.99	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	100	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	RSD	0.3191	1		mg/L	++	0.1	0.5			
SREV	POTASSIUM	FOUND	19.88	1		mg/L	++	0.2	1			
SREV	POTASSIUM	REC	99	1		%	++	0.2	1			
SREV	POTASSIUM	RSD	0.699	1		mg/L	++	0.2	1			
SREV	SODIUM	FOUND	99.29	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	99	1		%	++	0.2	1			
SREV	SODIUM	RSD	0.2054	1		mg/L	++	0.2	1			
SREV	STRONTIUM	FOUND	1.988	1		mg/L	++	0.009	0.05			
SREV	STRONTIUM	REC	99	1		%	++	0.009	0.05			
SREV	STRONTIUM	RSD	0.7695	1		mg/L	++	0.009	0.045			
SREV	TIN	FOUND	2.005	1		mg/L	++	0.04	0.2			
SREV	TIN	REC	100	1		%	++	0.04	0.2			
SREV	TIN	RSD	0.2444	1		mg/L	++	0.04	0.2			
SREV	TITANIUM	FOUND	1.969	1		mg/L	++	0.005	0.03			
SREV	TITANIUM	REC	98	1		%	++	0.005	0.03			
SREV	TITANIUM	RSD	0.1338	1		mg/L	++	0.005	0.025			

SREV	YTTRIUM	REC	96.33	1		%	++	0.001	0.005

WG488736ICB

Tag:

Measured: 12/23/2019 8:20:07 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND		1	U	mg/L	++	0.05	0.3			
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.03	0.2			
SREV	BARIUM	FOUND		1	U	mg/L	++	0.007	0.04			
SREV	BORON	FOUND		1	U	mg/L	++	0.02	0.1			
SREV	CALCIUM	FOUND		1	U	mg/L	++	0.1	0.5			
FAIL	IRON	FOUND		1	U	mg/L	++	0.03	0.08			
SREV	IRON	FOUND		1	U	mg/L	++	0.03	0.08			
SREV	LITHIUM	FOUND		1	U	mg/L	++	0.008	0.04			
SREV	MAGNESIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	SODIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	STRONTIUM	FOUND		1	U	mg/L	++	0.009	0.05			
SREV	TIN	FOUND		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	FOUND		1	U	mg/L	++	0.005	0.03			
SREV	YTTRIUM	REC	98.82	1		%	++	0.001	0.005			

WG488736PQV

Tag:

Measured: 12/23/2019 8:24:04 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND	0.269	1	B	mg/L	++	0.05	0.3			
SREV	ALUMINUM	REC	107	1	B	%	++	0.05	0.3			
SREV	BARIUM	FOUND	0.0378	1	B	mg/L	++	0.007	0.04			
SREV	BARIUM	REC	108	1	B	%	++	0.007	0.04			
SREV	BORON	FOUND	0.121	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	121	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	0.55	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	110	1		%	++	0.1	0.5			
SREV	IRON	FOUND	0.074	1	B	mg/L	++	0.03	0.08			
FAIL	IRON	FOUND	0.079	1	B	mg/L	++	0.03	0.08			
SREV	IRON	REC	98	1	B	%	++	0.03	0.08			
FAIL	IRON	REC	105	1	B	%	++	0.03	0.08			
SREV	LITHIUM	FOUND	0.0446	1		mg/L	++	0.008	0.04			
SREV	LITHIUM	REC	111	1		%	++	0.008	0.04			
SREV	MAGNESIUM	FOUND	0.94	1	B	mg/L	++	0.2	1			
SREV	MAGNESIUM	REC	94	1	B	%	++	0.2	1			
SREV	PHOSPHORUS	FOUND	0.55	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	110	1		%	++	0.1	0.5			
SREV	POTASSIUM	FOUND	1.05	1		mg/L	++	0.2	1			
SREV	POTASSIUM	REC	105	1		%	++	0.2	1			
SREV	SODIUM	FOUND	1.07	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	107	1		%	++	0.2	1			
SREV	STRONTIUM	FOUND	0.0494	1	B	mg/L	++	0.009	0.05			
SREV	STRONTIUM	REC	109	1	B	%	++	0.009	0.05			
SREV	TIN	FOUND	0.217	1		mg/L	++	0.04	0.2			
SREV	TIN	REC	108	1		%	++	0.04	0.2			
SREV	TITANIUM	FOUND	0.026	1	B	mg/L	++	0.005	0.03			
SREV	TITANIUM	REC	104	1	B	%	++	0.005	0.03			
SREV	YTTRIUM	REC	99.4	1		%	++	0.001	0.005			

WG488736ICSAB

Tag:

Measured: 12/23/2019 8:27:59 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND	247.8	1		mg/L	++	0.05	0.3			
SREV	ALUMINUM	REC	99	1		%	++	0.05	0.3			
SREV	BARIUM	FOUND	0.2475	1		mg/L	++	0.007	0.04			
SREV	BARIUM	REC	99	1		%	++	0.007	0.04			
SREV	BORON	FOUND	0.509	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	102	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	248.6	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	99	1		%	++	0.1	0.5			
FAIL	IRON	FOUND	96.16	1		mg/L	++	0.03	0.08			
SREV	IRON	FOUND	94.5	1		mg/L	++	0.03	0.08			
FAIL	IRON	REC	96	1		%	++	0.03	0.08			
SREV	IRON	REC	94	1		%	++	0.03	0.08			
SREV	LITHIUM	FOUND	0.4981	1		mg/L	++	0.008	0.04			
SREV	LITHIUM	REC	99	1		%	++	0.008	0.04			
SREV	MAGNESIUM	FOUND	253.6	1		mg/L	++	0.2	1			
SREV	MAGNESIUM	REC	101	1		%	++	0.2	1			
SREV	PHOSPHORUS	FOUND	4.93	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	98	1		%	++	0.1	0.5			
SREV	POTASSIUM	FOUND	25.29	1		mg/L	++	0.2	1			
SREV	POTASSIUM	REC	101	1		%	++	0.2	1			
SREV	SODIUM	FOUND	25.28	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	101	1		%	++	0.2	1			
SREV	STRONTIUM	FOUND	0.4885	1		mg/L	++	0.009	0.05			
SREV	STRONTIUM	REC	97	1		%	++	0.009	0.05			
SREV	TIN	FOUND	2.473	1		mg/L	++	0.04	0.2			
SREV	TIN	REC	99	1		%	++	0.04	0.2			
SREV	TITANIUM	FOUND	0.508	1		mg/L	++	0.005	0.03			
SREV	TITANIUM	REC	102	1		%	++	0.005	0.03			
SREV	YTTRIUM	REC	97.94	1		%	++	0.001	0.005			

WG488736ULRV

Tag:

Measured: 12/23/2019 8:35:45 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND	257	1		mg/L	++	0.05	0.3			
SREV	ALUMINUM	REC	103	1		%	++	0.05	0.3			
SREV	BARIUM	FOUND	24.41	1		mg/L	++	0.007	0.04			
SREV	BARIUM	REC	98	1		%	++	0.007	0.04			
SREV	BORON	FOUND	25.17	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	101	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	497.1	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	99	1		%	++	0.1	0.5			
FAIL	IRON	FOUND	480.1	1		mg/L	++	0.03	0.08			
SREV	IRON	FOUND	480.8 ✓	1		mg/L	++	0.03	0.08			
SREV	IRON	REC	96	1		%	++	0.03	0.08			
FAIL	IRON	REC	96	1		%	++	0.03	0.08			
SREV	LITHIUM	FOUND		1	U	mg/L	++	0.008	0.04			
SREV	MAGNESIUM	FOUND	257	1		mg/L	++	0.2	1			
SREV	MAGNESIUM	REC	103	1		%	++	0.2	1			
SREV	PHOSPHORUS	FOUND	101.8	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	101	1		%	++	0.1	0.5			
SREV	POTASSIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	SODIUM	FOUND	512.7	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	103	1		%	++	0.2	1			
SREV	STRONTIUM	FOUND	9.727 ✓	1		mg/L	++	0.009	0.05			
SREV	STRONTIUM	REC	97	1		%	++	0.009	0.05			
SREV	TIN	FOUND		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	FOUND	25.13	1		mg/L	++	0.005	0.03			
SREV	TITANIUM	REC	101	1		%	++	0.005	0.03			
SREV	YTTRIUM	REC	95.94	1		%	++	0.001	0.005			

WG488184PBS

Tag:

Measured: 12/23/2019 8:44:03 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND		1	U	mg/L	++	0.05	0.3			
SREV	BARIUM	FOUND		1	U	mg/L	++	0.007	0.04			
FAIL	BORON	FOUND	0.258	1		mg/L	ALRT	0.02	0.1	5x = 1.29		
SREV	CALCIUM	FOUND	0.62 ✓	1		mg/L	ALRT	0.1	0.5	5x = 3.1	BA	
FAIL	IRON	FOUND		1	U	mg/L	++	0.03	0.08			
SREV	IRON	FOUND		1	U	mg/L	++	0.03	0.08			
SREV	LITHIUM	FOUND		1	U	mg/L	++	0.008	0.04			
SREV	MAGNESIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	SODIUM	FOUND	1.64 ✓	1		mg/L	ALRT	0.2	1	5x = 8.2	BA	
SREV	STRONTIUM	FOUND		1	U	mg/L	++	0.009	0.05			
SREV	TIN	FOUND		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	FOUND		1	U	mg/L	++	0.005	0.03			
SREV	YTTRIUM	REC	101.15	1		%	++	0.001	0.005			

WG488184LFB1

Tag:

Measured: 12/23/2019 8:47:59 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND	1.013	1		mg/L	++	0.05	0.3			
SREV	ALUMINUM	REC	101	1		%	++	0.05	0.3			
SREV	BARIUM	FOUND	0.496	1		mg/L	++	0.007	0.04			
SREV	BARIUM	REC	99	1		%	++	0.007	0.04			
FAIL	BORON	FOUND	0.758	1		mg/L	++	0.02	0.1	B is not analyzed for in this sequence		
FAIL	BORON	REC	151	1		%	ALRT	0.02	0.1			
SREV	CALCIUM	FOUND	70.46	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	104	1		%	++	0.1	0.5			
SREV	IRON	FOUND	1.014	1		mg/L	++	0.03	0.08			
FAIL	IRON	FOUND	1.022	1		mg/L	++	0.03	0.08			
SREV	IRON	REC	101	1		%	++	0.03	0.08			
FAIL	IRON	REC	102	1		%	++	0.03	0.08			
SREV	LITHIUM	FOUND	0.9929	1		mg/L	++	0.008	0.04			
SREV	LITHIUM	REC	99	1		%	++	0.008	0.04			
SREV	MAGNESIUM	FOUND	50.23	1		mg/L	++	0.2	1			
SREV	MAGNESIUM	REC	100	1		%	++	0.2	1			
SREV	PHOSPHORUS	FOUND	1.09	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	109	1		%	++	0.1	0.5			
SREV	POTASSIUM	FOUND	100.8	1		mg/L	++	0.2	1			
SREV	POTASSIUM	REC	101	1		%	++	0.2	1			
SREV	SODIUM	FOUND	101.6	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	102	1		%	++	0.2	1			
SREV	STRONTIUM	FOUND	0.5143	1		mg/L	++	0.009	0.05			
SREV	STRONTIUM	REC	103	1		%	++	0.009	0.05			
SREV	TIN	FOUND	1.059	1		mg/L	++	0.04	0.2			
SREV	TIN	REC	106	1		%	++	0.04	0.2			
SREV	TITANIUM	FOUND	1.038	1		mg/L	++	0.005	0.03			
SREV	TITANIUM	REC	104	1		%	++	0.005	0.03			
SREV	YTTRIUM	REC	99.66	1		%	++	0.001	0.005			

L56331-01

Tag:

Measured: 12/23/2019 8:51:49 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	AL-MWMT	27.8	1		mg/L	++	0.05	0.3		M3	
SREV	BARIUM	BA-MWMT	.024	1	B	mg/L	++	0.007	0.04			
REDO	BORON	REG	.18	1		mg/L	++	0.02	0.1			
SREV	CALCIUM	CA-MWMT	485	1		mg/L	++	0.1	0.5		BA	
SREV	IRON	FE-MWMT	5.00	1		mg/L	++	0.03	0.08			
FAIL	IRON	FE-MWMT	5.04	1		mg/L	++	0.03	0.08			
SREV	LITHIUM	LI-MWMT	.094	1		mg/L	++	0.008	0.04		ZG	
SREV	MAGNESIUM	MG-MWMT	199	1		mg/L	++	0.2	1			
REDO	PHOSPHORUS	REG		1	LU	mg/L	LOW	0.1	0.5			
SREV	POTASSIUM	K-MWMT	17.7	1		mg/L	++	0.2	1			
SREV	SODIUM	NA-MWMT	48.7	1		mg/L	++	0.2	1		BA	
SREV	STRONTIUM	SR-MWMT	1.08	1		mg/L	++	0.009	0.05			
SREV	TIN	SN-MWMT		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	TI-MWMT	.031	1		mg/L	++	0.005	0.03		ZG	
NEED	YTTRIUM	REC	102	1		%	++	0.001	0.005			

L56331-02

Tag: Measured: 12/23/2019 8:55:46 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	AL-MWMT	5.67	1		mg/L	++	0.05	0.3		M3	
SREV	BARIUM	BA-MWMT	.017	1	B	mg/L	++	0.007	0.04			
REDO	BORON	REG	.20	1		mg/L	++	0.02	0.1			
REDO	CALCIUM	REG	521	1	O	mg/L	OCAL	0.1	0.5			
SREV	IRON	FE-MWMT		1	U	mg/L	++	0.03	0.08			
FAIL	IRON	FE-MWMT		1	U	mg/L	++	0.03	0.08			
SREV	LITHIUM	LI-MWMT	.082	1		mg/L	++	0.008	0.04		ZG	
SREV	MAGNESIUM	MG-MWMT	139	1		mg/L	++	0.2	1			
SREV	PHOSPHORUS	P-MWMT		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	K-MWMT	44.7	1		mg/L	++	0.2	1			
SREV	SODIUM	NA-MWMT	81.8	1		mg/L	++	0.2	1		BA	
SREV	STRONTIUM	SR-MWMT	3.27	1		mg/L	++	0.009	0.05			
SREV	TIN	SN-MWMT		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	TI-MWMT	.021	1	B	mg/L	++	0.005	0.03		ZG	
NEED	YTTRIUM	REC	98.3	1		%	++	0.001	0.005			

L56331-03

Tag: Measured: 12/23/2019 8:59:38 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	AL-MWMT	4.32	1		mg/L	++	0.05	0.3		M3	
SREV	BARIUM	BA-MWMT	.018	1	B	mg/L	++	0.007	0.04			
REDO	BORON	REG	.15	1		mg/L	++	0.02	0.1			
REDO	CALCIUM	REG	549	1	O	mg/L	OCAL	0.1	0.5			
FAIL	IRON	FE-MWMT	.06	1	B	mg/L	++	0.03	0.08			
SREV	IRON	FE-MWMT	.06	1	B	mg/L	++	0.03	0.08			
SREV	LITHIUM	LI-MWMT	.038	1	B	mg/L	++	0.008	0.04		ZG	
SREV	MAGNESIUM	MG-MWMT	78.3	1		mg/L	++	0.2	1			
SREV	PHOSPHORUS	P-MWMT		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	K-MWMT	21.1	1		mg/L	++	0.2	1			
REDO	SODIUM	REG	14.1	1		mg/L	++	0.2	1			
SREV	STRONTIUM	SR-MWMT	1.85	1		mg/L	++	0.009	0.05			
SREV	TIN	SN-MWMT		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	TI-MWMT	.021	1	B	mg/L	++	0.005	0.03		ZG	
NEED	YTTRIUM	REC	97.7	1		%	++	0.001	0.005			

L56331-04

Tag: Measured: 12/23/2019 9:03:31 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	AL-MWMT	16.4	1		mg/L	++	0.05	0.3		M3	
SREV	BARIUM	BA-MWMT	.019	1	B	mg/L	++	0.007	0.04			
REDO	BORON	REG	.24	1		mg/L	++	0.02	0.1			
REDO	CALCIUM	REG	517	1	O	mg/L	OCAL	0.1	0.5			
SREV	IRON	FE-MWMT		1	U	mg/L	++	0.03	0.08			
FAIL	IRON	FE-MWMT		1	U	mg/L	++	0.03	0.08			
SREV	LITHIUM	LI-MWMT	.166	1		mg/L	++	0.008	0.04		ZG	
SREV	MAGNESIUM	MG-MWMT	185	1		mg/L	++	0.2	1			
SREV	PHOSPHORUS	P-MWMT		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	K-MWMT	63.4	1		mg/L	++	0.2	1			
SREV	SODIUM	NA-MWMT	116	1		mg/L	++	0.2	1		BA	
SREV	STRONTIUM	SR-MWMT	4.01	1		mg/L	++	0.009	0.05			
SREV	TIN	SN-MWMT		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	TI-MWMT	.021	1	B	mg/L	++	0.005	0.03		ZG	
NEED	YTTRIUM	REC	98.2	1		%	++	0.001	0.005			

L56331-05

Tag:

Measured: 12/23/2019 9:07:23 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	AL-MWMT	27.5	1		mg/L	++	0.05	0.3		M3	
SREV	BARIUM	BA-MWMT	.015	1	B	mg/L	++	0.007	0.04			
REDO	BORON	REG	.13	1		mg/L	++	0.02	0.1			
SREV	CALCIUM	CA-MWMT	497	1		mg/L	++	0.1	0.5		BA	
FAIL	IRON	FE-MWMT	.17	1		mg/L	++	0.03	0.08			
SREV	IRON	FE-MWMT	.17	1		mg/L	++	0.03	0.08			
SREV	LITHIUM	LI-MWMT	.219	1		mg/L	++	0.008	0.04		ZG	
SREV	MAGNESIUM	MG-MWMT	97.3	1		mg/L	++	0.2	1			
SREV	PHOSPHORUS	P-MWMT		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	K-MWMT	6.9	1		mg/L	++	0.2	1			
REDO	SODIUM	REG	24.7	1		mg/L	++	0.2	1			
SREV	STRONTIUM	SR-MWMT	.965	1		mg/L	++	0.009	0.05			
SREV	TIN	SN-MWMT		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	TI-MWMT	.024	1	B	mg/L	++	0.005	0.03		ZG	
NEED	YTTRIUM	REC	103	1		%	++	0.001	0.005			

L56331-05MS2

Tag:

Measured: 12/23/2019 9:11:15 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND	28.49	1		mg/L	++	0.05	0.3			
SREV	ALUMINUM	REC	99	1		%	++	0.05	0.3			
SREV	BARIUM	FOUND	0.4796	1		mg/L	++	0.007	0.04			
SREV	BARIUM	REC	93	1		%	++	0.007	0.04			
SREV	BORON	FOUND	0.611	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	96	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	568.2	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	105	1		%	++	0.1	0.5			
SREV	IRON	FOUND	1.104	1		mg/L	++	0.03	0.08			
FAIL	IRON	FOUND	1.115	1		mg/L	++	0.03	0.08			
FAIL	IRON	REC	94	1		%	++	0.03	0.08			
SREV	IRON	REC	93	1		%	++	0.03	0.08			
SREV	LITHIUM	FOUND	1.185	1		mg/L	++	0.008	0.04			
SREV	LITHIUM	REC	96	1		%	++	0.008	0.04			
SREV	MAGNESIUM	FOUND	146.8	1		mg/L	++	0.2	1			
SREV	MAGNESIUM	REC	99	1		%	++	0.2	1			
SREV	PHOSPHORUS	FOUND	0.82	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	82	1		%	++	0.1	0.5			
SREV	POTASSIUM	FOUND	104.6	1		mg/L	++	0.2	1			
SREV	POTASSIUM	REC	98	1		%	++	0.2	1			
SREV	SODIUM	FOUND	122.7	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	98	1		%	++	0.2	1			
SREV	STRONTIUM	FOUND	1.446	1		mg/L	++	0.009	0.05			
SREV	STRONTIUM	REC	96	1		%	++	0.009	0.05			
SREV	TIN	FOUND	0.944	1		mg/L	++	0.04	0.2			
SREV	TIN	REC	94	1		%	++	0.04	0.2			
SREV	TITANIUM	FOUND	0.9742	1		mg/L	++	0.005	0.03			
SREV	TITANIUM	REC	95	1		%	++	0.005	0.03			
SREV	YTTRIUM	REC	103.97	1		%	++	0.001	0.005			

L56331-05MSD2

Tag:

Measured: 12/23/2019 9:15:03 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND	29.06	1		mg/L	++	0.05	0.3			
SREV	ALUMINUM	REC	156	4x 1		%	ALRT	0.05	0.3		M3	
SREV	ALUMINUM	RPD	2	1		%	++	0.05	0.3			
SREV	BARIUM	FOUND	0.4839	1		mg/L	++	0.007	0.04			
SREV	BARIUM	REC	94	1		%	++	0.007	0.04			
SREV	BARIUM	RPD	1	1		%	++	0.007	0.04			
SREV	BORON	FOUND	0.619	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	98	1		%	++	0.02	0.1			
SREV	BORON	RPD	1	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	574.7	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	114	1		%	++	0.1	0.5			
SREV	CALCIUM	RPD	1	1		%	++	0.1	0.5			
FAIL	IRON	FOUND	1.125	1		mg/L	++	0.03	0.08			
SREV	IRON	FOUND	1.112	1		mg/L	++	0.03	0.08			
FAIL	IRON	REC	95	1		%	++	0.03	0.08			
SREV	IRON	REC	94	1		%	++	0.03	0.08			
FAIL	IRON	RPD	1	1		%	++	0.03	0.08			
SREV	IRON	RPD	1	1		%	++	0.03	0.08			
SREV	LITHIUM	FOUND	1.198	1		mg/L	++	0.008	0.04			
SREV	LITHIUM	REC	98	1		%	++	0.008	0.04			
SREV	LITHIUM	RPD	1	1		%	++	0.008	0.04			
SREV	MAGNESIUM	FOUND	148.5	1		mg/L	++	0.2	1			
SREV	MAGNESIUM	REC	102	1		%	++	0.2	1			
SREV	MAGNESIUM	RPD	1	1		%	++	0.2	1			
SREV	PHOSPHORUS	FOUND	0.81	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	81	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	RPD	1	1		%	++	0.1	0.5			
SREV	POTASSIUM	FOUND	105.8	1		mg/L	++	0.2	1			
SREV	POTASSIUM	REC	99	1		%	++	0.2	1			
SREV	POTASSIUM	RPD	1	1		%	++	0.2	1			
SREV	SODIUM	FOUND	124	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	99	1		%	++	0.2	1			
SREV	SODIUM	RPD	1	1		%	++	0.2	1			
SREV	STRONTIUM	FOUND	1.468	1		mg/L	++	0.009	0.05			
SREV	STRONTIUM	REC	100	1		%	++	0.009	0.05			
SREV	STRONTIUM	RPD	2	1		%	++	0.009	0.05			
SREV	TIN	FOUND	0.938	1		mg/L	++	0.04	0.2			
SREV	TIN	REC	94	1		%	++	0.04	0.2			
SREV	TIN	RPD	1	1		%	++	0.04	0.2			
SREV	TITANIUM	FOUND	0.9773	1		mg/L	++	0.005	0.03			
SREV	TITANIUM	REC	95	1		%	++	0.005	0.03			
SREV	TITANIUM	RPD	0	1		%	++	0.005	0.03			
SREV	YTTRIUM	REC	102.35	1		%	++	0.001	0.005			

L56331-06

Tag: Measured: 12/23/2019 9:18:51 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	AL-MWMT		1	U	mg/L	++	0.05	0.3		M3	
SREV	BARIUM	BA-MWMT	.017	1	B	mg/L	++	0.007	0.04			
REDO	BORON	REG	.17	1		mg/L	++	0.02	0.1			
SREV	CALCIUM	CA-MWMT	216	1		mg/L	++	0.1	0.5		BA	
SREV	IRON	FE-MWMT		1	U	mg/L	++	0.03	0.08			
FAIL	IRON	FE-MWMT		1	U	mg/L	++	0.03	0.08			
SREV	LITHIUM	LI-MWMT	.031	1	B	mg/L	++	0.008	0.04		ZG	
SREV	MAGNESIUM	MG-MWMT	18.5	1		mg/L	++	0.2	1			
SREV	PHOSPHORUS	P-MWMT		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	K-MWMT	31.6	1		mg/L	++	0.2	1			
SREV	SODIUM	NA-MWMT	62.0	1		mg/L	++	0.2	1		BA	
SREV	STRONTIUM	SR-MWMT	1.71	1		mg/L	++	0.009	0.05			
SREV	TIN	SN-MWMT		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	TI-MWMT	.018	1	B	mg/L	++	0.005	0.03		ZG	
NEED	YTTRIUM	REC	98.5	1		%	++	0.001	0.005			

WG488736CCV1

Tag: Measured: 12/23/2019 9:22:43 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND	0.984	1		mg/L	++	0.05	0.3			
SREV	ALUMINUM	REC	98	1		%	++	0.05	0.3			
SREV	BARIUM	FOUND	0.9801	1		mg/L	++	0.007	0.04			
SREV	BARIUM	REC	98	1		%	++	0.007	0.04			
SREV	BORON	FOUND	0.983	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	98	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	48.14	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	96	1		%	++	0.1	0.5			
FAIL	IRON	FOUND	0.959	1		mg/L	++	0.03	0.08			
SREV	IRON	FOUND	0.952	1		mg/L	++	0.03	0.08			
FAIL	IRON	REC	96	1		%	++	0.03	0.08			
SREV	IRON	REC	95	1		%	++	0.03	0.08			
SREV	LITHIUM	FOUND	0.9691	1		mg/L	++	0.008	0.04			
SREV	LITHIUM	REC	97	1		%	++	0.008	0.04			
SREV	MAGNESIUM	FOUND	47.73	1		mg/L	++	0.2	1			
SREV	MAGNESIUM	REC	95	1		%	++	0.2	1			
SREV	PHOSPHORUS	FOUND	2.52	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	101	1		%	++	0.1	0.5			
SREV	POTASSIUM	FOUND	9.75	1		mg/L	++	0.2	1			
SREV	POTASSIUM	REC	98	1		%	++	0.2	1			
SREV	SODIUM	FOUND	48.47	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	97	1		%	++	0.2	1			
SREV	STRONTIUM	FOUND	0.9729	1		mg/L	++	0.009	0.05			
SREV	STRONTIUM	REC	97	1		%	++	0.009	0.05			
SREV	TIN	FOUND	1.013	1		mg/L	++	0.04	0.2			
SREV	TIN	REC	101	1		%	++	0.04	0.2			
SREV	TITANIUM	FOUND	0.9959	1		mg/L	++	0.005	0.03			
SREV	TITANIUM	REC	100	1		%	++	0.005	0.03			
SREV	YTTRIUM	REC	97.93	1		%	++	0.001	0.005			

WG488736CCB1

Tag:

Measured: 12/23/2019 9:26:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND		1	U	mg/L	++	0.05	0.3			
SREV	BARIUM	FOUND		1	U	mg/L	++	0.007	0.04			
SREV	BORON	FOUND		1	U	mg/L	++	0.02	0.1			
SREV	CALCIUM	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	IRON	FOUND		1	U	mg/L	++	0.03	0.08			
FAIL	IRON	FOUND		1	U	mg/L	++	0.03	0.08			
SREV	LITHIUM	FOUND		1	U	mg/L	++	0.008	0.04			
SREV	MAGNESIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	SODIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	STRONTIUM	FOUND		1	U	mg/L	++	0.009	0.05			
SREV	TIN	FOUND		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	FOUND		1	U	mg/L	++	0.005	0.03			
SREV	YTTRIUM	REC	98.11	1		%	++	0.001	0.005			

L56331-07

Tag:

Measured: 12/23/2019 9:30:26 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	AL-MWMT	22.5	1		mg/L	++	0.05	0.3		M3	
SREV	BARIUM	BA-MWMT	.017	1	B	mg/L	++	0.007	0.04			
REDO	BORON	REG	.14	1		mg/L	++	0.02	0.1			
REDO	CALCIUM	REG	530	1	O	mg/L	OCAL	0.1	0.5			
FAIL	IRON	FE-MWMT	.12	1		mg/L	++	0.03	0.08			
SREV	IRON	FE-MWMT	.12	1		mg/L	++	0.03	0.08			
SREV	LITHIUM	LI-MWMT	.303	1		mg/L	++	0.008	0.04		ZG	
SREV	MAGNESIUM	MG-MWMT	101	1		mg/L	++	0.2	1			
SREV	PHOSPHORUS	P-MWMT		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	K-MWMT	7.9	1		mg/L	++	0.2	1			
REDO	SODIUM	REG	26.2	1		mg/L	++	0.2	1			
SREV	STRONTIUM	SR-MWMT	1.14	1		mg/L	++	0.009	0.05			
SREV	TIN	SN-MWMT		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	TI-MWMT	.022	1	B	mg/L	++	0.005	0.03		ZG	
NEED	YTTRIUM	REC	102	1		%	++	0.001	0.005			

L56331-08

Tag:

Measured: 12/23/2019 9:34:17 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	AL-MWMT	19.8	1		mg/L	++	0.05	0.3		M3	
SREV	BARIUM	BA-MWMT	.036	1	B	mg/L	++	0.007	0.04			
REDO	BORON	REG	.13	1		mg/L	++	0.02	0.1			
REDO	CALCIUM	REG	509	1	O	mg/L	OCAL	0.1	0.5			
FAIL	IRON	FE-MWMT	.60	1		mg/L	++	0.03	0.08			
SREV	IRON	FE-MWMT	.59	1		mg/L	++	0.03	0.08			
SREV	LITHIUM	LI-MWMT	.113	1		mg/L	++	0.008	0.04		ZG	
SREV	MAGNESIUM	MG-MWMT	114	1		mg/L	++	0.2	1			
SREV	PHOSPHORUS	P-MWMT		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	K-MWMT	24.5	1		mg/L	++	0.2	1			
REDO	SODIUM	REG	22.4	1		mg/L	++	0.2	1			
SREV	STRONTIUM	SR-MWMT	2.73	1		mg/L	++	0.009	0.05			
SREV	TIN	SN-MWMT		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	TI-MWMT	.024	1	B	mg/L	++	0.005	0.03		ZG	
NEED	YTTRIUM	REC	100	1		%	++	0.001	0.005			

L56331-09 **Tag:** **Measured: 12/23/2019 9:38:08 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	AL-MWMT	48.1	1		mg/L	++	0.05	0.3		M3	
SREV	BARIUM	BA-MWMT	.009	1	B	mg/L	++	0.007	0.04			
REDO	BORON	REG	.16	1		mg/L	++	0.02	0.1			
SREV	CALCIUM	CA-MWMT	471	1		mg/L	++	0.1	0.5		BA	
SREV	IRON	FE-MWMT	3.32	1		mg/L	++	0.03	0.08			
FAIL	IRON	FE-MWMT	3.34	1		mg/L	++	0.03	0.08			
SREV	LITHIUM	LI-MWMT	.091	1		mg/L	++	0.008	0.04		ZG	
SREV	MAGNESIUM	MG-MWMT	183	1		mg/L	++	0.2	1			
REDO	PHOSPHORUS	REG		1	LU	mg/L	LOW	0.1	0.5			
SREV	POTASSIUM	K-MWMT	17.1	1		mg/L	++	0.2	1			
SREV	SODIUM	NA-MWMT	36.1	1		mg/L	++	0.2	1		BA	
SREV	STRONTIUM	SR-MWMT	1.19	1		mg/L	++	0.009	0.05			
SREV	TIN	SN-MWMT		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	TI-MWMT	.033	1		mg/L	++	0.005	0.03		ZG	
NEED	YTTRIUM	REC	104	1		%	++	0.001	0.005			

L56331-09SDL **Tag:** **Measured: 12/23/2019 9:42:04 PM**

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	D	5	1		%	++	0.05	0.3			
SREV	ALUMINUM	FOUND	10.11	1		mg/L	++	0.05	0.3			
SREV	ALUMINUM	REG	50.55	1		mg/L	++	0.05	0.3			
SREV	BARIUM	D		1	U	%	++	0.007	0.04			
SREV	BARIUM	FOUND		1	U	mg/L	++	0.007	0.04			
SREV	BARIUM	REG	0	1	U	mg/L	++	0.007	0.04			
FAIL	BORON	D	34	1	B	%	ALRT	0.02	0.1	Boron is not analyzed in this sequences		
FAIL	BORON	FOUND	0.043	1	B	mg/L	++	0.02	0.1			
FAIL	BORON	REG	0.215	1	B	mg/L	++	0.02	0.1			
SREV	CALCIUM	D	5	1		%	++	0.1	0.5			
SREV	CALCIUM	FOUND	98.68	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REG	493.4	1		mg/L	++	0.1	0.5			
SREV	IRON	D	6	1		%	++	0.03	0.08			
FAIL	IRON	D	7	1		%	++	0.03	0.08			
SREV	IRON	FOUND	0.704	1		mg/L	++	0.03	0.08			
FAIL	IRON	FOUND	0.713	1		mg/L	++	0.03	0.08			
FAIL	IRON	REG	3.565	1		mg/L	++	0.03	0.08			
SREV	IRON	REG	3.52	1		mg/L	++	0.03	0.08			
SREV	LITHIUM	D	19	1	B	%	ALRT	0.008	0.04		ZG	The initial sample concentration is less than 50x MDL
SREV	LITHIUM	FOUND	0.0216	1	B	mg/L	++	0.008	0.04			
SREV	LITHIUM	REG	0.108	1	B	mg/L	++	0.008	0.04			
SREV	MAGNESIUM	D	3	1		%	++	0.2	1			
SREV	MAGNESIUM	FOUND	37.68	1		mg/L	++	0.2	1			
SREV	MAGNESIUM	REG	188.4	1		mg/L	++	0.2	1			
SREV	PHOSPHORUS	D		1	U	%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REG	0	1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	D	4	1		%	++	0.2	1			
SREV	POTASSIUM	FOUND	3.57	1		mg/L	++	0.2	1			
SREV	POTASSIUM	REG	17.85	1		mg/L	++	0.2	1			
SREV	SODIUM	D	1	1		%	++	0.2	1			
SREV	SODIUM	FOUND	7.3	1		mg/L	++	0.2	1			
SREV	SODIUM	REG	36.5	1		mg/L	++	0.2	1			
SREV	STRONTIUM	D	6	1		%	++	0.009	0.05			
SREV	STRONTIUM	FOUND	0.2534	1		mg/L	++	0.009	0.05			
SREV	STRONTIUM	REG	1.267	1		mg/L	++	0.009	0.05			
SREV	TIN	D		1	U	%	++	0.04	0.2			
SREV	TIN	FOUND		1	U	mg/L	++	0.04	0.2			
SREV	TIN	REG	0	1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	D	102	1	B	%	ALRT	0.005	0.03		ZG	The initial sample concentration is less than 50x MDL
SREV	TITANIUM	FOUND	0.0133	1	B	mg/L	++	0.005	0.03			
SREV	TITANIUM	REG	0.0665	1	B	mg/L	++	0.005	0.03			
SREV	YTTRIUM	REC	98.93	1		%	++	0.001	0.005			

WG488736CCV2

Tag:

Measured: 12/23/2019 9:45:54 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND	0.988	1		mg/L	++	0.05	0.3			
SREV	ALUMINUM	REC	99	1		%	++	0.05	0.3			
SREV	BARIUM	FOUND	0.9797	1		mg/L	++	0.007	0.04			
SREV	BARIUM	REC	98	1		%	++	0.007	0.04			
SREV	BORON	FOUND	0.992	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	99	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	47.92	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	96	1		%	++	0.1	0.5			
FAIL	IRON	FOUND	0.964	1		mg/L	++	0.03	0.08			
SREV	IRON	FOUND	0.941	1		mg/L	++	0.03	0.08			
SREV	IRON	REC	94	1		%	++	0.03	0.08			
FAIL	IRON	REC	96	1		%	++	0.03	0.08			
SREV	LITHIUM	FOUND	0.974	1		mg/L	++	0.008	0.04			
SREV	LITHIUM	REC	97	1		%	++	0.008	0.04			
SREV	MAGNESIUM	FOUND	47.52	1		mg/L	++	0.2	1			
SREV	MAGNESIUM	REC	95	1		%	++	0.2	1			
SREV	PHOSPHORUS	FOUND	2.55	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	102	1		%	++	0.1	0.5			
SREV	POTASSIUM	FOUND	9.74	1		mg/L	++	0.2	1			
SREV	POTASSIUM	REC	97	1		%	++	0.2	1			
SREV	SODIUM	FOUND	48.37	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	97	1		%	++	0.2	1			
SREV	STRONTIUM	FOUND	0.9742	1		mg/L	++	0.009	0.05			
SREV	STRONTIUM	REC	97	1		%	++	0.009	0.05			
SREV	TIN	FOUND	1.008	1		mg/L	++	0.04	0.2			
SREV	TIN	REC	101	1		%	++	0.04	0.2			
SREV	TITANIUM	FOUND	0.9917	1		mg/L	++	0.005	0.03			
SREV	TITANIUM	REC	99	1		%	++	0.005	0.03			
SREV	YTTRIUM	REC	97.74	1		%	++	0.001	0.005			

WG488736CCB2

Tag:

Measured: 12/23/2019 9:49:41 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALUMINUM	FOUND		1	U	mg/L	++	0.05	0.3			
SREV	BARIUM	FOUND		1	U	mg/L	++	0.007	0.04			
SREV	BORON	FOUND		1	U	mg/L	++	0.02	0.1			
SREV	CALCIUM	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	IRON	FOUND		1	U	mg/L	++	0.03	0.08			
FAIL	IRON	FOUND		1	U	mg/L	++	0.03	0.08			
SREV	LITHIUM	FOUND		1	U	mg/L	++	0.008	0.04			
SREV	MAGNESIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	POTASSIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	SODIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	STRONTIUM	FOUND		1	U	mg/L	++	0.009	0.05			
SREV	TIN	FOUND		1	U	mg/L	++	0.04	0.2			
SREV	TITANIUM	FOUND		1	U	mg/L	++	0.005	0.03			
SREV	YTTRIUM	REC	98.5	1		%	++	0.001	0.005			

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)
Ag 328.068 {103}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000173	0.043407	0.000000	1.000000
Al 396.152 { 85}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000446	0.031919	0.000000	1.000000
As 189.042 {478}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000019	0.001294	0.000000	1.000000
B 208.959 {461}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000074	0.007397	0.000000	1.000000
Ba 455.403 { 74}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.004542	2.855776	0.000000	1.000000
Be 313.042 {108}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.005831	1.930700	0.000000	1.000000
Bi 223.061 {451}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000065	0.001809	0.000000	1.000000
Ca 315.887 {107}	12/23/2019 20:16:20	12/23/2019 20:16:20	Linear	None	-0.005943	0.016695	0.000000	1.000000
Cd 214.438 {457}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000116	0.048064	0.000000	1.000000
Cd 226.502 {449}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000034	0.039528	0.000000	1.000000
Co 228.616 {447}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000008	0.012604	0.000000	1.000000
Cr 205.560 {464}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000027	0.015192	0.000000	1.000000
Cr 267.716 {126}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000312	0.021468	0.000000	1.000000
Cu 324.754 {104}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000896	0.060079	0.000000	1.000000
Fe 240.488 {140}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000035	0.012394	0.000000	1.000000
Fe 259.940 {130}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000051	0.028062	0.000000	1.000000
Ga 294.364 {114}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000524	0.002846	0.000000	1.000000
K 766.490 { 44}	12/23/2019 20:16:20	12/23/2019 20:16:20	Linear	None	0.002575	0.017891	0.000000	1.000000
Li 670.784 { 50}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.004924	0.486197	0.000000	1.000000
Mg 279.079 {121}	12/23/2019 20:16:20	12/23/2019 20:16:20	Linear	None	0.000273	0.002878	0.000000	1.000000
Mn 257.610 {131}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000675	0.201458	0.000000	1.000000
Mo 202.030 {467}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000019	0.009631	0.000000	1.000000
Na 589.592 { 57}	12/23/2019 20:16:20	12/23/2019 20:16:20	Linear	None	0.004817	0.066259	0.000000	1.000000
Ni 231.604 {446}	12/23/2019 20:16:20	12/23/2019 20:16:20	Linear	None	0.000006	0.009626	0.000000	1.000000
P 214.914 {457}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000086	0.001009	0.000000	1.000000
Pb 220.353 {453}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000080	0.002429	0.000000	1.000000
S 182.034 {485}	12/23/2019 20:16:20	12/23/2019 20:16:20	Linear	None	0.000060	0.001268	0.000000	1.000000
Sb 206.833 {463}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000017	0.001823	0.000000	1.000000
Sc 361.384 { 93}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000550	0.724064	0.000000	1.000000
Se 196.090 {472}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000014	0.001207	0.000000	1.000000
Si 251.611 {134}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000648	0.009848	0.000000	1.000000
Si 251.611 {134}2	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000648	0.009848	0.000000	1.000000
Sn 189.989 {477}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	0.000025	0.002177	0.000000	1.000000
Sr 421.552 { 80}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.005498	2.728876	0.000000	1.000000
Ti 334.941 {101}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000093	0.149840	0.000000	1.000000
Tl 190.856 {477}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000073	0.001592	0.000000	1.000000
V 292.402 {115}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000656	0.031069	0.000000	1.000000
Y 371.030 { 91}*	12/23/2019 20:16:20	12/23/2019 20:16:20	Linear	None	16334.747	-259.15048	0.000000	1.000000
Zn 206.200 {463}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000054	0.013534	0.000000	1.000000
Zn 213.856 {457}	12/23/2019 20:12:27	12/23/2019 20:12:27	Linear	None	-0.000000	0.020787	0.000000	1.000000

Element, Wavelength and Order	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope		QC Norm	
						Slope	Y-int	Slope factor	Offset
Ag 328.068 {103}	1.000000	0.000005	0.005408	0.018027	OK.	1.000000	0.000000	1	0
Al 396.152 { 85}	0.999998	0.000404	0.012265	0.040883	OK.	1.000000	0.000000	1	0
As 189.042 {478}	0.999995	0.000014	0.017046	0.056820	OK.	1.000000	0.000000	1	0
B 208.959 {461}	0.999992	0.000109	0.004237	0.014125	OK.	1.000000	0.000000	1	0
Ba 455.403 { 74}	0.999998	0.008321	0.000248	0.000826	OK.	1.000000	0.000000	1	0
Be 313.042 {108}	0.999998	0.004823	0.000172	0.000573	OK.	1.000000	0.000000	1	0
Bi 223.061 {451}	0.999997	0.000016	0.019545	0.065151	OK.	1.000000	0.000000	1	0
Ca 315.887 {107}	1.000000	0.000311	0.014758	0.049192	OK.	1.000000	0.000000	1	0
Cd 214.438 {457}	1.000000	0.000028	0.000688	0.002293	OK.	1.000000	0.000000	1	0
Cd 226.502 {449}	0.999999	0.000088	0.000951	0.003170	OK.	1.000000	0.000000	1	0
Co 228.616 {447}	1.000000	0.000002	0.002717	0.009058	OK.	1.000000	0.000000	1	0
Cr 205.560 {464}	0.999996	0.000159	0.002389	0.007965	OK.	1.000000	0.000000	1	0
Cr 267.716 {126}	0.999989	0.000355	0.007199	0.023996	OK.	1.000000	0.000000	1	0
Cu 324.754 {104}	0.999995	0.000271	0.005226	0.017420	OK.	1.000000	0.000000	1	0
Fe 240.488 {140}	0.999982	0.000263	0.011729	0.039097	OK.	1.000000	0.000000	1	0
Fe 259.940 {130}	0.999993	0.000358	0.004431	0.014768	OK.	1.000000	0.000000	1	0
Ga 294.364 {114}	0.999995	0.000013	0.053336	0.177786	OK.	1.000000	0.000000	1	0
K 766.490 { 44}	1.000000	0.000238	0.043871	0.146236	OK.	1.000000	0.000000	1	0
Li 670.784 { 50}	0.999992	0.002787	0.001737	0.005791	OK.	1.000000	0.000000	1	0
Mg 279.079 {121}	0.999997	0.000389	0.048371	0.161235	OK.	1.000000	0.000000	1	0
Mn 257.610 {131}	0.999990	0.001271	0.000666	0.002219	OK.	1.000000	0.000000	1	0
Mo 202.030 {467}	0.999998	0.000024	0.002897	0.009656	OK.	1.000000	0.000000	1	0
Na 589.592 { 57}	1.000000	0.001503	0.012733	0.042443	OK.	1.000000	0.000000	1	0
Ni 231.604 {446}	1.000000	0.000000	0.003830	0.012766	OK.	1.000000	0.000000	1	0
P 214.914 {457}	0.999992	0.000015	0.032582	0.108607	OK.	1.000000	0.000000	1	0
Pb 220.353 {453}	0.999999	0.000012	0.014251	0.047504	OK.	1.000000	0.000000	1	0
S 182.034 {485}	0.999990	0.000169	0.021027	0.070091	OK.	1.000000	0.000000	1	0
Sb 206.833 {463}	0.999970	0.000020	0.016214	0.054047	OK.	1.000000	0.000000	1	0
Sc 361.384 { 93}	0.999997	0.002647	0.000455	0.001516	OK.	1.000000	0.000000	1	0
Se 196.090 {472}	0.999995	0.000013	0.021290	0.070965	OK.	1.000000	0.000000	1	0
Si 251.611 {134}	0.999999	0.000051	0.012679	0.042263	OK.	1.000000	0.000000	1	0
Si 251.611 {134}2	0.999999	0.000051	0.012679	0.042263	OK.	1.000000	0.000000	1	0
Sn 189.989 {477}	0.999996	0.000021	0.009707	0.032356	OK.	1.000000	0.000000	1	0
Sr 421.552 { 80}	0.999994	0.013454	0.000195	0.000649	OK.	1.000000	0.000000	1	0
Ti 334.941 {101}	0.999998	0.000194	0.001525	0.005082	OK.	1.000000	0.000000	1	0
Tl 190.856 {477}	1.000000	0.000000	0.019298	0.064326	OK.	1.000000	0.000000	1	0
V 292.402 {115}	1.000000	0.000006	0.005299	0.017663	OK.	1.000000	0.000000	1	0
Y 371.030 { 91}*	0.350893	423.50850	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Zn 206.200 {463}	0.999999	0.000023	0.001936	0.006454	OK.	1.000000	0.000000	1	0
Zn 213.856 {457}	0.999999	0.000039	0.001261	0.004202	OK.	1.000000	0.000000	1	0

CALIBRATION REAGENTS

6010/200.7 Reagent Sheet

1% Calibration Standards			10% Calibration Standards		
CLPSTD1:	**	SCN	CLPTSTD1:	**	SCN
CLPSTD2:	II191210-2	SCN	CLPTSTD2:	II191209-3	SCN
CLPSTD3:	II191209-1	SCN	CLPTSTD3:	II191127-3	SCN

Yttrium (Internal Standard) = PCN59951 EXP: 12/30/2020

**=CALSTD1 is a 2X dilution on CALSTD2 using either 1% or 10% Blank as the dilutent.

Blank Solutions:

Nitric acid:	60422	PCN	Nitric acid:	60422	PCN
Hydrochloric acid:	60374	PCN	Hydrochloric acid:	60375	PCN

VERIFIED BY: JLW 12/26/19

ICPSTD

Wood - E&I Solutions, Inc.

Project ID: L56331

Metals Analysis

WG488736 **ICP MWMT**

Sample	Date	SCN	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Cd	Co	Cr	Cr	Cu	Fe	Fe	Ga	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Se	Si	SiO2	Sn	Sr	Ti	Tl	V
WG488736ICV	12/23/19 20:16	II191209-2		X		X	X			X							X	X		X	X	X			X		X			X					X	X	X		
WG488736ICB	12/23/19 20:20			X		X	X			X							X	X		X	X	X			X		X			X					X	X	X		
WG488736PQV	12/23/19 20:24	II191202-2		X		X	X			X							X	X		X	X	X			X		X								X	X	X		
WG488736ICSAB	12/23/19 20:27	II191127-4		X		X	X			X							X	X		X	X	X			X		X								X	X	X		
WG488736ULRV	12/23/19 20:35	II191113-1		X		X	X			X							X	X		X	X	X			X		X								X	X	X		
WG488184PBS	12/23/19 20:44		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WG488184LFB1	12/23/19 20:47	II191204-3		X		X	X			X							X	X		X	X	X			X		X								X	X	X		
L56331-01	12/23/19 20:51			X			X			X							X	X		X	X	X			X										X	X	X		
L56331-02	12/23/19 20:55			X			X										X	X		X	X	X			X		X								X	X	X		
L56331-03	12/23/19 20:59			X			X										X	X		X	X	X					X								X	X	X		
L56331-04	12/23/19 21:03			X			X										X	X		X	X	X			X		X								X	X	X		
L56331-05	12/23/19 21:07			X			X			X							X	X		X	X	X					X								X	X	X		
L56331-05MS2	12/23/19 21:11	II191204-3		X		X	X			X							X	X		X	X	X			X		X								X	X	X		
L56331-05MSD2	12/23/19 21:15	II191204-3		X		X	X			X							X	X		X	X	X			X		X								X	X	X		
L56331-06	12/23/19 21:18			X			X			X							X	X		X	X	X			X		X								X	X	X		
WG488736CCV1	12/23/19 21:22	II191204-1		X		X	X			X							X	X		X	X	X			X		X								X	X	X		
WG488736CCB1	12/23/19 21:26		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L56331-07	12/23/19 21:30			X			X										X	X		X	X	X					X								X	X	X		
L56331-08	12/23/19 21:34			X			X										X	X		X	X	X					X								X	X	X		
L56331-09	12/23/19 21:38			X			X			X							X	X		X	X	X			X										X	X	X		
L56331-09SDL	12/23/19 21:42			X		X	X			X							X	X		X	X	X			X		X								X	X	X		
WG488736CCV2	12/23/19 21:45	II191204-1		X		X	X			X							X	X		X	X	X			X		X								X	X	X		
WG488736CCB2	12/23/19 21:49		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

L56331-2006231417

ICP MWMT

QC List Type: QC-ICP-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICP-6010
QC Ref: MA-ICP-SOIL-6010
Group ID: MA-G-ICP_-MWMT
Method Ref: M6010B
SOP Ref: SOPII012

WG488806

ACZ Laboratories, Inc

Instrument ID: ICP8
Analyst: JLW
ACZ Dept: 33
Create Date: 12/26/2019 10:23
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	BMWMT	CAMWMT	NAMWMT	PMWMT	Dilution
1	WG488806ICV	II191209-2			1			✓	✓	✓	✓	1
2	WG488806ICB	NONE			1			✓	✓	✓	✓	1
3	WG488806PQV	II191223-3			1			✓	✓	✓	✓	1
4	WG488806ICSAB	II191127-4			1			✓	✓	✓	✓	1
5	WG488806ULRV	II191113-1			1			✓	✓	✓	✓	1
6	WG488184PBS	NONE			1			✓	✓	✓	✓	1
7	L56331-01	STSB32_0.5-3			1			✓			✓	2
8	L56331-02	STSB32_6-15			1			✓	✓			2
9	L56331-03	STSB34_0.5-3			1			✓	✓	✓		2
10	L56331-04	STSB34_6-15			1			✓	✓			2
11	L56331-05	STSB33_0.5-3			1			✓		✓		1
12	L56331-05MS2	II191204-3			1			✓	✓	✓	✓	1
13	WG488806CCV1	II191204-1			1			✓	✓	✓	✓	1
14	WG488806CCB1	NONE			1			✓	✓	✓	✓	1
15	L56331-05MSD2	II191204-3			1			✓	✓	✓	✓	1
16	L56331-06	STSB33_6-15			1			✓				1
17	L56331-06SDL	NONE			1			✓	✓	✓	✓	1
18	L56331-07	STSB33-FD_0.5-3			1			✓	✓	✓		2
19	L56331-08	STSB35_0.5-3			1			✓	✓	✓		2
20	L56331-09	STSB35_6-15			1			✓			✓	2
21	WG488184LFB1	II191204-3			1			✓	✓	✓	✓	1
22	WG488806CCV2	II191204-1			1			✓	✓	✓	✓	1

JLW 12/26/19

- P LOW
CA OCM JLW 12/26/19

CA OCM JLW 12/26/19
- P LOW

Report Comments:

Internal Comments

AREV: JLW 12/26/19
Initials, Date

SREV: 12-27-19
Initials, Date

Page 1 of 2

12/26/2019 10:24:25 AM 10120

ICP MWMT

QC List Type: QC-ICP-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICP-6010
QC Ref: MA-ICP-SOIL-6010
Group ID: MA-G-ICP_-MWMT
Method Ref: M6010B
SOP Ref: SOPII012

WG488806

ACZ Laboratories, Inc

Instrument ID: ICP8
Analyst:
ACZ Dept: 33
Create Date: 12/26/2019 10:23
Start Date/Time:
End Date/Time:

SE Q	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	B MW MT	CA MW MT	NA MW MT	P MW MT	Dilution
23	WG488806CCB2	NONE			1			✔	✔	✔	✔	1

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS2	ICP Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184LFB1	ICP LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/26/2019 10:24:25 AM 10120

ACZ Laboratories, Inc.

ICP DATA REVIEW CHECKLIST

Reviewed By:	JLW
Date:	12/26/19
Approved By:	[illegible]
Date:	12-27-19

Work Group:	488806
Sample Type:	MWMT
Analysis Date:	12/26/19
Analyst:	JLW

Instrument Checklist

	Yes	No	N / A
1) Is the correct run date associated with the workgroup?	✓		
2) Are all of the QC critera listed in LIMS within specified limits? **		✓	
3) Are all samples requiring re-analysis / re-digestion at REDO / REDX status?	✓		
4) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
5) Is a current standard/reagent form attached to the workgroup?	✓		
6) Have all dilutions performed at the bench been checked off on the benchsheet?	✓		
7) Has any sample on a 2x dilution been checked for proper mixing (review raw data)?	✓		
8) Is any sample analyzed on dilution appropriately "D" qualified (not required for o-cal, EC, TDS)?			✓
9) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?	✓		
10) Are any samples that have recoveries outside of limits for the Yttrium Internal Standard set to REDO?			✓
11) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

For any item listed above that is checked "No" state the problem and corrective action / resolution in the sections below.

QC/Sample ID	Analytical Problem	Corrective action
PBS	B ↑	B1
	Ca ↑	Ba
	Na ↑	D1
LFB	B	B1
L56331-09	P Low @ 2x	Redo 5x

FRMII009.06.13.14

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488806

Date Reported: 27-Dec-19
Run ID: R1765759
Date Analyzed: 26-Dec-19
ICAL Workgroup:
Instrument ID: ICP8

WG488806ICV

Tag:

Measured: 12/26/2019 11:49:50 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND	3.982	1		mg/L	++	0.03	0.2			
SREV	ANTIMONY	REC	100	1		%	++	0.03	0.2			
SREV	ANTIMONY	RSD	1.059	1		mg/L	++	0.03	0.15			
SREV	BORON	FOUND	2.026	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	101	1		%	++	0.02	0.1			
SREV	BORON	RSD	1.043	1		mg/L	++	0.02	0.1			
SREV	CALCIUM	FOUND	99.14	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	99	1		%	++	0.1	0.5			
SREV	CALCIUM	RSD	0.0584	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND	5.04	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	101	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	RSD	0.9955	1		mg/L	++	0.1	0.5			
SREV	SODIUM	FOUND	99.67	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	100	1		%	++	0.2	1			
SREV	SODIUM	RSD	0.1638	1		mg/L	++	0.2	1			
SREV	YTTRIUM	REC	95.13	1		%	++	0.001	0.005			

WG488806ICB

Tag:

Measured: 12/26/2019 11:53:33 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.03	0.2			
SREV	BORON	FOUND		1	U	mg/L	++	0.02	0.1			
SREV	CALCIUM	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	SODIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	YTTRIUM	REC	96.22	1		%	++	0.001	0.005			

WG488806PQV

Tag:

Measured: 12/26/2019 11:57:31 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND	0.103	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	103	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	0.45	1	B	mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	90	1	B	%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND	0.49	1	B	mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	98	1	B	%	++	0.1	0.5			
SREV	SODIUM	FOUND	1.05	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	105	1		%	++	0.2	1			
SREV	YTTRIUM	REC	96.32	1		%	++	0.001	0.005			

WG488806ICSAB

Tag: Measured: 12/26/2019 12:01:26 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND	0.498	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	100	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	243.8	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	97	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND	4.89	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	97	1		%	++	0.1	0.5			
SREV	SODIUM	FOUND	25.14	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	101	1		%	++	0.2	1			
SREV	YTTRIUM	REC	97.97	1		%	++	0.001	0.005			

WG488806ULRV

Tag: Measured: 12/26/2019 12:09:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND	24.79	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	99	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	485.6	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	97	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND	98.6	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	98	1		%	++	0.1	0.5			
SREV	SODIUM	FOUND	502	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	101	1		%	++	0.2	1			
SREV	YTTRIUM	REC	96.71	1		%	++	0.001	0.005			

WG488184PBS

Tag: 1 Measured: 12/26/2019 12:17:31 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND	0.243	1		mg/L	ALRT	0.02	0.1	5x = 1.215	B1 All samples qualified for B	
SREV	CALCIUM	FOUND	0.52	1		mg/L	ALRT	0.1	0.5	5x = 2.6	BA All samples above 5x for Ca	
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	SODIUM	FOUND	1.67	1		mg/L	ALRT	0.2	1	5x = 8.35	B1	
SREV	YTTRIUM	REC	97.12	1		%	++	0.001	0.005			

WG488184LFB1

Tag: 1 Measured: 12/26/2019 12:21:25 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND	0.743	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	148	1		%	ALRT	0.02	0.1		B1 only applies to positive detects	
SREV	CALCIUM	FOUND	68.02	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	100	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND	1.04	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	104	1		%	++	0.1	0.5			
SREV	SODIUM	FOUND	99.29	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	99	1		%	++	0.2	1			
SREV	YTTRIUM	REC	97.77	1		%	++	0.001	0.005			

~~L56331-01~~

Tag: 1 Measured: 12/26/2019 12:25:15 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	B-MWMT	.17	2	B	mg/L	++	0.04	0.2		B1	
SREV	PHOSPHORUS	P-MWMT		2	U	mg/L	++	0.2	1		DB	
NEED	YTTRIUM	REC	103	2		%	++	0.001	0.005			

L56331-02 Tag: 1 Measured: 12/26/2019 12:29:05 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	B-MWMT	.19	2	B	mg/L	++	0.04	0.2		B1	
SREV	CALCIUM	CA-MWMT	524	2		mg/L	++	0.2	1		BA	
NEED	YTTRIUM	REC	98.1	2		%	++	0.001	0.005			

L56331-03 Tag: 1 Measured: 12/26/2019 12:32:56 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	B-MWMT	.14	2	B	mg/L	++	0.04	0.2		B1	
SREV	CALCIUM	CA-MWMT	533	2		mg/L	++	0.2	1		BA	
SREV	SODIUM	NA-MWMT	13.7	2		mg/L	++	0.4	2		B1	
NEED	YTTRIUM	REC	100	2		%	++	0.001	0.005			

L56331-04 Tag: 1 Measured: 12/26/2019 12:36:46 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	B-MWMT	.23	2		mg/L	++	0.04	0.2		B1	
SREV	CALCIUM	CA-MWMT	518	2		mg/L	++	0.2	1		BA	
NEED	YTTRIUM	REC	97.2	2		%	++	0.001	0.005			

L56331-05 Tag: 1 Measured: 12/26/2019 12:40:37 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	B-MWMT	.12	1		mg/L	++	0.02	0.1		B1	
NEED	CALCIUM	REG	477	1		mg/L	++	0.1	0.5		BA	
NEED	PHOSPHORUS	REG		1	U	mg/L	++	0.1	0.5			
SREV	SODIUM	NA-MWMT	24.2	1		mg/L	++	0.2	1		B1	
NEED	YTTRIUM	REC	104	1		%	++	0.001	0.005			

L56331-05MS2 Tag: 1 Measured: 12/26/2019 12:44:28 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND	0.6	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	96	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	547.4	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	104	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND	0.78	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	78	1		%	++	0.1	0.5			
SREV	SODIUM	FOUND	120.6	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	96	1		%	++	0.2	1			
SREV	YTTRIUM	REC	102.28	1		%	++	0.001	0.005			

L56331-05MSD2

Tag: 1 Measured: 12/26/2019 12:48:17 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND	0.605	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	97	1		%	++	0.02	0.1			
SREV	BORON	RPD	1	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	559.4	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	121	1		%	++	0.1	0.5			
SREV	CALCIUM	RPD	2	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND	0.75	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	75	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	RPD	4	1		%	++	0.1	0.5			
SREV	SODIUM	FOUND	121.7	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	97	1		%	++	0.2	1			
SREV	SODIUM	RPD	1	1		%	++	0.2	1			
SREV	YTTRIUM	REC	104.78	1		%	++	0.001	0.005			

L56331-06

Tag: 1 Measured: 12/26/2019 12:52:07 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	B-MWMT	.16	1		mg/L	++	0.02	0.1		B1	
NEED	CALCIUM	REG	215	1		mg/L	++	0.1	0.5			
NEED	PHOSPHORUS	REG		1	U	mg/L	++	0.1	0.5			
NEED	SODIUM	REG	61.6	1		mg/L	++	0.2	1			
NEED	YTTRIUM	REC	96.3	1		%	++	0.001	0.005			

WG488806CCV1

Tag: Measured: 12/26/2019 12:55:58 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND	0.988	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	99	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	49.11	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	98	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND	2.45	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	98	1		%	++	0.1	0.5			
SREV	SODIUM	FOUND	48.78	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	98	1		%	++	0.2	1			
SREV	YTTRIUM	REC	94.65	1		%	++	0.001	0.005			

WG488806CCB1

Tag: Measured: 12/26/2019 12:59:46 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND		1	U	mg/L	++	0.02	0.1			
SREV	CALCIUM	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	SODIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	YTTRIUM	REC	96.48	1		%	++	0.001	0.005			

L56331-06SDL

Tag: Measured: 12/26/2019 1:03:42 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	D	3	1		%	++	0.02	0.1			
SREV	BORON	FOUND	0.033	1	B	mg/L	++	0.02	0.1			
SREV	BORON	REG	0.165	1	B	mg/L	++	0.02	0.1			
SREV	CALCIUM	D	2	1		%	++	0.1	0.5			
SREV	CALCIUM	FOUND	43.96	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REG	219.8	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	D		1	U	%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REG	0	1	U	mg/L	++	0.1	0.5			
SREV	SODIUM	D	3	1		%	++	0.2	1			
SREV	SODIUM	FOUND	12.7	1		mg/L	++	0.2	1			
SREV	SODIUM	REG	63.5	1		mg/L	++	0.2	1			
SREV	YTTRIUM	REC	93.72	1		%	++	0.001	0.005			

L56331-07

Tag: 1 Measured: 12/26/2019 1:07:36 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	B-MWMT	.12	2	B	mg/L	++	0.04	0.2		B1	
SREV	CALCIUM	CA-MWMT	520	2		mg/L	++	0.2	1		BA	
SREV	SODIUM	NA-MWMT	25.9	2		mg/L	++	0.4	2		B1	
NEED	YTTRIUM	REC	100	2		%	++	0.001	0.005			

L56331-08

Tag: 1 Measured: 12/26/2019 1:11:29 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	B-MWMT	.13	2	B	mg/L	++	0.04	0.2		B1	
SREV	CALCIUM	CA-MWMT	502	2		mg/L	++	0.2	1		BA	
SREV	SODIUM	NA-MWMT	22.3	2		mg/L	++	0.4	2		B1	
NEED	YTTRIUM	REC	99.4	2		%	++	0.001	0.005			

L56331-09

Tag: 1 Measured: 12/26/2019 1:15:21 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	B-MWMT	.15	2	B	mg/L	++	0.04	0.2		B1	
REDO	PHOSPHORUS	REG		2	LU	mg/L	LOW	0.2	1			
NEED	YTTRIUM	REC	104	2		%	++	0.001	0.005			

WG488806CCV2

Tag: Measured: 12/26/2019 1:19:20 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND	0.983	1		mg/L	++	0.02	0.1			
SREV	BORON	REC	98	1		%	++	0.02	0.1			
SREV	CALCIUM	FOUND	48.34	1		mg/L	++	0.1	0.5			
SREV	CALCIUM	REC	97	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND	2.43	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	97	1		%	++	0.1	0.5			
SREV	SODIUM	FOUND	47.96	1		mg/L	++	0.2	1			
SREV	SODIUM	REC	96	1		%	++	0.2	1			
SREV	YTTRIUM	REC	99.56	1		%	++	0.001	0.005			

WG488806CCB2

Tag:

Measured: 12/26/2019 1:23:07 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	BORON	FOUND		1	U	mg/L	++	0.02	0.1			
SREV	CALCIUM	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	SODIUM	FOUND		1	U	mg/L	++	0.2	1			
SREV	YTTRIUM	REC	98.11	1		%	++	0.001	0.005			

WG488806 Extended Qualifiers with Case Narratives

L56331-01	BORON	B1	Target analytes detected in the prep blank (PBS) above the method reporting limit. The MWMT fluid is passed through the analytical column as part of the preparation procedure, resulting in trace contamination of some analytes. Boron contamination in MWMT solution caused the control sample (LFB) to have recovery above method limits.
L56331-02	BORON		
L56331-03	BORON		
	SODIUM		
L56331-04	BORON		
L56331-05	BORON		
	SODIUM		
L56331-06	BORON		
L56331-07	BORON		
	SODIUM		
L56331-08	BORON		
	SODIUM		
L56331-09	BORON		
WG488184PBS	BORON		
	SODIUM		

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)
Ag 328.068 {103}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000601	0.033897	0.000000	1.000000
Al 396.152 { 85}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000011	0.022278	0.000000	1.000000
As 189.042 {478}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000034	0.000920	0.000000	1.000000
B 208.959 {461}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000050	0.005649	0.000000	1.000000
Ba 455.403 { 74}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.002034	1.933745	0.000000	1.000000
Be 313.042 {108}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.005699	1.356414	0.000000	1.000000
Bi 223.061 {451}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000062	0.001284	0.000000	1.000000
Ca 315.887 {107}	12/26/2019 11:49:46	12/26/2019 11:49:46	Linear	None	-0.006022	0.015721	0.000000	1.000000
Cd 214.438 {457}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000139	0.034560	0.000000	1.000000
Cd 226.502 {449}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000028	0.028115	0.000000	1.000000
Co 228.616 {447}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000017	0.009369	0.000000	1.000000
Cr 205.560 {464}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000026	0.011208	0.000000	1.000000
Cr 267.716 {126}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000129	0.024615	0.000000	1.000000
Cu 324.754 {104}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000643	0.042175	0.000000	1.000000
Fe 240.488 {140}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000093	0.009127	0.000000	1.000000
Fe 259.940 {130}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000135	0.023989	0.000000	1.000000
Ga 294.364 {114}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000002	0.002025	0.000000	1.000000
K 766.490 { 44}	12/26/2019 11:49:46	12/26/2019 11:49:46	Linear	None	0.001615	0.011406	0.000000	1.000000
Li 670.784 { 50}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.003013	0.341733	0.000000	1.000000
Mg 279.079 {121}	12/26/2019 11:49:46	12/26/2019 11:49:46	Linear	None	0.000569	0.003137	0.000000	1.000000
Mn 257.610 {131}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000419	0.141888	0.000000	1.000000
Mo 202.030 {467}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000010	0.006783	0.000000	1.000000
Na 589.592 { 57}	12/26/2019 11:49:46	12/26/2019 11:49:46	Linear	None	0.006656	0.062965	0.000000	1.000000
Ni 231.604 {446}	12/26/2019 11:49:46	12/26/2019 11:49:46	Linear	None	0.000002	0.007000	0.000000	1.000000
P 214.914 {457}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000014	0.000721	0.000000	1.000000
Pb 220.353 {453}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000017	0.001790	0.000000	1.000000
S 182.034 {485}	12/26/2019 11:49:46	12/26/2019 11:49:46	Linear	None	0.000107	0.000953	0.000000	1.000000
Sb 206.833 {463}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000010	0.001276	0.000000	1.000000
Sc 361.384 { 93}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000005	0.550549	0.000000	1.000000
Se 196.090 {472}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000006	0.000853	0.000000	1.000000
Si 251.611 {134}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000036	0.007288	0.000000	1.000000
Si 251.611 {134}2	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000036	0.007288	0.000000	1.000000
Sn 189.989 {477}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000005	0.001594	0.000000	1.000000
Sr 421.552 { 80}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000992	1.892749	0.000000	1.000000
Ti 334.941 {101}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000314	0.129423	0.000000	1.000000
Tl 190.856 {477}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000013	0.001132	0.000000	1.000000
V 292.402 {115}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000041	0.032444	0.000000	1.000000
Y 371.030 { 91}*	12/26/2019 11:49:46	12/26/2019 11:49:46	Linear	None	21216.109	-535.65276	0.000000	1.000000
Zn 206.200 {463}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	-0.000013	0.010213	0.000000	1.000000
Zn 213.856 {457}	12/26/2019 11:45:53	12/26/2019 11:45:53	Linear	None	0.000016	0.016206	0.000000	1.000000

Element, Wavelength and Order	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope		QC Norm	
						Slope	Y-int	Slope factor	Offset
Ag 328.068 {103}	0.999999	0.000025	0.005755	0.019184	OK.	1.000000	0.000000	1	0
Al 396.152 { 85}	0.999995	0.000488	0.013766	0.045887	OK.	1.000000	0.000000	1	0
As 189.042 {478}	0.999998	0.000007	0.018608	0.062025	OK.	1.000000	0.000000	1	0
B 208.959 {461}	0.999997	0.000049	0.004367	0.014558	OK.	1.000000	0.000000	1	0
Ba 455.403 { 74}	0.999999	0.004464	0.000283	0.000945	OK.	1.000000	0.000000	1	0
Be 313.042 {108}	0.999992	0.007677	0.000188	0.000628	OK.	1.000000	0.000000	1	0
Bi 223.061 {451}	1.000000	0.000003	0.021490	0.071633	OK.	1.000000	0.000000	1	0
Ca 315.887 {107}	1.000000	0.000779	0.014256	0.047520	OK.	1.000000	0.000000	1	0
Cd 214.438 {457}	0.999998	0.000101	0.000750	0.002498	OK.	1.000000	0.000000	1	0
Cd 226.502 {449}	1.000000	0.000002	0.001045	0.003485	OK.	1.000000	0.000000	1	0
Co 228.616 {447}	1.000000	0.000009	0.002875	0.009585	OK.	1.000000	0.000000	1	0
Cr 205.560 {464}	0.999998	0.000073	0.002579	0.008597	OK.	1.000000	0.000000	1	0
Cr 267.716 {126}	0.999999	0.000136	0.006055	0.020183	OK.	1.000000	0.000000	1	0
Cu 324.754 {104}	0.999997	0.000152	0.005821	0.019402	OK.	1.000000	0.000000	1	0
Fe 240.488 {140}	1.000000	0.000001	0.012179	0.040596	OK.	1.000000	0.000000	1	0
Fe 259.940 {130}	1.000000	0.000067	0.004184	0.013948	OK.	1.000000	0.000000	1	0
Ga 294.364 {114}	0.999668	0.000073	0.060504	0.201681	OK.	1.000000	0.000000	1	0
K 766.490 { 44}	0.999999	0.000802	0.054147	0.180492	OK.	1.000000	0.000000	1	0
Li 670.784 { 50}	0.999992	0.001958	0.001989	0.006631	OK.	1.000000	0.000000	1	0
Mg 279.079 {121}	0.999996	0.000519	0.040240	0.134132	OK.	1.000000	0.000000	1	0
Mn 257.610 {131}	0.999997	0.000497	0.000737	0.002455	OK.	1.000000	0.000000	1	0
Mo 202.030 {467}	0.999990	0.000042	0.003181	0.010605	OK.	1.000000	0.000000	1	0
Na 589.592 { 57}	1.000000	0.000825	0.010184	0.033948	OK.	1.000000	0.000000	1	0
Ni 231.604 {446}	1.000000	0.000000	0.004103	0.013678	OK.	1.000000	0.000000	1	0
P 214.914 {457}	0.999956	0.000024	0.034858	0.116194	OK.	1.000000	0.000000	1	0
Pb 220.353 {453}	0.999980	0.000040	0.015242	0.050807	OK.	1.000000	0.000000	1	0
S 182.034 {485}	0.999998	0.000051	0.022435	0.074784	OK.	1.000000	0.000000	1	0
Sb 206.833 {463}	0.999854	0.000031	0.017957	0.059857	OK.	1.000000	0.000000	1	0
Sc 361.384 { 93}	1.000000	0.000202	0.000499	0.001664	OK.	1.000000	0.000000	1	0
Se 196.090 {472}	0.999995	0.000010	0.023428	0.078093	OK.	1.000000	0.000000	1	0
Si 251.611 {134}	1.000000	0.000007	0.014093	0.046978	OK.	1.000000	0.000000	1	0
Si 251.611 {134}2	1.000000	0.000007	0.014093	0.046978	OK.	1.000000	0.000000	1	0
Sn 189.989 {477}	0.999992	0.000023	0.010343	0.034476	OK.	1.000000	0.000000	1	0
Sr 421.552 { 80}	1.000000	0.002250	0.000221	0.000735	OK.	1.000000	0.000000	1	0
Ti 334.941 {101}	0.999999	0.000122	0.001482	0.004941	OK.	1.000000	0.000000	1	0
Tl 190.856 {477}	1.000000	0.000007	0.020704	0.069014	OK.	1.000000	0.000000	1	0
V 292.402 {115}	1.000000	0.000001	0.004477	0.014922	OK.	1.000000	0.000000	1	0
Y 371.030 { 91}*	0.654203	379.22044	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Zn 206.200 {463}	0.999999	0.000017	0.001974	0.006582	OK.	1.000000	0.000000	1	0
Zn 213.856 {457}	0.999998	0.000048	0.001269	0.004229	OK.	1.000000	0.000000	1	0

CALIBRATION REAGENTS

6010/200.7 Reagent Sheet

1% Calibration Standards			10% Calibration Standards		
CLPSTD1:	**	SCN	CLPTSTD1:	**	SCN
CLPSTD2:	II191210-2	SCN	CLPTSTD2:	II191209-3	SCN
CLPSTD3:	II191209-1	SCN	CLPTSTD3:	II191127-3	SCN

Yttrium (Internal Standard) = PCN59951 EXP: 12/30/2020

**=CALSTD1 is a 2X dilution on CALSTD2 using either 1% or 10% Blank as the dilutent.

Blank Solutions:

Nitric acid:	60422	PCN	Nitric acid:	60422	PCN
Hydrochloric acid:	60374	PCN	Hydrochloric acid:	60375	PCN

VERIFIED BY: JLW 12/26/19

ICPSTD

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Metals Analysis

WG488806 **ICP MWMT**

Sample	Date	SCN	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Cd	Co	Cr	Cr	Cu	Fe	Fe	Ga	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Se	Si	SiO2	Sn	Sr	Ti	Tl	V
WG488806ICV	12/26/19 11:49	II191209-2				X				X															X		X			X									
WG488806ICB	12/26/19 11:53					X				X															X		X			X									
WG488806PQV	12/26/19 11:57	II191223-3				X				X															X		X												
WG488806ICSAB	12/26/19 12:01	II191127-4				X				X															X		X												
WG488806ULRV	12/26/19 12:09	II191113-1				X				X															X		X												
WG488184PBS	12/26/19 12:17		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WG488184LFB1	12/26/19 12:21	II191204-3				X				X															X		X												
L56331-01	12/26/19 12:25					X																					X												
L56331-02	12/26/19 12:29					X				X																													
L56331-03	12/26/19 12:32					X				X															X														
L56331-04	12/26/19 12:36					X				X																													
L56331-05	12/26/19 12:40					X																			X														
L56331-05MS2	12/26/19 12:44	II191204-3				X				X															X		X												
L56331-05MSD2	12/26/19 12:48	II191204-3				X				X															X		X												
L56331-06	12/26/19 12:52					X																																	
WG488806CCV1	12/26/19 12:55	II191204-1				X				X															X		X												
WG488806CCB1	12/26/19 12:59		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L56331-06SDL	12/26/19 13:03					X				X															X		X												
L56331-07	12/26/19 13:07					X				X															X														
L56331-08	12/26/19 13:11					X				X															X														
L56331-09	12/26/19 13:15					X																																	
WG488806CCV2	12/26/19 13:19	II191204-1				X				X															X		X												
WG488806CCB2	12/26/19 13:23		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

L56331-2006231417

ICP MWMT

QC List Type: QC-ICP-846
QCListMatClass: LIQUID
Bench Sheet List: I-ICP-6010
QC Ref: MA-ICP-SOIL-6010
Group ID: MA-G-ICP_-MWMT
Method Ref: M6010B
SOP Ref: SOPII012

WG488846

ACZ Laboratories, Inc

Instrument ID: ICP8
Analyst: JLW
ACZ Dept: 33
Create Date: 12/26/2019 14:28
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	PMWMT	Dilution
1	WG488846ICV	II191209-2			1			✓	1
2	WG488846ICB	NONE			1			✓	1
3	WG488846PQV	II191223-3			1			✓	1
4	WG488846ICSAB	II191127-4			1			✓	1
5	WG488846ULRV	II191113-1			1			✓	1
6	WG488184PBS	NONE			1			✓	1
7	L56331-05	STSB33_0.5-3					3360	✓	1
8	L56331-05MS2	II191204-3			1			✓	1
9	L56331-05MSD2	II191204-3			1			✓	1
10	L56331-09	STSB35_6-15			1		4970	✓	5
11	L56331-09SDL	NONE			1			✓	5
12	WG488184LFB1	II191204-3			1			✓	1
13	WG488846CCV	II191226-1			1			✓	1
14	WG488846CCB	NONE			1			✓	1

JLW 12/27/19

Sample	Login Comments
L56331-05MS2	ICP Spike
L56331-05MSD2	ICP Spike
L56331-09	BUCKET || hand delivered to soils
WG488184LFB1	ICP LFB

Report Comments: Adjusted input file to represent LFB being ran after PBS. JLW 12/27/19

Internal Comments

AREV: JLW 12/27/19
Initials, Date

SREV: 12-27-19
Initials, Date

12/26/2019 2:28:53 PM 10120

ACZ Laboratories, Inc.

ICP DATA REVIEW CHECKLIST

Reviewed By:	JLW
Date:	12/27/19
Approved By:	[illegible]
Date:	12-27-19

Work Group:	488846
Sample Type:	MWMT
Analysis Date:	12/26/19
Analyst:	JLW

Instrument Checklist	**Yes**	**No**	**N / A**
1) Is the correct run date associated with the workgroup?	✓		
2) Are all of the QC critera listed in LIMS within specified limits? **		✓	
3) Are all samples requiring re-analysis / re-digestion at REDO / REDX status?			✓
4) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
5) Is a current standard/reagent form attached to the workgroup?	✓		
6) Have all dilutions performed at the bench been checked off on the benchsheet?	✓		
7) Has any sample on a 2x dilution been checked for proper mixing (review raw data)?			✓
8) Is any sample analyzed on dilution appropriately "D" qualified (not required for o-cal, EC, TDS)?	✓		
9) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?	✓		
10) Are any samples that have recoveries outside of limits for the Yttrium Internal Standard set to REDO?			✓
11) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

For any item listed above that is checked "No" state the problem and corrective action / resolution in the sections below.

QC/Sample ID	Analytical Problem	Corrective action
ICV	P RSD ↑	RSD <5% ✓ ok
L56331-05	MSD2 P ↓	Mn

FRMII009.06.13.14

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488846

Date Reported: 27-Dec-19
Run ID: R1765855
Date Analyzed: 26-Dec-19
ICAL Workgroup:
Instrument ID: ICP8

WG488846ICV

Tag: **Measured:** 12/26/2019 10:07:22 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	ANTIMONY	FOUND	4.063	1		mg/L	++	0.03	0.2			
FAIL	ANTIMONY	REC	102	1		%	++	0.03	0.2			
FAIL	ANTIMONY	RSD	3.319	1		mg/L	ALRT	0.03	0.15			
SREV	PHOSPHORUS	FOUND	5.12	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	102	1		%	++	0.1	0.5			
SREV	PHOSPHORUS	RSD	3.623	1		mg/L	ALRT	0.1	0.5			
SREV	YTTRIUM	REC	93.92	1		%	++	0.001	0.005			

WG488846ICB

Tag: **Measured:** 12/26/2019 10:11:06 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ANTIMONY	FOUND		1	U	mg/L	++	0.03	0.2			
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	YTTRIUM	REC	99.63	1		%	++	0.001	0.005			

WG488846PQV

Tag: **Measured:** 12/26/2019 10:15:03 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	FOUND	0.54	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	108	1		%	++	0.1	0.5			
SREV	YTTRIUM	REC	101.12	1		%	++	0.001	0.005			

WG488846ICSAB

Tag: **Measured:** 12/26/2019 10:18:59 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	FOUND	4.95	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	99	1		%	++	0.1	0.5			
SREV	YTTRIUM	REC	97.68	1		%	++	0.001	0.005			

WG488846ULRV

Tag: **Measured:** 12/26/2019 10:26:46 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	FOUND	100.4	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	100	1		%	++	0.1	0.5			
SREV	YTTRIUM	REC	96.42	1		%	++	0.001	0.005			

WG488184PBS

Tag: 2 **Measured:** 12/26/2019 10:34:59 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	YTTRIUM	REC	102.55	1		%	++	0.001	0.005			

WG488184LFB1 Tag: 2 Measured: 12/26/2019 10:38:56 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	FOUND	1.06	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	106	1		%	++	0.1	0.5			
SREV	YTTRIUM	REC	99.71	1		%	++	0.001	0.005			

L56331-05 Tag: 2 Measured: 12/26/2019 10:42:48 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	PHOSPHORUS	REG		1	U	mg/L	++	0.1	0.5			
NEED	YTTRIUM	REC	104	1		%	++	0.001	0.005			

L56331-05MS2 Tag: 2 Measured: 12/26/2019 10:46:40 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	FOUND	0.77	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	77	1		%	++	0.1	0.5			
SREV	YTTRIUM	REC	101.49	1		%	++	0.001	0.005			

L56331-05MSD2 Tag: 2 Measured: 12/26/2019 10:50:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	FOUND	0.73	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	73	1		%	ALRT	0.1	0.5		MA	Applies to sample 9; 5 was reported from another run
SREV	PHOSPHORUS	RPD	5	1		%	++	0.1	0.5			
SREV	YTTRIUM	REC	103.84	1		%	++	0.001	0.005			

L56331-09 Tag: 2 Measured: 12/26/2019 10:54:19 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	P-MWMT		5	U	mg/L	++	0.5	3		DB EA MA	
NEED	YTTRIUM	REC	102	5		%	++	0.001	0.005			

L56331-09SDL Tag: 1 Measured: 12/26/2019 10:58:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	D		5	U	%	++	0.5	3			
SREV	PHOSPHORUS	FOUND		5	U	mg/L	++	0.5	3			
SREV	PHOSPHORUS	REG	0	5	U	mg/L	++	0.5	3			
SREV	YTTRIUM	REC	99.48	5		%	++	0.001	0.005			

WG488846CCV Tag: Measured: 12/26/2019 11:02:05 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	FOUND	2.5	1		mg/L	++	0.1	0.5			
SREV	PHOSPHORUS	REC	100	1		%	++	0.1	0.5			
SREV	YTTRIUM	REC	97.12	1		%	++	0.001	0.005			

WG488846CCB Tag: Measured: 12/26/2019 11:05:53 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	PHOSPHORUS	FOUND		1	U	mg/L	++	0.1	0.5			
SREV	YTTRIUM	REC	97.22	1		%	++	0.001	0.005			

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)
Ag 328.068 {103}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000701	0.034274	0.000000	1.000000
Al 396.152 { 85}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.001142	0.022653	0.000000	1.000000
As 189.042 {478}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000030	0.000932	0.000000	1.000000
B 208.959 {461}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000097	0.005750	0.000000	1.000000
Ba 455.403 { 74}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.018950	1.948422	0.000000	1.000000
Be 313.042 {108}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.013563	1.368685	0.000000	1.000000
Bi 223.061 {451}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	0.000067	0.001284	0.000000	1.000000
Ca 315.887 {107}	12/26/2019 22:07:18	12/26/2019 22:07:18	Linear	None	-0.006427	0.015880	0.000000	1.000000
Cd 214.438 {457}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000231	0.034889	0.000000	1.000000
Cd 226.502 {449}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000038	0.028379	0.000000	1.000000
Co 228.616 {447}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000008	0.009414	0.000000	1.000000
Cr 205.560 {464}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000136	0.011355	0.000000	1.000000
Cr 267.716 {126}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000464	0.024898	0.000000	1.000000
Cu 324.754 {104}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	0.000422	0.042638	0.000000	1.000000
Fe 240.488 {140}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000075	0.009230	0.000000	1.000000
Fe 259.940 {130}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000208	0.024240	0.000000	1.000000
Ga 294.364 {114}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	0.000018	0.002007	0.000000	1.000000
K 766.490 { 44}	12/26/2019 22:07:18	12/26/2019 22:07:18	Linear	None	0.001434	0.011578	0.000000	1.000000
Li 670.784 { 50}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.007763	0.346346	0.000000	1.000000
Mg 279.079 {121}	12/26/2019 22:07:18	12/26/2019 22:07:18	Linear	None	0.000566	0.003177	0.000000	1.000000
Mn 257.610 {131}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000535	0.143623	0.000000	1.000000
Mo 202.030 {467}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000038	0.006859	0.000000	1.000000
Na 589.592 { 57}	12/26/2019 22:07:18	12/26/2019 22:07:18	Linear	None	0.012689	0.063858	0.000000	1.000000
Ni 231.604 {446}	12/26/2019 22:07:18	12/26/2019 22:07:18	Linear	None	-0.000059	0.007103	0.000000	1.000000
P 214.914 {457}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000023	0.000729	0.000000	1.000000
Pb 220.353 {453}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	0.000012	0.001821	0.000000	1.000000
S 182.034 {485}	12/26/2019 22:07:18	12/26/2019 22:07:18	Linear	None	0.000049	0.000957	0.000000	1.000000
Sb 206.833 {463}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000018	0.001305	0.000000	1.000000
Sc 361.384 { 93}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.004337	0.554930	0.000000	1.000000
Se 196.090 {472}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	0.000021	0.000846	0.000000	1.000000
Si 251.611 {134}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000209	0.007380	0.000000	1.000000
Si 251.611 {134}2	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000209	0.007380	0.000000	1.000000
Sn 189.989 {477}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000005	0.001611	0.000000	1.000000
Sr 421.552 { 80}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.017450	1.909092	0.000000	1.000000
Ti 334.941 {101}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000158	0.131083	0.000000	1.000000
Tl 190.856 {477}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000067	0.001149	0.000000	1.000000
V 292.402 {115}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000215	0.032980	0.000000	1.000000
Y 371.030 { 91}*	12/26/2019 22:07:18	12/26/2019 22:07:18	Linear	None	19954.640	-201.14841	0.000000	1.000000
Zn 206.200 {463}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000045	0.010346	0.000000	1.000000
Zn 213.856 {457}	12/26/2019 22:03:25	12/26/2019 22:03:25	Linear	None	-0.000032	0.016437	0.000000	1.000000

Element, Wavelength and Order	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope		QC Norm	
						Slope	Y-int	Slope factor	Offset
Ag 328.068 {103}	0.999875	0.000383	0.006095	0.020318	OK.	1.000000	0.000000	1	0
Al 396.152 { 85}	0.999886	0.002438	0.014497	0.048324	OK.	1.000000	0.000000	1	0
As 189.042 {478}	0.999958	0.000030	0.019537	0.065122	OK.	1.000000	0.000000	1	0
B 208.959 {461}	0.999909	0.000280	0.004601	0.015337	OK.	1.000000	0.000000	1	0
Ba 455.403 { 74}	0.999858	0.046377	0.000301	0.001003	OK.	1.000000	0.000000	1	0
Be 313.042 {108}	0.999907	0.026372	0.000200	0.000666	OK.	1.000000	0.000000	1	0
Bi 223.061 {451}	0.999989	0.000022	0.022998	0.076661	OK.	1.000000	0.000000	1	0
Ca 315.887 {107}	0.999999	0.001091	0.015096	0.050320	OK.	1.000000	0.000000	1	0
Cd 214.438 {457}	0.999975	0.000350	0.000791	0.002638	OK.	1.000000	0.000000	1	0
Cd 226.502 {449}	0.999985	0.000218	0.001108	0.003693	OK.	1.000000	0.000000	1	0
Co 228.616 {447}	0.999989	0.000062	0.003046	0.010155	OK.	1.000000	0.000000	1	0
Cr 205.560 {464}	0.999973	0.000297	0.002720	0.009066	OK.	1.000000	0.000000	1	0
Cr 267.716 {126}	0.999948	0.000896	0.006448	0.021495	OK.	1.000000	0.000000	1	0
Cu 324.754 {104}	0.999945	0.000633	0.006167	0.020556	OK.	1.000000	0.000000	1	0
Fe 240.488 {140}	0.999952	0.000319	0.013007	0.043357	OK.	1.000000	0.000000	1	0
Fe 259.940 {130}	0.999937	0.000962	0.004437	0.014788	OK.	1.000000	0.000000	1	0
Ga 294.364 {114}	0.999561	0.000083	0.065336	0.217786	OK.	1.000000	0.000000	1	0
K 766.490 { 44}	1.000000	0.000599	0.056995	0.189984	OK.	1.000000	0.000000	1	0
Li 670.784 { 50}	0.999867	0.007984	0.002102	0.007008	OK.	1.000000	0.000000	1	0
Mg 279.079 {121}	0.999993	0.000670	0.042706	0.142352	OK.	1.000000	0.000000	1	0
Mn 257.610 {131}	0.999969	0.001596	0.000782	0.002607	OK.	1.000000	0.000000	1	0
Mo 202.030 {467}	0.999978	0.000064	0.003370	0.011232	OK.	1.000000	0.000000	1	0
Na 589.592 { 57}	1.000000	0.002139	0.010757	0.035857	OK.	1.000000	0.000000	1	0
Ni 231.604 {446}	1.000000	0.000000	0.004373	0.014578	OK.	1.000000	0.000000	1	0
P 214.914 {457}	0.999963	0.000022	0.037000	0.123332	OK.	1.000000	0.000000	1	0
Pb 220.353 {453}	0.999998	0.000012	0.016109	0.053698	OK.	1.000000	0.000000	1	0
S 182.034 {485}	0.999997	0.000068	0.024030	0.080099	OK.	1.000000	0.000000	1	0
Sb 206.833 {463}	0.999880	0.000029	0.018936	0.063120	OK.	1.000000	0.000000	1	0
Sc 361.384 { 93}	0.999914	0.010315	0.000531	0.001769	OK.	1.000000	0.000000	1	0
Se 196.090 {472}	0.999994	0.000010	0.025186	0.083952	OK.	1.000000	0.000000	1	0
Si 251.611 {134}	0.999908	0.000359	0.014921	0.049737	OK.	1.000000	0.000000	1	0
Si 251.611 {134}2	0.999908	0.000359	0.014921	0.049737	OK.	1.000000	0.000000	1	0
Sn 189.989 {477}	0.999978	0.000038	0.011028	0.036761	OK.	1.000000	0.000000	1	0
Sr 421.552 { 80}	0.999877	0.042409	0.000234	0.000781	OK.	1.000000	0.000000	1	0
Ti 334.941 {101}	0.999909	0.001255	0.001571	0.005236	OK.	1.000000	0.000000	1	0
Tl 190.856 {477}	0.999962	0.000071	0.021805	0.072683	OK.	1.000000	0.000000	1	0
V 292.402 {115}	0.999870	0.000362	0.004718	0.015728	OK.	1.000000	0.000000	1	0
Y 371.030 { 91}*	0.204427	589.82685	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Zn 206.200 {463}	0.999972	0.000110	0.002087	0.006958	OK.	1.000000	0.000000	1	0
Zn 213.856 {457}	0.999943	0.000247	0.001333	0.004444	OK.	1.000000	0.000000	1	0

CALIBRATION REAGENTS

6010/200.7 Reagent Sheet

1% Calibration Standards			10% Calibration Standards		
CLPSTD1:	**	SCN	CLPTSTD1:	**	SCN
CLPSTD2:	II191210-2	SCN	CLPTSTD2:	II191209-3	SCN
CLPSTD3:	II191209-1	SCN	CLPTSTD3:	II191127-3	SCN

Yttrium (Internal Standard) = PCN59951 EXP: 12/30/2020

**=CALSTD1 is a 2X dilution on CALSTD2 using either 1% or 10% Blank as the dilutent.

Blank Solutions:

Nitric acid:	60422	PCN	Nitric acid:	60422	PCN
Hydrochloric acid:	60374	PCN	Hydrochloric acid:	60375	PCN

VERIFIED BY: JLW 12/27/19

ICPSTD

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Metals Analysis

WG488846 **ICP MWMT**

Sample	Date	SCN	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Cd	Co	Cr	Cr	Cu	Fe	Fe	Ga	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Se	Si	SiO2	Sn	Sr	Ti	Tl	V
WG488846ICV	12/26/19 22:07	II191209-2																									X			X									
WG488846ICB	12/26/19 22:11																										X			X									
WG488846PQV	12/26/19 22:15	II191223-3																									X												
WG488846ICSAB	12/26/19 22:18	II191127-4																									X												
WG488846ULRV	12/26/19 22:26	II191113-1																									X												
WG488184PBS	12/26/19 22:34		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WG488184LFB1	12/26/19 22:38	II191204-3																									X												
L56331-05	12/26/19 22:42																																						
L56331-05MS2	12/26/19 22:46	II191204-3																									X												
L56331-05MSD2	12/26/19 22:50	II191204-3																									X												
L56331-09	12/26/19 22:54																										X												
L56331-09SDL	12/26/19 22:58																										X												
WG488846CCV	12/26/19 23:02	II191226-1																									X												
WG488846CCB	12/26/19 23:05		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

L56331-2006231417

ICP Total Hot Plate

QC List Type: I-X-THP
QCListMatClass: LIQUID
Bench Sheet List: I-X-THP
QC Ref: NOQC
Group ID: IP-G-DIG-THP-MWMT
Method Ref: M6010B ICP
SOP Ref: SOPII018

WG488611

ACZ Laboratories, Inc

Instrument ID: METALSDIG
Analyst: kja
ACZ Dept: 30
Create Date: 12/20/2019 9:06
Start Date/Time: 12/20/2019 10:43
End Date/Time: 12/20/2019 15:43

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	SCN Volume (mL)	Sample Volume (mL)	Final Volume (mL)	Comments
1	WG488184PBS	NONE	mwmt		12/20/19 10:43		50	50	
2	L56331-01	STSB32_0.5-3	mwmt		12/20/19 11:08		50	50	
3	L56331-02	STSB32_6-15	mwmt		12/20/19 11:33		50	50	
4	L56331-03	STSB34_0.5-3	mwmt		12/20/19 11:58		50	50	
5	L56331-04	STSB34_6-15	mwmt		12/20/19 12:23		50	50	
6	L56331-05	STSB33_0.5-3	mwmt		12/20/19 12:48		50	50	
7	L56331-05MS2	II191204-3	mwmt		12/20/19 13:13	0.5	50	50	
8	L56331-05MSD2	II191204-3	mwmt		12/20/19 13:38	0.5	50	50	
9	L56331-06	STSB33_6-15	mwmt		12/20/19 14:03		50	50	
10	L56331-07	STSB33-FD_0.5-3	mwmt		12/20/19 14:28		50	50	
11	L56331-08	STSB35_0.5-3	mwmt		12/20/19 14:53		50	50	
12	L56331-09	STSB35_6-15	mwmt		12/20/19 15:18		50	50	
13	WG488184LFB1	II191204-3	mwmt		12/20/19 15:43	0.5	50	50	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS2	ICP Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184LFB1	ICP LFB

Report Comments: _____

Internal Comments _____

AREV: KJA 12/20/19
Initials, Date

SREV: JEH 12/23/19
Initials, Date

12/20/2019 4:15:21 PM 10120

ACZ Laboratories, Inc.

METALS PREP REVIEW CHECKLIST

AREV:	KJA
Date:	12/20/19
SREV:	MEH
Date:	12/23/19

Work Group:	488611
Sample Type:	THRMWMT
Prep Date:	12/20/19
Analyst:	KJA

	N/A	Yes	No
1.) Are all dilutions correct in LIMS and documented on the bench sheet ?	✓	✓	
2.) Is any sample prepared on dilution appropriately "D" qualified?	✓	✓	
3.) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?	✓	✓	
4.) Are all initial and final sample volumes correct in LIMS ?	✓	✓	
5.) Is the correct SCN entered for each spike and control standard (LFB or LCSW) ?	✓	✓	
6.) Are all SCN volumes correct in LIMS ?	✓	✓	
7.) Are all errors properly corrected (i.e. single-line crossout, dated & initialed) ?	✓	✓	
8.) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS ?		✓	

For any item listed above that is checked "No" state the problem and corrective action / resolution in the sections below.

QC/Sample ID	Problem	Corrective action

Disposable Vessel Lot #*: 19061257

Nitric acid PCN: 60424

Hydrochloric acid PCN: 60373

Digest Temp: 92 °C

Hot Block ID: DEENA 1

Comments:

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

FRMII014.05.18.11

ICP Total Hot Plate

QC List Type: I-X-THP
QCListMatClass: LIQUID
Bench Sheet List: I-X-THP
QC Ref: NOQC
Group ID: IP-G-DIG-THP-MWMT
Method Ref: M6010B ICP
SOP Ref: SOPII018

WG488611

ACZ Laboratories, Inc

Instrument ID: METALSDIG
Analyst: VJA
ACZ Dept: 30
Create Date: 12/20/2019 9:06
Start Date/Time:
End Date/Time:

L56331-2006231417

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	SCN Volume (mL)	Sample Volume (mL)	Final Volume (mL)	Comments
1	WG488184PBS	NONE							
2	L56331-01	STSB32_0.5-3							
3	L56331-02	STSB32_6-15							
4	L56331-03	STSB34_0.5-3							
5	L56331-04	STSB34_6-15							
6	L56331-05	STSB33_0.5-3							
7	L56331-05MS2	II191204-3							
8	L56331-05MSD2	II191204-3							
9	L56331-06	STSB33_6-15							
10	L56331-07	STSB33-FD_0.5-3							
11	L56331-08	STSB35_0.5-3							
12	L56331-09	STSB35_6-15							
13	WG488184LFB1	II191204-3							

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS2	ICP Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184LFB1	ICP LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/20/2019 9:07:04 AM 10120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488611

Date Reported: 23-Dec-19
Run ID: R1765513
Date Analyzed: 20-Dec-19
ICAL Workgroup:
Instrument ID: METALSDIG

WG488184PBS

Tag:

Measured: 12/20/2019 10:43:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-01

Tag:

Measured: 12/20/2019 11:08:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IP-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IP-MWMT	50	1		mL	++					

L56331-02

Tag:

Measured: 12/20/2019 11:33:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IP-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IP-MWMT	50	1		mL	++					

L56331-03

Tag:

Measured: 12/20/2019 11:58:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IP-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IP-MWMT	50	1		mL	++					

L56331-04

Tag:

Measured: 12/20/2019 12:23:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IP-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IP-MWMT	50	1		mL	++					

L56331-05

Tag:

Measured: 12/20/2019 12:48:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IP-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IP-MWMT	50	1		mL	++					

L56331-05MS2

Tag:

Measured: 12/20/2019 1:13:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	SCN VOLUME	PREP	0.5	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-05MSD2

Tag:

Measured: 12/20/2019 1:38:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	SCN VOLUME	PREP	0.5	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-06

Tag: Measured: 12/20/2019 2:03:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IP-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IP-MWMT	50	1		mL	++					

L56331-07

Tag: Measured: 12/20/2019 2:28:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IP-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IP-MWMT	50	1		mL	++					

L56331-08

Tag: Measured: 12/20/2019 2:53:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IP-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IP-MWMT	50	1		mL	++					

L56331-09

Tag: Measured: 12/20/2019 3:18:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	IP-MWMT	50	1		mL	++					
SREV	VOLUME, SAMPLE	IP-MWMT	50	1		mL	++					

WG488184LFB1

Tag: Measured: 12/20/2019 3:43:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FINAL VOLUME	PREP	50	1		mL	++					
SREV	SCN VOLUME	PREP	0.5	1		mL	++					
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

[redacted]

QC List Type: QC-CV-200
QCListMatClass: LIQUID
Bench Sheet List: I-CV-D
QC Ref: MA-HG-DW
Group ID: MA-G-HG-D-200
Method Ref: M245.1 CVAA
SOP Ref: SOPII005

WG488445

ACZ Laboratories, Inc

Instrument ID: M7600
Analyst: SLM
ACZ Dept: 33
Create Date: 12/18/2019 13:13
Start Date/Time:
End Date/Time:

L56331-2006231417

SEQ	ACZ ID	Client ID	SubSX	Pri	HGD200	Dilution	Comments
1	WG488445ICV	HG191216-3			✔	1	
2	WG488445ICB	NONE			✔	1	
3	WG488445PQV	HG191216-5			✔	1	
4	WG488445LRB	NONE			✔	1	
5	WG488445LFB	HG191216-6			✔	1	
6	L56382-04	GW-N43	SLM 12/20/19		✔	1	
7	L56382-04LFM	HG191216-6			✔	1	
8	L56382-04LFMD	HG191216-6			✔	1	
9	L56422-01	120619-KTC-0			✔	~~1~~ 2	DJ INSX
10	L56422-02	120619-KTC-1			✔	~~1~~	
11	L56422-03	120619-KTC-2			✔	~~1~~	
12	L56422-04	120619-KTC-3			✔	~~1~~	
13	L56422-05	120619-KTC-4			✔	~~1~~	
14	WG488445CCV1	HG191216-3			✔	1	
15	WG488445CCB1	NONE			✔	1	
16	L56422-06	120619-KTC-5			✔	~~1~~ 2	DJ INSX
17	L56422-07	120619-KTC-6			✔	~~1~~	
18	L56422-08	120619-KTC-7			✔	~~1~~	
19	L56422-09	120619-KTC-8			✔	~~1~~	
20	L56422-10	120619-KTC-9			✔	~~1~~	
21	~~L56422-10~~LFM	HG191216-6			✔	1	insx vol to dup DJ INSX L56430-01
22	~~L56422-10~~LFMD	HG191216-6			✔	1	

SLM 12/19/19

SLM 12/19/19

Report Comments:

Internal Comments

AREV: SLM 12/20/19
Initials, Date

SREV: USEH 12/20/19
Initials, Date

12/18/2019 1:13:50 PM 122019

HG-D-200

WG488445

ACZ Laboratories, Inc

QC List Type: QC-CV-200
QCListMatClass: LIQUID
Bench Sheet List: I-CV-D
QC Ref: MA-HG-DW
Group ID: MA-G-HG-D-200
Method Ref: M245.1 CVAA
SOP Ref: SOPII005

Instrument ID: M7600
Analyst:
ACZ Dept: 33
Create Date: 12/18/2019 13:13
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	HGD200	Dilution	Comments
23	**L56430-01**	GL191211401			☑	1	
24	**L56430-02**	GL191211402			☑	1	
25	**L56430-03**	GL191211403			☑	1	
26	WG488445CCV2	HG191216-3 1			☑	1	
27	WG488445CCB2	NONE	SLM 12/20/19		☑	1	
28	**L56430-04**	GL191211404			☑	1	
29	L56450-02	NS1		30	☑	1	
30	L56451-01	DPT-1			☑	1	
31	L56451-02	EPT-1			☑	1	
32	L56499-21	AKG191033			☑	1	
33	L56499-22	AKG191034			☑	1	
34	WG488445CCV3	HG191216-3 1			☑	1	
35	WG488445CCB3	NONE			☑	1	

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/18/2019 1:13:51 PM 122019

HG-D-200

QC List Type: QC-CV-200
QCListMatClass: LIQUID
Bench Sheet List: I-CV-D
QC Ref: MA-HG-DW
Group ID: MA-G-HG-D-200
Method Ref: M245.1 CVAA
SOP Ref: SOPII005

WG488445

ACZ Laboratories, Inc

Instrument ID: M7600
Analyst:
ACZ Dept: 33
Create Date: 12/18/2019 13:13
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56382-04	U,WF,R,GPCFA,Y ||
L56422-01	G || G ||
L56422-02	G || G ||
L56422-03	G || G ||
L56422-04	G || G ||
L56422-05	G || G ||
L56422-06	G || G ||
L56422-07	G || G ||
L56422-08	G || G ||
L56422-09	G || G ||
L56422-10	G || G ||
L56430-01	P,U,W,GPC,Y,T ||
L56430-02	P,U,W,GPC,Y,T ||
L56430-03	P,U,W,GPC,Y,T ||
L56430-04	P,U,W,GPC,Y,T ||
L56450-02	O(2),P,U,W,RPC,GPC,YG || O(2),P,LU,U,W,RPC,GPC,YG ||
L56451-01	LA,O,P,U,W,RPC,GPC,YG,B ||
L56451-02	LA,O,P,U,W,RPC,GPC,YG,B ||
L56499-21	P,U,W,RPC,GPC,Y,T ||
L56499-22	P,U,W,RPC,GPC,Y,T ||

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/18/2019 1:13:51 PM 122019

ACZ Laboratories, Inc.

HG-CVAA/SE-HY DATA REVIEW CHECKLIST

Data Reviewer: SLM
Date: 12/20/19

Approved: MEH
Date: 12/20/19

Work Group: 488445
Sample Type: HG-D-200
Analysis Date: 12/20/19
Analyst: SLM

	Yes	No	N/A
1.) Does the instrument calibration meet the specified method criteria? ($r \geq 0.995$)	✓		
2.) Was the low calibration standard dropped? If Yes, notify PM of change to PQL.		✓	
3.) Are all of the QC critera listed in LIMS within the acceptance limits?	✓		
4.) Are "H" flags for missed hold time appropriate?			✓
5.) Are all samples requiring re-analysis / re-digestion at REDO / REDX status?			✓
6.) Are all dilution factors correctly calculated and uploaded? (Soil, Sludge, Water)	✓		✓
7.) Is any sample prepped / analyzed on dilution appropriately "D" qualified (except o-cal)?	✓		✓
8.) Are dilutions for o-cals in the appropriate range? (explain if "B" or "U" is reported)			✓
9.) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?			✓
10.) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
11.) Is a current standard/reagent sheet attached to the workgroup?	✓		
12.) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

SLM 12/20/19

Continuing Calibration? no
Cal WG#: —
Digest Time In: 1418

Digest Date: 12/19/19
Digest Temp: 86°C
Digest Time Out: 1618

Disposable Vessel Lot #*: — 1906257-9305-GT

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
L56422-(1-10)	insx vol	DJ

Comments:

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

FRMII011.10.16.12

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488445

Date Reported: 20-Dec-19
Run ID: R1765445
Date Analyzed: 20-Dec-19
ICAL Workgroup:
Instrument ID: M7600

WG488445ICV

Tag: Measured: 12/20/2019 12:40:26 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00523 ✓	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	105	1		%	++	0.0002	0.001			

WG488445ICB

Tag: Measured: 12/20/2019 12:41:23 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND		1	U ✓	mg/L	++	0.0002	0.001			

WG488445PQV

Tag: Measured: 12/20/2019 12:42:19 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00095	1	B	mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	95	1	B	%	++	0.0002	0.001			

WG488445LRB

Tag: Measured: 12/20/2019 12:43:15 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND		1	U	mg/L	++	0.0002	0.001			

WG488445LFB

Tag: Measured: 12/20/2019 12:44:11 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.0019	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	95	1		%	++	0.0002	0.001			

L56382-04

Tag: Measured: 12/20/2019 12:45:08 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-D-200		1	U	mg/L	++	0.0002	0.001			

L56382-04LFM

Tag: Measured: 12/20/2019 12:46:04 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00193	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	96	1		%	++	0.0002	0.001			

L56382-04LFMD

Tag: Measured: 12/20/2019 12:47:01 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00193	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	96	1		%	++	0.0002	0.001			
SREV	MERCURY	RPD	0	1		%	++	0.0002	0.001			

ACZ Laboratories, Inc.

Report Generated By Teledyne Leeman QuickTrace

Analyst: ilab

Worksheet file: C:\Users\Public\Documents\Teledyne CETAC\QuickTrace\Worksheets\WG488445.wszf

Creation Date: 12/20/2019 12:37:18 PM

Comment:

Results

Sample Name	Type	Date/Time	Conc (ppb)	µAbs	%RSD	Residual	Flags	DF	% Recovery
Calibration Blank	STD	12/20/19 12:09:09 pm	0.000	11140	0.00	52.78		1.00	N/A
Replicates 11140.2									
Standard #1 (0.5 ppb)	STD	12/20/19 12:10:07 pm	0.500	81977	0.00	40.94		1.00	N/A
Replicates 81977.1									
Standard #2 (1.0 ppb)	STD	12/20/19 12:11:05 pm	1.000	148812	0.00	1.52		1.00	N/A
Replicates 148811.9									
Standard #3 (2.0 ppb)	STD	12/20/19 12:12:03 pm	2.000	289196	0.00	-31.06		1.00	N/A
Replicates 289196.4									
Standard #4 (5.0 ppb)	STD	12/20/19 12:13:01 pm	5.000	709246	0.00	-136.39		1.00	N/A
Replicates 709246.2									
Standard #5 (10.0ppb)	STD	12/20/19 12:14:00 pm	10.000	1465073	0.00	72.21		1.00	N/A
Replicates 1465073.4									

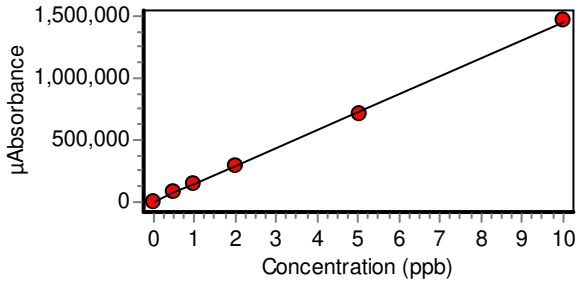
Calibration

Equation: Abs = 145111.459x + 3480.502 ✓

R2: 0.99960 ✓

SEE: 12407.9500

Flags:



ICV	ICV	12/20/19 12:40:26 pm	5.230	762738	0.00			1.00	104.64
Replicates 762737.8									
ICB	ICB	12/20/19 12:41:23 pm	-0.004	2964	0.00			1.00	N/A
Replicates 2963.8									
WG488445PQV	UNK	12/20/19 12:42:19 pm	0.950	141352	0.00			1.00	N/A
Replicates 141351.9									
WG488445LRB	UNK	12/20/19 12:43:15 pm	-0.007	2536	0.00			1.00	N/A
Replicates 2535.8									
WG488445LFB	UNK	12/20/19 12:44:11 pm	1.900	279475	0.00			1.00	N/A
Replicates 279474.9									
L56382-04	UNK	12/20/19 12:45:08 pm	-0.008	2309	0.00			1.00	N/A
Replicates 2309.1									

ACZ Laboratories, Inc.
Standards/Reagents Information
Mercury (waters) by CVAA
SOP#: II027.09.17.03
EPA methods: M245.1 & M7470A

Reagents	PCN	Expiration
HNO_3 (digestion)	59364	1/9/2021
$K_2S_2O_8$	59836	12/31/2020
H_2SO_4	58969	9/4/2021
$KMnO_4$	59255	5/31/2023
$SnCl_2$	60115	10/21/2024
HCl (for $SnCl_2$)	60374	5/17/2022
Hydroxylamine SO_4	58521	3/19/2024
NaCl	58452	9/30/2023

Standards	SCN	Expiration
Calibration Intermediate (1 mg/L):	HG191212-1	3/10/2020

VERIFIED BY: SLM 12/20/19

L56331-2006231417

HG-MWMT

QC List Type: QC-CV-SM
QCListMatClass: SOLID
Bench Sheet List: I-CV-MWMT
QC Ref: MA-HG-D-846
Group ID: MA-G-HG-MWMT
Method Ref: M7470A
SOP Ref: SOPII005

WG488654

ACZ Laboratories, Inc

Instrument ID: M7600
Analyst: SLM
ACZ Dept: 33
Create Date: 12/20/2019 12:54
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	HGMWMT	Dilution	Comments
1	WG488654ICV	HG191211-3			1	✓	1	
2	WG488654ICB	NONE			1	✓	1	
3	WG488654PQV	HG191211-5			1	✓	1	
4	WG488184PBS	NONE			1	✓	1	
5	L56331-01	STSB32_0.5-3			1	✓	1	
6	L56331-02	STSB32_6-15			1	✓	1	
7	L56331-03	STSB34_0.5-3			1	✓	1	
8	L56331-04	STSB34_6-15			1	✓	1	
9	L56331-05	STSB33_0.5-3			1	✓	1	
10	L56331-05MS2	HG191211-6			1	✓	1	
11	L56331-05MSD2	HG191211-6			1	✓	1	
12	L56331-06	STSB33_6-15			1	✓	1	
13	L56331-07	STSB33-FD_0.5-3			1	✓	1	
14	WG488654CCV1	HG191211-3			1	✓	1	
15	WG488654CCB1	NONE			1	✓	1	
16	L56331-08	STSB35_0.5-3			1	✓	1	
17	L56331-09	STSB35_6-15			1	✓	1	
18	WG488184LFB1	HG191211-6			1	✓	1	
20	WG488654CCV2	HG191211-3				✓		
21	WG488654CCB2	NONE			1	✓	1	

Report Comments:

Internal Comments

AREV: SLM 12/20/19
Initials, Date

SREV: MEH 12/23/19
Initials, Date

12/20/2019 5:52:42 PM 10120

L56331-2006231417

HG-MWMT

QC List Type: QC-CV-SM
QCListMatClass: SOLID
Bench Sheet List: I-CV-MWMT
QC Ref: MA-HG-D-846
Group ID: MA-G-HG-MWMT
Method Ref: M7470A
SOP Ref: SOPII005

WG488654

ACZ Laboratories, Inc

Instrument ID: M7600
Analyst:
ACZ Dept: 33
Create Date: 12/20/2019 12:54
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS2	ICP Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184LFB1	ICP LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/20/2019 5:52:42 PM 10120

ACZ Laboratories, Inc.
HG-CVAA/SE-HY DATA REVIEW CHECKLIST

Data Reviewer: SLM
Date: 12/20/19

Approved: JEH
Date: 12/23/19

Work Group: 488654
Sample Type: HGMWMT
Analysis Date: 12/20/19
Analyst: SLM

	Yes	No	N/A
1.) Does the instrument calibration meet the specified method criteria? ($r \geq 0.995$)	✓		
2.) Was the low calibration standard dropped? If Yes, notify PM of change to PQL.		✓	
3.) Are all of the QC critera listed in LIMS within the acceptance limits?	✓		
4.) Are "H" flags for missed hold time appropriate?			✓
5.) Are all samples requiring re-analysis / re-digestion at REDO / REDX status?			✓
6.) Are all dilution factors correctly calculated and uploaded? (Soil, Sludge, Water)			✓
7.) Is any sample prepped / analyzed on dilution appropriately "D" qualified (except o-cal)?			✓
8.) Are dilutions for o-cals in the appropriate range? (explain if "B" or "U" is reported)			✓
9.) Is the correct sub-sample type entered on the bench sheet (if different than SOP)?			✓
10.) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
11.) Is a current standard/reagent sheet attached to the workgroup?	✓		
12.) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? Yes Cal WG#: 488445 Digest Time In: 1509

Digest Date: 12/20/19 Digest Temp: 87°C Digest Time Out: 1709

Disposable Vessel Lot #*: ——

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action

Comments:

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

FRMII011.10.16.12

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488654

Date Reported: 23-Dec-19
Run ID: R1765520
Date Analyzed: 20-Dec-19
ICAL Workgroup: WG488445
Instrument ID: M7600

WG488654CCV1

Tag: Measured: 12/20/2019 5:52:57 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00485 ✓	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	97	1		%	++	0.0002	0.001			

WG488654CCB1

Tag: Measured: 12/20/2019 5:53:54 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND		1	U	mg/L	++	0.0002	0.001			

WG488654PQV

Tag: Measured: 12/20/2019 5:54:50 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.001	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	100 ✓	1		%	++	0.0002	0.001			

WG488184PBS

Tag: Measured: 12/20/2019 5:55:46 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND		1	U ✓	mg/L	++	0.0002	0.001			

WG488184LFB1

Tag: Measured: 12/20/2019 5:56:42 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00194 ✓	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	97	1		%	++	0.0002	0.001			

L56331-01

Tag: Measured: 12/20/2019 5:57:39 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-MWMT	.0004	1	B	mg/L	++	0.0002	0.001		Q6	

L56331-02

Tag: Measured: 12/20/2019 5:58:35 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-MWMT		1	U	mg/L	++	0.0002	0.001		Q6	

L56331-03

Tag: Measured: 12/20/2019 5:59:32 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-MWMT		1	U	mg/L	++	0.0002	0.001		Q6	

L56331-04

Tag: Measured: 12/20/2019 6:00:29 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-MWMT		1	U	mg/L	++	0.0002	0.001		Q6	

L56331-05

Tag: Measured: 12/20/2019 6:01:26 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-MWMT		1	U	mg/L	++	0.0002	0.001		Q6	

L56331-05MS2

Tag: Measured: 12/20/2019 6:02:23 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00187 ✓	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	93	1		%	++	0.0002	0.001			

L56331-05MSD2

Tag: Measured: 12/20/2019 6:03:21 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00194	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	97 ✓	1		%	++	0.0002	0.001			
SREV	MERCURY	RPD	4	1		%	++	0.0002	0.001			

WG488654CCV2

Tag: Measured: 12/20/2019 6:04:17 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00476	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	95 ✓	1		%	++	0.0002	0.001			

WG488654CCB2

Tag: Measured: 12/20/2019 6:05:13 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND		1	U ✓	mg/L	++	0.0002	0.001			

L56331-06

Tag: Measured: 12/20/2019 6:06:09 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-MWMT		1	U	mg/L	++	0.0002	0.001		Q6	

L56331-07

Tag: Measured: 12/20/2019 6:07:05 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-MWMT		1	U	mg/L	++	0.0002	0.001		Q6	

L56331-08

Tag: Measured: 12/20/2019 6:08:01 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-MWMT		1	U	mg/L	++	0.0002	0.001		Q6	

L56331-09

Tag: Measured: 12/20/2019 6:08:58 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	HG-MWMT	.0007	1	B	mg/L	++	0.0002	0.001		Q6	

WG488654CCV3

Tag: Measured: 12/20/2019 6:09:54 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND	0.00472 ✓	1		mg/L	++	0.0002	0.001			
SREV	MERCURY	REC	94	1		%	++	0.0002	0.001			

WG488654CCB3

Tag:

Measured: 12/20/2019 6:10:50 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	MERCURY	FOUND		1	U ✓	mg/L	++	0.0002	0.001			

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Metals Analysis

WG488654 **HG-MWMT**

Sample	Date	SCN	Hg
WG488654CCV1	12/20/19 17:52	HG191211-3	X
WG488654CCB1	12/20/19 17:53		X
WG488654PQV	12/20/19 17:54	HG191211-5	X
WG488184PBS	12/20/19 17:55		X
WG488184LFB1	12/20/19 17:56	HG191211-6	X
L56331-01	12/20/19 17:57		X
L56331-02	12/20/19 17:58		X
L56331-03	12/20/19 17:59		X
L56331-04	12/20/19 18:00		X
L56331-05	12/20/19 18:01		X
L56331-05MS2	12/20/19 18:02	HG191211-6	X
L56331-05MSD2	12/20/19 18:03	HG191211-6	X
WG488654CCV2	12/20/19 18:04	HG191211-3	X
WG488654CCB2	12/20/19 18:05		X
L56331-06	12/20/19 18:06		X
L56331-07	12/20/19 18:07		X
L56331-08	12/20/19 18:08		X
L56331-09	12/20/19 18:08		X
WG488654CCV3	12/20/19 18:09	HG191211-3	X
WG488654CCB3	12/20/19 18:10		X

Cyanide MWMT

QC List Type: QC-RFA-CN
QCListMatClass: LIQUID
Bench Sheet List:
QC Ref: WC-RFA-T-SOL
Group ID: WC-G-RFA-CN-WAD-MWM
Method Ref: 335.4
SOP Ref: SOPWC058

WG489180

ACZ Laboratories, Inc

Instrument ID: FIA1
Analyst: WTC
ACZ Dept: 37
Create Date: 01/01/2020 14:55
Start Date/Time:
End Date/Time:

L56331-2006231417

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	CN WAD MWMT	Dilution
1	WG489180ICV	WI191230-10			1	☑	1
2	WG489180ICB	NONE			1	☑	1
3	WG489180LFB	WI191230-7			1	☑	1
4	WG488184PBS	NONE			1	☑	1
5	L56331-01	STSB32_0.5-3			1	☑	~~1~~ 0.5
6	L56331-01DUP	NONE			1	☑	~~1~~
7	L56331-02	STSB32_6-15			1	☑	~~1~~
8	L56331-02LFM	WI191230-7			1	☑	~~1~~
9	L56331-03	STSB34_0.5-3			1	☑	~~1~~
10	L56331-04	STSB34_6-15			1	☑	~~1~~
11	L56331-05	STSB33_0.5-3			1	☑	~~1~~
12	L56331-06	STSB33_6-15			1	☑	~~1~~
13	WG489180CCV1	WI191230-5			1	☑	1
14	WG489180CCB1	NONE			1	☑	1
15	L56331-07	STSB33-FD_0.5-3			1	☑	~~1~~ 0.5
16	L56331-08	STSB35_0.5-3			1	☑	~~1~~
17	L56331-09	STSB35_6-15			1	☑	~~1~~
18	WG489180CCV2	WI191230-5			1	☑	1
19	WG489180CCB2	NONE			1	☑	1

WTC 1/1/20

Report Comments: LRB added at instrument
Incorrect dilutions entered @ prep Corrected @ instrument

Internal Comments

AREV: WTC 1/2/20
Initials, Date

SREV: KRH 1-2-20
Initials, Date

1/1/2020 2:56:19 PM 10120

ACZ Laboratories, Inc.
WET CHEM INSTRUMENT DATA REVIEW CHECKLIST

AREV: WTC
Date: 1/2/20

SREV: KRH
Date: 1-2-20

Instrument ID: FIA1

Work Group: 489180
Sample Type: CN WAD MWMT
Analysis Date: 1/1/20
Analyst: WTC

	Yes	No	N/A
1) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
2) Is a current standard/reagent sheet attached to the workgroup?	✓		
3) If applicable, was sample pH at log-in receipt and/or analysis within method criteria?			✓
4) Does the instrument calibration meet the specified method criteria? (r or $r^2 \geq 0.995$)	✓		
5) Are all of the QC critera listed in LIMS within specified limits?		✓	
6) If applicable, was a passing PQV indcluded in the WG?			✓
7) Are all dilution factors correctly calculated and uploaded? (Soil, Sludges, Water)	✓		
8) Are dilutions in the appropriate range? (explain if "B" or "U" reported for sample)			✓
9) Was sample-analysis completed within the holding time?	✓	KRH 1-2-20 OK @ SREV	
10) Are all applicable qualifiers transferred from bench sheet to LIMS?			✓
11) **For soil/sludge analyses:** Was a hand calculated % recovery performed for LFM/MS/AS?			✓
12) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? —

Calibration WG: —

Prep WG#: 489178

Disposable Vessel Lot#*: —

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
331-02/LFM	Low spike recovery	M2
331-01/DUP	<10X MDL	R4
331-01,-02,-03,-04	Sx's analyzed day of hold. "H" qual	H1 See case narrative

Comments:

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

Cyanide MWMT

QC List Type: QC-RFA-CN
QCListMatClass: LIQUID
Bench Sheet List:
QC Ref: WC-RFA-T-SOL
Group ID: WC-G-RFA-CN-WAD-MWM
Method Ref: 335.4
SOP Ref: SOPWC058

WG489180

ACZ Laboratories, Inc

Instrument ID: FIA1
Analyst:
ACZ Dept: 37
Create Date: 01/01/2020 14:55
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/1/2020 2:56:19 PM 10120

WG489180

Qual Report

Samplenum	Collectdate	Receivedate	Measuredate	Holddate	Aprox Login Date	Aprox Login Review Date	Parm_Stored	Qual	Dept 20 Prep	Dept 30 Prep
L56331-01	11/25/19 13:40	12/09/19	01/01/20 15:18	01/01/20 13:30	12/13/19 9:51	12/10/2019	CYANIDE	UH	12/17/19 07:00	01/01/20 11:27
L56331-02	11/25/19 14:06	12/09/19	01/01/20 15:20	01/01/20 14:00	12/13/19 9:51	12/10/2019	CYANIDE	UH	12/17/19 08:35	01/01/20 11:46
L56331-03	11/25/19 15:05	12/09/19	01/01/20 15:21	01/01/20 13:34	12/13/19 9:51	12/10/2019	CYANIDE	UH	12/17/19 10:10	01/01/20 12:04
L56331-04	11/25/19 15:28	12/09/19	01/01/20 15:22	01/01/20 13:35	12/13/19 9:51	12/10/2019	CYANIDE	UH	12/17/19 11:46	01/01/20 12:13

L56331-2006231417

X-CN-WAD-MWMT

QC List Type: I-WCPREP-CN
QCListMatClass: LIQUID
Bench Sheet List: I-WCPREP-CN
QC Ref: WC PREP
Group ID: IP-G-WC-WAD-MWMT
Method Ref: SM4500 CN-I
SOP Ref: SOPWC072

WG489178

ACZ Laboratories, Inc

Instrument ID: WCDIG
Analyst: wtc
ACZ Dept: 30
Create Date: 01/01/2020 8:25
Start Date/Time: 01/01/2020 11:00
End Date/Time: 01/01/2020 13:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	CN WAD MWMT	pH Screen (units)	Sulfide Screen	Chlorine Screen	Sample Volume (mL)	Final Volume (mL)	Dilution	Comments
1	WG489178LRB	NONE	mwmt		01/01/20 11:00	☑	12	-	-	50	25	1	
2	WG489178LFB	WI191230-7	mwmt		01/01/20 11:09	☑	12	-	-	50	25	1	
3	WG488184PBS	NONE	mwmt		01/01/20 11:18	☑	14	-	-	50	25	1	
4	L56331-01	STSB32_0.5-3	mwmt		01/01/20 11:27	☑	14	-	-	50	25	1	
5	L56331-01DUP	NONE	mwmt		01/01/20 11:36	☑	14	-	-	50	25	1	
6	L56331-02	STSB32_6-15	mwmt		01/01/20 11:46	☑	14	-	-	50	25	1	
7	L56331-02LFM	WI191230-7	mwmt		01/01/20 11:55	☑	14	-	-	50	25	1	
8	L56331-03	STSB34_0.5-3	mwmt		01/01/20 12:04	☑	14	-	-	50	25	1	
9	L56331-04	STSB34_6-15	mwmt		01/01/20 12:13	☑	14	-	-	50	25	1	
10	L56331-05	STSB33_0.5-3	mwmt		01/01/20 12:23	☑	14	-	-	50	25	1	
11	L56331-06	STSB33_6-15	mwmt		01/01/20 12:32	☑	14	-	-	50	25	1	
12	L56331-07	STSB33-FD_0.5-3	mwmt		01/01/20 12:41	☑	14	-	-	50	25	1	
13	L56331-08	STSB35_0.5-3	mwmt		01/01/20 12:50	☑	14	-	-	50	25	1	
14	L56331-09	STSB35_6-15	mwmt		01/01/20 13:00	☑	14	-	-	50	25	1	

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/1/2020 1:59:25 PM 10120

X-CN-WAD-MWMT

QC List Type: I-WCPREP-CN
QCListMatClass: LIQUID
Bench Sheet List: I-WCPREP-CN
QC Ref: WC PREP
Group ID: IP-G-WC-WAD-MWMT
Method Ref: SM4500 CN-I
SOP Ref: SOPWC072

WG489178

ACZ Laboratories, Inc

Instrument ID: WCDIG
Analyst: wtc
ACZ Dept: 30
Create Date: 01/01/2020 8:25
Start Date/Time: 01/01/2020 11:00
End Date/Time: 01/01/2020 13:00

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/1/2020 1:59:25 PM 10120

ACZ LABORATORIES, INC
2773 Downhill Drive
Steamboat Springs, CO 80487

WET CHEMISTRY INSTRUMENT
REAGENTS INFORMATION

Instrument: LACHAT

Parameter: Cyanide Instrument

Instrument Reagents

	PCN/SCN	Prep By:	Expiration:
1) Phosphate Buffer	PCN58272	mss2	1/11/2020
2) 0.25 N NaOH	PCN58925	KRH	11/25/2020
3) Chloramine T *made daily	PCN59137	wtc	1/1/2020
4) Pyridine-Barbituric Acid Reagent *made monthly	WIR200101-2	wtc	02/01/20

CN Working Standards Prepared Fresh Daily wtc

Author: wcins

Date : 1/1/2020

Channel 1 - Set: 3 / 3

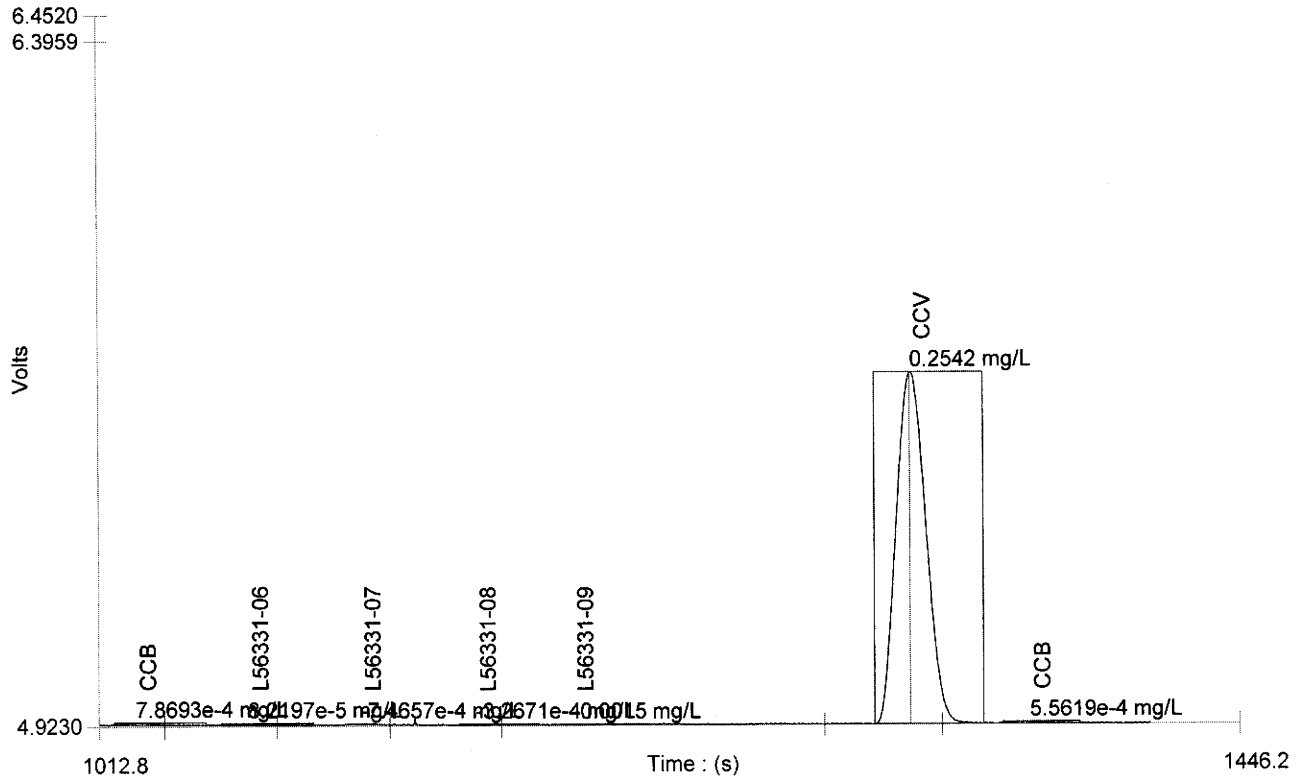
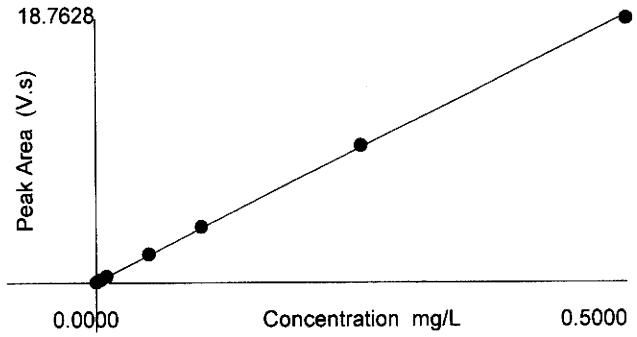


Table : 1 (CN)

	Known Conc. (mg/L)	Rep.	Peak Area (V.s)	Peak Height (V)	% RSD	% Residual	Det. Conc (mg/L)	Detection Date	Detection Time
1	0.5000	1	18.7628	1.4536	0.0	1.5	0.4922	1/1/2020	3:06:04 PM
2	0.2500	1	9.6770	0.7477	0.0	-1.4	0.2533	1/1/2020	3:06:56 PM
3	0.1000	1	3.9250	0.3038	0.0	-2.1	0.1021	1/1/2020	3:07:48 PM
4	0.0500	1	2.0110	0.1541	0.0	-3.5	0.0518	1/1/2020	3:08:41 PM
5	0.0100	1	0.4463	0.0339	0.0	-5.6	0.0106	1/1/2020	3:09:34 PM
6	0.0040	1	0.1838	0.0142	0.0	5.5	0.0037	1/1/2020	3:10:28 PM
7	0.0000	1	0.0353	0.0026			-1.8300e-4	1/1/2020	3:11:22 PM

Figure : 1 (CN)



Area = 38.0211 * Conc + 0.0424

Conc = 0.0263 * Area - 0.0011

Correlation Coefficient (r) = 0.99998

Weighting : 1/x

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG489180

Date Reported: 02-Jan-20
Run ID: R1766286
Date Analyzed: 01-Jan-20
ICAL Workgroup:
Instrument ID: FIA1

WG489180ICV

Tag: Measured: 1/1/2020 3:13:53 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND	0.2894 ✓	1		mg/L	++	0.003	0.01			
SREV	CYANIDE	REC	96	1		%	++	0.003	0.01			

WG489180ICB

Tag: Measured: 1/1/2020 3:14:47 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND		1	U ✓	mg/L	++	0.003	0.01			

WG489180LRB

Tag: Measured: 1/1/2020 3:15:41 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND		0.5	U ✓	mg/L	++	0.003	0.01			

WG489180LFB

Tag: Measured: 1/1/2020 3:16:34 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND	0.1909 ✓	0.5		mg/L	++	0.003	0.01			
SREV	CYANIDE	REC	95	0.5		%	++	0.003	0.01			

WG488184PBS

Tag: Measured: 1/1/2020 3:17:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND		0.5	U ✓	mg/L	++	0.003	0.01			

L56331-01

Tag: Measured: 1/1/2020 3:18:20 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	.D-MWMT		0.5	UH	mg/L	++	0.003	0.01		H1 M2 Q6 RA TB	

L56331-01DUP

Tag: Measured: 1/1/2020 3:19:13 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND		0.5	U ✓	mg/L	++	0.003	0.01			
SREV	CYANIDE	RPD	0	0.5		%	++	0.003	0.01		RA	

L56331-02

Tag: Measured: 1/1/2020 3:20:06 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	.D-MWMT		0.5	UH	mg/L	++	0.003	0.01		H1 M2 Q6 RA TB	

L56331-02LFM

Tag: Measured: 1/1/2020 3:20:58 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND	0.1505 ✓	0.5		mg/L	++	0.003	0.01			
SREV	CYANIDE	REC 75-125	75	0.5		%	ALRT	0.003	0.01		M2	

L56331-03 Tag: Measured: 1/1/2020 3:21:51 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	,D-MWMT		0.5	UH	mg/L	++	0.003	0.01		H1 M2 Q6 RA TB	

L56331-04 Tag: Measured: 1/1/2020 3:22:43 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	,D-MWMT		0.5	UH	mg/L	++	0.003	0.01		H1 M2 Q6 RA TB	

L56331-05 Tag: Measured: 1/1/2020 3:23:35 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	,D-MWMT		0.5	U	mg/L	++	0.003	0.01		M2 Q6 RA TB	

WG489180CCV1 Tag: Measured: 1/1/2020 3:24:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND	0.2513	1		mg/L	++	0.003	0.01			
SREV	CYANIDE	REC	101	1		%	++	0.003	0.01			

WG489180CCB1 Tag: Measured: 1/1/2020 3:25:21 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND		1	U	mg/L	++	0.003	0.01			

L56331-06 Tag: Measured: 1/1/2020 3:26:14 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	,D-MWMT		0.5	U	mg/L	++	0.003	0.01		M2 Q6 RA TB	

L56331-07 Tag: Measured: 1/1/2020 3:27:05 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	,D-MWMT		0.5	U	mg/L	++	0.003	0.01		M2 Q6 RA TB	

L56331-08 Tag: Measured: 1/1/2020 3:27:57 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	,D-MWMT		0.5	U	mg/L	++	0.003	0.01		M2 Q6 RA TB	

L56331-09 Tag: Measured: 1/1/2020 3:28:49 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	,D-MWMT		0.5	U	mg/L	++	0.003	0.01		M2 Q6 RA TB	

WG489180CCV2 Tag: Measured: 1/1/2020 3:31:18 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND	0.2542	1		mg/L	++	0.003	0.01			
SREV	CYANIDE	REC	102	1		%	++	0.003	0.01			

WG489180CCB2 Tag: Measured: 1/1/2020 3:32:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CYANIDE	FOUND		1	U	mg/L	++	0.003	0.01			

WG489180 Extended Qualifiers with Case Narratives

L56331-01 L56331-02 L56331-03 L56331-04	CYANIDE CYANIDE CYANIDE CYANIDE	H1	Samples were prepped and analyzed day of hold. Hold was caught as analysis was performed day of hold however, "H" qualifier was generated due to analysis being performed within hours of hold expiration.

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489180 **Cyanide MWMT**

Sample	Date	SCN	CYANIDE
WG489180ICV	01/01/20 15:13	WI191230-10	X
WG489180ICB	01/01/20 15:14		X
WG489180LRB	01/01/20 15:15		X
WG489180LFB	01/01/20 15:16	WI191230-7	X
WG488184PBS	01/01/20 15:17		X
L56331-01	01/01/20 15:18		X
L56331-01DUP	01/01/20 15:19		X
L56331-02	01/01/20 15:20		X
L56331-02LFM	01/01/20 15:20	WI191230-7	X
L56331-03	01/01/20 15:21		X
L56331-04	01/01/20 15:22		X
L56331-05	01/01/20 15:23		X
WG489180CCV1	01/01/20 15:24	WI191230-5	X
WG489180CCB1	01/01/20 15:25		X
L56331-06	01/01/20 15:26		X
L56331-08	01/01/20 15:27		X
L56331-07	01/01/20 15:27		X
L56331-09	01/01/20 15:28		X
WG489180CCV2	01/01/20 15:31	WI191230-5	X
WG489180CCB2	01/01/20 15:32		X

L56331-2006231417

CHLORIDE-SOLIDS

QC List Type: QC-RFA-CL
QCListMatClass: LIQUID
Bench Sheet List: I-RFA-CL-MWMT
QC Ref: WC-RFA-D-SOL
Group ID: WC-G-RFA-CL-MWMT
Method Ref: SM4500Cl-E
SOP Ref: SOPWC066

WG489256

ACZ Laboratories, Inc

Instrument ID: KONELAB
Analyst: TTG
ACZ Dept: 37
Create Date: 01/02/2020 15:12
Start Date/Time: 1-2-20 15:45
End Date/Time: 1-2-20 16:30

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	Analysis Date	CLMWMT	Chloride (mg/L)	Dilution	Comments
1	WG489256ICV	WI190501-1	W		1				✔		1	
2	WG489256ICB	NONE			1				✔		1	
3	WG489256LFB	WI190812-3			1				✔		1	
4	WG488184PBS	NONE			1				✔		1	
5	L56331-01	STSB32_0.5-3			1		4690*		✔		~~5~~ TTG 1-3-20	
6	L56331-02	STSB32_6-15			1		3320*		✔		~~2~~	
7	L56331-02AS	WI190812-3			1				✔		~~2~~	
8	L56331-03	STSB34_0.5-3			1		2790*		✔		~~2~~	
9	L56331-04	STSB34_6-15			1		3840*		✔		~~2~~	
10	L56331-05	STSB33_0.5-3			1		3400*		✔		~~2~~	
11	L56331-06	STSB33_6-15			1		1110*		✔		1	
12	L56331-07	STSB33-FD_0.5-3			1		3340*		✔		~~2~~ TTG 1-3-20	
13	WG489256CCV1	WI190111-5			1				✔		1	
14	WG489256CCB1	NONE			1				✔		1	
15	L56331-08	STSB35_0.5-3			1		3350*		✔		~~2~~ TTG 1-3-20	
16	L56331-09	STSB35_6-15			1		4950*		✔		~~5~~	
17	L56452-01	LPT-1			1		704*		✔		1	
TTG 1-2-20 17	~~L56452-01MSD1~~	~~MS191119-5~~			~~1~~				~~✔~~		~~1~~	
17	WG488413PBS	NONE	W		1				✔		1	
18	WG488496PBS	NONE			1				✔		1	
19	L56453-01	STSB05_0.5-3			1		4210		✔		~~5~~ TTG 1-3-20	
19	L56453-02	STSB05_6-15			1		3620		✔		~~2~~	

Report Comments: Added L56331-01 DUP into WG at bench 1-2-20

Internal Comments: L56452-01 MSD1 deleted at bench 1-2-20-TTG

AREV: TTG 1-3-20
Initials, Date

SREV: KRH ~~1-3-20~~ 1-6-20 KRH 1-6-20
Initials, Date

1/2/2020 3:14:50 PM 123119

ACZ Laboratories, Inc.
WET CHEM INSTRUMENT DATA REVIEW CHECKLIST

AREV: TTR
Date: 1-3-20

SREV: KRH
Date: ~~1-3-20~~ 1-6-20 KRH 1-6-20

Instrument ID Icumelu6

Work Group: 488256
Sample Type: CL-mvmt
Analysis Date: 1-2-20
Analyst: TTR

	Yes	No	N/A
1) Are all errors properly corrected (i.e. single-line cross out, dated & initialed)?	X		
2) Is a current standard/reagent sheet attached to the workgroup?	X		
3) If applicable, was sample pH at log-in receipt and/or analysis within method criteria?			X
4) Does the instrument calibration meet the specified method criteria? (r or $r^2 \geq 0.995$)	X		
5) Are all of the QC criteria listed in LIMS within specified limits?	X		
6) If applicable, was a passing PQV included in the WG?			X
7) Are all dilution factors correctly calculated and uploaded? (Soil, Sludge, Water)	X		
8) Are dilutions in the appropriate range? (explain if "B" or "U" reported for sample)	X		
9) Was sample-analysis completed within the holding time?		X	
10) Are all applicable qualifiers transferred from bench sheet to LIMS?			X
11) **For soil/sludge analyses:** Was a hand calculated % recovery performed for LFM/MS/AS?			X
12) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? NO Calibration WG: ——

Prep WG#: 488184/488413/488496 Disposable Vessel Lot#*: 05-527-45

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
~~453-1-16~~	~~Sample analyzed and received past hold date possible program error~~ KRH 1-3-20 ~~POST SOILS EXTRACTION HOLD TIME WAS MET~~	~~PB FLAG~~ KRH 1-6-20
453-1→6	"H" QUALS GENERATED DUE TO INCORRECTLY ENTERED DATE @ EXTRACTION	ALL SAMPLES WERE ANALYZED W/IN HOLD. "H" QUALS REMOVED @ SREV KRH 1-6-20

Comments:

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

L56331-2006231417

CHLORIDE-SOLIDS

QC List Type: QC-RFA-CL
QCListMatClass: LIQUID
Bench Sheet List: I-RFA-CL-MWMT
QC Ref: WC-RFA-D-SOL
Group ID: WC-G-RFA-CL-MWMT
Method Ref: SM4500Cl-E
SOP Ref: SOPWC066

WG489256

ACZ Laboratories, Inc

Instrument ID: KONELAB
Analyst:
ACZ Dept: 37
Create Date: 01/02/2020 15:12
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	Analysis Date	CLMWMT	Chloride (mg/L)	Dilution	Comments
19	L56453-03	STSB05_45-55	W		1		874		✔		1	
20	L56453-04	STSB05_66-71			1		2190		✔		1 ~~2~~ 1-3-20	
21	L56453-05	STSB05_76-81			1		1830		✔		1	
22	L56453-06	STSB06_0.5-3			1		1780		✔		1	
23	WG489256CCV2	WI190812-3			1				✔		1	
24	WG489256CCB2	NONE			1				✔		1	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56452-01	SJ(2) || quarantined
L56452-01MSD1	ICPMS Spike
L56453-01	BUCKET ||
L56453-02	BUCKET ||
L56453-03	BUCKET ||
L56453-04	BUCKET ||
L56453-05	BUCKET ||
L56453-06	BUCKET ||

Report Comments:

Internal Comments

AREV:
Initials, Date

SREV:
Initials, Date

1/2/2020 3:14:51 PM 123119

WG489256

Qual Report

Samplenum	Collectdate	Receivedate	Measuredate	Holddate	Aprox Login Date	Aprox Login Review Date	Parm_Stored	Qual	Dept 20 Prep
L56453-02	12/04/19 14:00	12/13/19	01/02/20 16:39	01/16/02 7:00	12/14/19 8:26	12/16/2019	CHLORIDE	H	12/19/01 07:00
L56453-01	12/04/19 12:54	12/13/19	01/02/20 16:39	01/16/02 7:00	12/14/19 8:26	12/16/2019	CHLORIDE	H	12/19/01 07:00
L56453-03	12/04/19 15:10	12/13/19	01/02/20 16:39	01/16/02 7:00	12/14/19 8:26	12/16/2019	CHLORIDE	H	12/19/01 07:00
L56453-04	12/04/19 15:44	12/13/19	01/02/20 16:39	01/16/02 7:00	12/14/19 8:26	12/16/2019	CHLORIDE	H	12/19/01 07:00
L56453-05	12/04/19 16:00	12/13/19	01/02/20 16:40	01/16/02 7:00	12/14/19 8:26	12/16/2019	CHLORIDE	H	12/19/01 07:00
L56453-06	12/05/19 10:57	12/13/19	01/02/20 16:40	01/16/02 7:00	12/14/19 8:26	12/16/2019	CHLORIDE	UH	12/19/01 07:00

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 17:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE															
2	WG488184CSTD2	NONE															
3	WG488184CSTD3	NONE															
4	WG488184ICV	PCN58503															
5	WG488184PBS	NONE	AS REC		12/18/19 17:59		4.89		6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
6	L56331-01	STSB32_0.5-3	AS REC		12/17/19 7:00	0	4.89	23	4.16	4.2	5000	5017	11.3	12/17/19 8:45	12/18/19 13:30	28.7499999999418	19.3
7	L56331-02	STSB32_6-15	AS REC		12/17/19 8:35	0	4.89	23	5.33	5.48	5000	5000.7	20.37	12/17/19 8:45	12/18/19 14:00	29.25	19.9
8	L56331-03	STSB34_0.5-3	AS REC		12/17/19 10:10	0	4.89	23	4.94	4.9	5000	5003	10.64	12/17/19 8:45	12/18/19 13:34	28.8166666666511	19.9
9	L56331-04	STSB34_6-15	AS REC		12/17/19 11:46	0	4.89	23	5.26	5.38	5000	5003.4	19.98	12/17/19 8:45	12/18/19 13:35	28.8333333331975	19.8
10	L56331-05	STSB33_0.5-3	AS REC		12/17/19 13:21	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
11	L56331-05MS1	MS191119-5	AS REC		12/17/19 14:57	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
12	L56331-05MSD1	MS191119-5	AS REC		12/17/19 18:08	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
13	L56331-05MS2	II191204-3	AS REC		12/17/19 16:32	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
14	L56331-05MSD2	II191204-3	AS REC		12/17/19 19:43	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
15	WG488184CCV1	PCN58503	AS REC		12/18/19 3:40		4.06		4.07	4.08							19.8
16	L56331-06	STSB33_6-15	AS REC		12/17/19 21:19	0	4.89	23	7.07	7.34	5000	5009.7	21.6	12/17/19 8:45	12/18/19 16:00	31.2499999998836	19.2
17	L56331-07	STSB33-FD_0.5-3	AS REC		12/17/19 22:54	0	4.89	23	4.28	4.34	5000	5000.3	16.22	12/17/19 8:45	12/18/19 14:25	29.6666666666279	19.2
18	L56331-08	STSB35_0.5-3	AS REC		12/18/19 0:29	0	4.89	23	4.25	4.21	5000	5000	11.69	12/17/19 8:45	12/18/19 14:15	29.4999999999418	19.2
19	L56331-09	STSB35_6-15	AS REC		12/18/19 2:05	0	4.89	23	3.87	3.8	5000	5004.4	11.16	12/17/19 8:45	12/18/19 14:15	29.4999999999418	19.4
20	WG488184ICV1		AS REC		12/18/19 13:13		3.97		3.97	3.97							20.1
20	WG488184LFB1	II191204-3	AS REC		12/18/19 14:49	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
21	WG488184LFB2	MS191119-5	AS REC		12/18/19 16:24	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/2/2020 3:53:22 PM 10120

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 17:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
22	WG488184CCV2	PCN58503	AS REC		12/18/19 5:16		4.03		4.07	4.02							19.7

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MS2	ICP Spike
L56331-05MSD1	ICPMS Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184CCV1	pH QC
WG488184CCV2	pH QC
WG488184CSTD1	pH QC
WG488184CSTD2	pH QC
WG488184CSTD3	pH QC
WG488184ICV	pH QC
WG488184ICV1	WG488184ICV1
WG488184LFB1	ICP LFB
WG488184LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/2/2020 3:53:22 PM 10120

ACZ LABORATORIES, INC
2773 Downhill Drive
Steamboat Springs, CO 80487

WET CHEMISTRY INSTRUMENT REAGENTS INFORMATION

Instrument: Konelab

Parameter: Chloride

Working Standards Preparation: See SOP

Instrument Reagents	SCN	**Prep By:**	**Expiration Date:**
1) Combined Color Reagent	WIR191226-4	ttg	1/26/2020

*All Standards and Reagents prepared according to SOP.

Calibration results AquaKem 6.5 Page: 1

ACZ Laboratory
Konelab User

02.01.2020 15:38

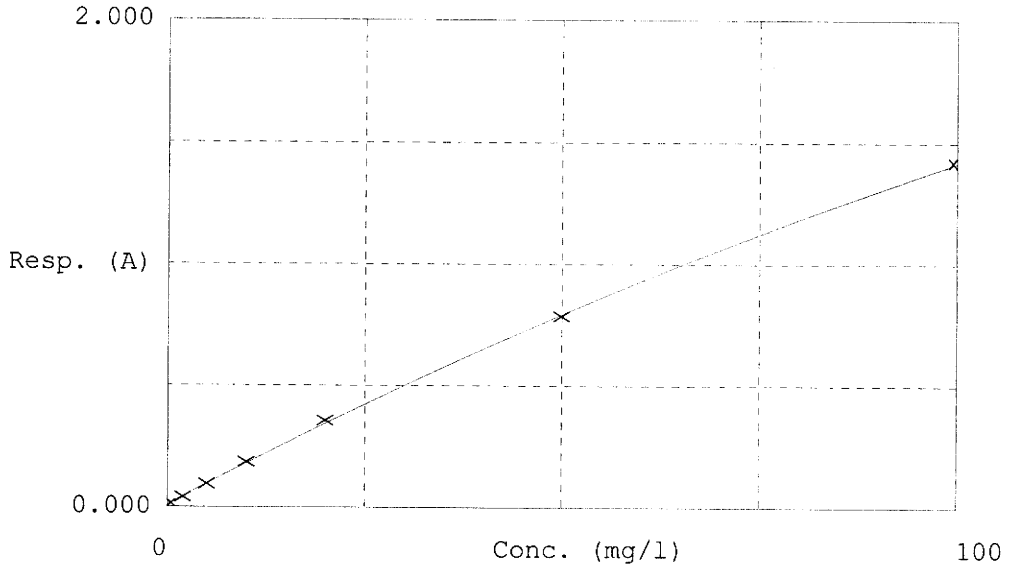
Test Chloride

Accepted 02.01.2020 15:38

Resp. = A * Conc. ^ 2 + B * Conc. + C
A = 0
B = 0.017
C = 0.011

Coeff. of det. 0.999848

Errors



	Calibrator	Response	Calc. con.	Conc.	Errors
1	Cl-0	0.008	-0.128278	0.000000	
2	CL-100	0.040	1.728319	2.000000	
3	CL-100	0.094	4.870004	5.000000	
4	CL-100	0.184	10.251524	10.000000	
5	CL-100	0.354	20.714132	20.000000	
6	CL-100	0.785	49.430805	50.000000	
7	CL-100	1.418	100.139297	100.000000	
8	CL-ICB(control)	0.010	-0.013639	0.000000	
9	CL-ICV(control)	0.832	52.791832	55.000000	

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG489256

Date Reported: 06-Jan-20
Run ID: R1766496
Date Analyzed: 02-Jan-20
ICAL Workgroup:
Instrument ID: KONELAB

WG489256ICB

Tag: Measured: 1/2/2020 3:38:34 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND		1	U ✓	mg/L	++	0.5	2			

WG489256ICV

Tag: Measured: 1/2/2020 3:38:35 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND	52.79 ✓	1		mg/L	++	0.5	2			
SREV	CHLORIDE	REC	96	1		%	++	0.5	2			

WG489256CCV1

Tag: Measured: 1/2/2020 4:37:28 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND	48.82 ✓	1		mg/L	++	0.5	2			
SREV	CHLORIDE	REC	98	1		%	++	0.5	2			

WG489256CCB1

Tag: Measured: 1/2/2020 4:37:29 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND		1 ✓	U	mg/L	++	0.5	2			

WG489256LFB

Tag: Measured: 1/2/2020 4:37:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND	31.51 ✓	1		mg/L	++	0.5	2			
SREV	CHLORIDE	REC	105	1		%	++	0.5	2			

WG488184PBS

Tag: Measured: 1/2/2020 4:37:31 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND		1	U ✓	mg/L	++	0.5	2			

L56331-01

Tag: Measured: 1/2/2020 4:37:32 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	9.9	1		mg/L	++	0.5	2		HD TB	

L56331-01DUP

Tag: Measured: 1/2/2020 4:37:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND	9.94	1		mg/L	++	0.5	2			
SREV	CHLORIDE	RPD	0 ✓	1		%	++	0.5	2			

L56331-02

Tag: Measured: 1/2/2020 4:37:34 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	17.1	1		mg/L	++	0.5	2		HD TB	

L56331-02AS

Tag: Measured: 1/2/2020 4:37:35 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND	44.35 ✓	1		mg/L	++	0.5	2			
SREV	CHLORIDE	REC	91	1		%	++	0.5	2			

L56331-03

Tag: Measured: 1/2/2020 4:37:36 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	1.8	1	B	mg/L	++	0.5	2		HD TB	

L56331-04

Tag: Measured: 1/2/2020 4:37:37 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	23.6	1		mg/L	++	0.5	2		HD TB	

L56331-05

Tag: Measured: 1/2/2020 4:37:38 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	3.7	1		mg/L	++	0.5	2		HD TB	

L56331-06

Tag: Measured: 1/2/2020 4:37:39 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	12.6	1		mg/L	++	0.5	2		HD TB	

WG489256CCV2

Tag: Measured: 1/2/2020 4:39:25 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND	48.93	1		mg/L	++	0.5	2			
SREV	CHLORIDE	REC	98 ✓	1		%	++	0.5	2			

WG489256CCB2

Tag: Measured: 1/2/2020 4:39:26 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND		1	U ✓	mg/L	++	0.5	2			

L56331-07

Tag: Measured: 1/2/2020 4:39:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	4.3	1		mg/L	++	0.5	2		HD TB	

L56331-08

Tag: Measured: 1/2/2020 4:39:28 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	3.8	1		mg/L	++	0.5	2		HD TB	

L56331-09

Tag: Measured: 1/2/2020 4:39:29 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	6.7	1		mg/L	++	0.5	2		HD TB	

WG488413PBS

Tag: Measured: 1/2/2020 4:39:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND		1	U	mg/L	++	0.5	2			

WG488496PBS

Tag: Measured: 1/2/2020 4:39:32 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND		1	U	mg/L	++	0.5	2			

L56453-02

Tag: Measured: 1/2/2020 4:39:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	7.1	1		mg/L	++	0.5	2		HD TA TB	

L56453-01

Tag: Measured: 1/2/2020 4:39:34 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	7.0	1		mg/L	++	0.5	2		HD TA TB	

L56453-03

Tag: Measured: 1/2/2020 4:39:35 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	49.9	1		mg/L	++	0.5	2		HD TA TB	

L56453-04

Tag: Measured: 1/2/2020 4:39:36 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	7.7	1		mg/L	++	0.5	2		HD TA TB	

WG489256CCV3

Tag: Measured: 1/2/2020 4:40:10 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND	48.39 ✓	1		mg/L	++	0.5	2			
SREV	CHLORIDE	REC	97	1		%	++	0.5	2			

WG489256CCB3

Tag: Measured: 1/2/2020 4:40:11 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND		1	U ✓	mg/L	++	0.5	2			

L56453-05

Tag: Measured: 1/2/2020 4:40:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	8.5	1		mg/L	++	0.5	2		HD TA TB	

L56453-06

Tag: Measured: 1/2/2020 4:40:13 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT		1	U	mg/L	++	0.5	2		HD TA TB	

WG489256CCV4

Tag: Measured: 1/2/2020 4:40:44 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND	48.65	1		mg/L	++	0.5	2			
SREV	CHLORIDE	REC	97	1		%	++	0.5	2			

WG489256CCB4

Tag: Measured: 1/2/2020 4:40:45 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND		1	U	mg/L	++	0.5	2			

L56452-01

Tag: Measured: 1/2/2020 4:47:53 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	CL-MWMT	178	10		mg/L	++	5	20		HD TA TB	

WG489256CCV5

Tag: Measured: 1/2/2020 4:48:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND	48.95	1		mg/L	++	0.5	2			
SREV	CHLORIDE	REC	98	1		%	++	0.5	2			

WG489256CCB5

Tag: Measured: 1/2/2020 4:48:34 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORIDE	FOUND		1	U	mg/L	++	0.5	2			

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489256 **CHLORIDE-SOLIDS**

Sample	Date	SCN	CHLORIDE
WG489256ICV	01/02/20 15:38	WI190501-1	X
WG489256ICB	01/02/20 15:38		X
L56331-02	01/02/20 16:37		X
L56331-02AS	01/02/20 16:37	WI190812-3	X
L56331-03	01/02/20 16:37		X
WG488184PBS	01/02/20 16:37		X
L56331-04	01/02/20 16:37		X
L56331-01DUP	01/02/20 16:37		X
L56331-01	01/02/20 16:37		X
L56331-06	01/02/20 16:37		X
WG489256LFB	01/02/20 16:37	WI190812-3	X
WG489256CCB1	01/02/20 16:37		X
L56331-05	01/02/20 16:37		X
WG489256CCV1	01/02/20 16:37	WI190111-5	X
L56331-09	01/02/20 16:39		X
L56453-01	01/02/20 16:39		X
WG489256CCB2	01/02/20 16:39		X
L56331-08	01/02/20 16:39		X
L56453-02	01/02/20 16:39		X
L56453-03	01/02/20 16:39		X
L56453-04	01/02/20 16:39		X
WG488413PBS	01/02/20 16:39		X
WG489256CCV2	01/02/20 16:39	WI190111-5	X
WG488496PBS	01/02/20 16:39		X
L56331-07	01/02/20 16:39		X
L56453-06	01/02/20 16:40		X

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489256 **CHLORIDE-SOLIDS**

Sample	Date	SCN	CHLORIDE
WG489256CCV4	01/02/20 16:40	WI190111-5	X
WG489256CCV3	01/02/20 16:40	WI190111-5	X
WG489256CCB4	01/02/20 16:40		X
L56453-05	01/02/20 16:40		X
WG489256CCB3	01/02/20 16:40		X
L56452-01	01/02/20 16:47		X
WG489256CCV5	01/02/20 16:48	WI190111-5	X
WG489256CCB5	01/02/20 16:48		X

L56331-2006231417

N-NO3NO2-DISSOLVED

QC List Type: QC-RFA-NO3NO2
QCListMatClass: LIQUID
Bench Sheet List: I-RFA-NO3NO2
QC Ref: WC-INST-AQ-PQV
Group ID: WC-G-RFA-NO3NO2-D
Method Ref: M353.2
SOP Ref: SOPWC016

WG488593

ACZ Laboratories, Inc

Instrument ID: FIA2
Analyst: PJB
ACZ Dept: 37
Create Date: 12/19/2019 20:19
Start Date/Time: 12/19/19
End Date/Time: 12/20/19

SEQ	ACZ ID	Client ID	SubSX	Pri	NNO2	NNO3NO2	pH Screen (units)	Chlorine Screen	Nitrite (mg/L)	Nitrate/Nitrite (mg/L)	Dilution	Comments
1	WG488593ICV	WI191112-1			☑	☑					1	
2	WG488593ICB	NONE			☑	☑					1	
3	WG488593LFB1	WI191004-3			☑	☑					1	
4	L56541-01	RW191218401	W		☑	☑	7	–			+3 –	0-cal
5	L56541-01AS	WI191004-3			☑	☑	7	–			+3 –	
6	L56543-02	R2FD191218402			☑	☑	7	–			+10 –	
7	L56543-02DUP	NONE			☑	☑	7	–		PJB 12/19/19	+10 –	
8	L56543-03	R2DS191218403			☑	☑	7	–			+3 –	
9	L56544-01	FK191218401			☑	☑	7	–			+3 –	
10	L56544-02	FK191218402			☑	☑	7	–			1	
11	L56547-02	R3FD191218402			☑	☑	7	–			+15 –	0-cal
12	L56547-03	R3DS191218402			☑	☑	7	–			+4 –	
13	L56548-03	R1FD191218402			☑	☑	7	–			+20 –	
14	WG488593CCV1	WI191219-1			☑	☑					1	
15	WG488593CCB1	NONE			☑	☑					1	
16	L56548-04	R1DS191218402	W		☑	☑	7	–			1	
17	L56549-01	MW-01			☑	☑	7	–			1	f.lt
18	L56549-02	MW-03			☑	☑	7	–			1	
19	L56549-02AS	WI191004-3			☑	☑	7	–			1	
20	L56549-03	MW-04			☑	☑	7	–			1	
21	L56549-03DUP	NONE			☑	☑	7	–			1	
22	L56549-04	MW-07			☑	☑	7	–			1	

Report Comments: _____

Internal Comments _____

AREV: PJB 12/20/19
Initials, Date

SREV: KRH 12-20-19
Initials, Date

12/19/2019 8:19:44 PM 122719

ACZ Laboratories, Inc.
WET CHEM INSTRUMENT DATA REVIEW CHECKLIST

AREV: PJB
Date: 12/20/19

SREV: KRH
Date: 12-20-19

Instrument ID FIA2

Work Group: 488593
Sample Type: NO3 NO2-D
Analysis Date: 12/19/19
Analyst: PJB

	Yes	No	N/A
1) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	X		
2) Is a current standard/reagent sheet attached to the workgroup?	X		
3) If applicable, was sample pH at log-in receipt and/or analysis within method criteria?	X		
4) Does the instrument calibration meet the specified method criteria? (r or $r^2 \geq 0.995$)	X		
5) Are all of the QC critera listed in LIMS within specified limits?	X		
6) If applicable, was a passing PQV indcluded in the WG?			X
7) Are all dilution factors correctly calculated and uploaded? (Soil, Sludges, Water)	X		
8) Are dilutions in the appropriate range? (explain if "B" or "U" reported for sample)	X		
9) Was sample-analysis completed within the holding time?		X	
10) Are all applicable qualifiers transferred from bench sheet to LIMS?	X		
11) **For soil/sludge analyses:** Was a hand calculated % recovery performed for LFM/MS/AS?			X
12) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? not Calibration WG: –

Prep WG#: N19 Disposable Vessel Lot#*: 1265326

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
543-02/DUP	<10X MDL	RA
549-03/DUP		
552-01/DUP		
548-04	carry over	repeat w cnd
557-01		
549-01 → 06	small amount filtered	ZU
552-01		
557-01		
558-01		
559-01		
549-01, 06	needle missed cups	repeat w cnd
551-02 + repeat		

Comments: 549-06 (4X) not diluted in time repeat in R group

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

N-NO3NO2-DISSOLVED

QC List Type: QC-RFA-NO3NO2
QCListMatClass: LIQUID
Bench Sheet List: I-RFA-NO3NO2
QC Ref: WC-INST-AQ-PQV
Group ID: WC-G-RFA-NO3NO2-D
Method Ref: M353.2
SOP Ref: SOPWC016

WG488593

ACZ Laboratories, Inc

Instrument ID: FIA2
Analyst:
ACZ Dept: 37
Create Date: 12/19/2019 20:19
Start Date/Time:
End Date/Time:

L56331-2006231417

SEQ	ACZ ID	Client ID	SubSX	Pri	NO2	NO3NO2	pH Screen (units)	Chlorine Screen	Nitrite (mg/L)	Nitrate/Nitrite (mg/L)	Dilution	Comments
23	L56549-05	MW-09	W		☑	☑	8	–			13 –	f. ft o-cal
24	L56549-06	MW-10			☑	☑	7	–			14 –	
25	L56551-01	GW-2			☑	☑	7	–			1	
26	WG488593CCV2	WI191219-1			☑	☑					1	
27	WG488593CCB2	NONE			☑	☑					1	
28	L56551-02	GW-3	W		☑	☑	7	–			1	
29	L56551-03	GW-4			☑	☑	7	–		PSB 12/20/19	1	
30	L56551-04	CO-4			☑	☑	7	–			1	
31	L56551-05	CO-2			☑	☑	7	–			1	
32	WG488593LFB2	WI191004-3			☑	☑					1	
33	L56551-06	GW-5	W		☑	☑	7	–			1	
34	L56551-06AS	WI191004-3			☑	☑		–			1	
35	L56552-01	GROUNDWATER			☑	☑	7	–			14 –	f. ft. o-cal
36	L56552-01DUP	NONE			☑	☑	7	–			14 –	
37	L56557-01	SCLM-13A			☑	☑	7	–			1	
38	WG488593CCV3	WI191219-1			☑	☑					1	
39	WG488593CCB3	NONE			☑	☑					1	
40	L56558-01	RANDOM 1	W		☑	☑	8	–			1	f. ft
41	L56559-01	RANDOM 2			☑	☑	7	–			1	
42	WG488593CCV4	WI191219-1			☑	☑					1	
43	WG488593CCB4	NONE			☑	☑					1	

Report Comments:

Internal Comments

AREV:
Initials, Date

SREV:
Initials, Date

12/19/2019 8:19:47 PM 122719

N-NO3NO2-DISSOLVED

QC List Type: QC-RFA-NO3NO2
QCListMatClass: LIQUID
Bench Sheet List: I-RFA-NO3NO2
QC Ref: WC-INST-AQ-PQV
Group ID: WC-G-RFA-NO3NO2-D
Method Ref: M353.2
SOP Ref: SOPWC016

WG488593

ACZ Laboratories, Inc

Instrument ID: FIA2
Analyst:
ACZ Dept: 37
Create Date: 12/19/2019 20:19
Start Date/Time:
End Date/Time:

L56331-2006231417

Sample	Login Comments
L56541-01	P,U,W,RPC,Y ||
L56543-02	P,U,W,RPC,Y ||
L56543-03	P,U,W,RPC,Y ||
L56544-01	P,U,W,RPC,Y ||
L56544-02	P,U,W,RPC,Y ||
L56547-02	P,U,W,RPC,Y ||
L56547-03	P,U,W,RPC,Y ||
L56548-03	P,U,W,RPC,Y || P,U,W,RPC,Y ||
L56548-04	P,U,W,RPC,Y || P,U,W,RPC,Y ||
L56549-01	RedRad,GRADFA,P,U,WF,YG,VLP(3) (B2222317 HAS HEADSPACE, B2222403 HAS HEADSPACE, B2222404 HAS HEADSPACE) || RedRad,GRAD,P,U,WF,Y,VLP(3) (B2
L56549-02	RedRad,GRADFA,P,U,WF,YG,VLP(3) (B2222340 HAS HEADSPACE, B2222341 HAS HEADSPACE, B2222342 HAS HEADSPACE) || RedRad,GRADFA,P,U,WF,Y,VLP(3) (
L56549-03	RedRad,GRADFA,P,U,WF,YG,VLP(3) (B2222349 HAS HEADSPACE, B2222350 HAS HEADSPACE, B2222351 HAS HEADSPACE) || RedRad,GRADFA,P,U,WF,Y,VLP(3) (
L56549-04	RedRad,GRADFA,P,U,WF,YG,VLP(3) (B2222358 HAS HEADSPACE, B2222359 HAS HEADSPACE, B2222360 HAS HEADSPACE) || RedRad,GRADFA,P,U,WF,Y,VLP(3) (
L56549-05	RedRad,GRADFA,P,U,WF,YG,VLP(3) (B2222367 HAS HEADSPACE, B2222368 HAS HEADSPACE, B2222369 HAS HEADSPACE) || RedRad,GRADFA,P,U,WF,Y,VLP(3) (
L56549-06	RedRad,GRADFA,P,U,WF,YG,VLP(3) (B2222376 HAS HEADSPACE, B2222377 HAS HEADSPACE, B2222378 HAS HEADSPACE) || RedRad,GRADFA,P,U,WF,Y,VLP(3) (
L56551-01	U,W,RPC,G,Y,B ||
L56551-02	U,W,RPC,G,Y,B ||
L56551-03	U,W,RPC,G,Y,B ||
L56551-04	U,W,RPC,G,Y,B ||
L56551-05	U,W,RPC,G,Y,B ||
L56551-06	U,W,RPC,G,Y,B ||
L56552-01	P,U,WF,RPC,GPCFA,GPDPC,Y ||
L56557-01	U,WF,RPC,GFA,YG,VLUP(3) || U,WF,RPC,GFA,YG,VLUP(3) ||
L56558-01	U,WF,RPC,GFA,YG,VLUP(3) (B2222508 HAS HEADSPACE) ||
L56559-01	U,WF,RPC,GFA,YG,VLUP(3) ||

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/19/2019 8:19:47 PM 122719

ACZ LABORATORIES, INC
2773 Downhill Drive
Steamboat Springs, CO 80487

WET CHEMISTRY INSTRUMENT REAGENTS INFORMATION

Instrument: Lachat

Parameter: NO_3NO_2 Dissolved / Yellow / Sludge / KCL / MWMT / WE / 1312

Standard Preparation & Documentation

Instrument Reagents	SCN/PCN	Prepped by:	Expiration Date:
1) Stock Ammonium Chloride EDTA Buffer	WIR191214-1	pjb	12/14/2020
2) NO3NO2 and NO2 Color Reagent	WIR191210-5	pjb	3/10/2020
3) NH4OH (yellows and KCls only)	PCN52830		12/31/2019
4) HCl (yellows only)	PCN52674		10/31/2021

***Refer to SOP for standard and reagent prep.**

Author: wcins

Date : 12/20/2019

Channel 2 (NO2) - Set: 5 / 5

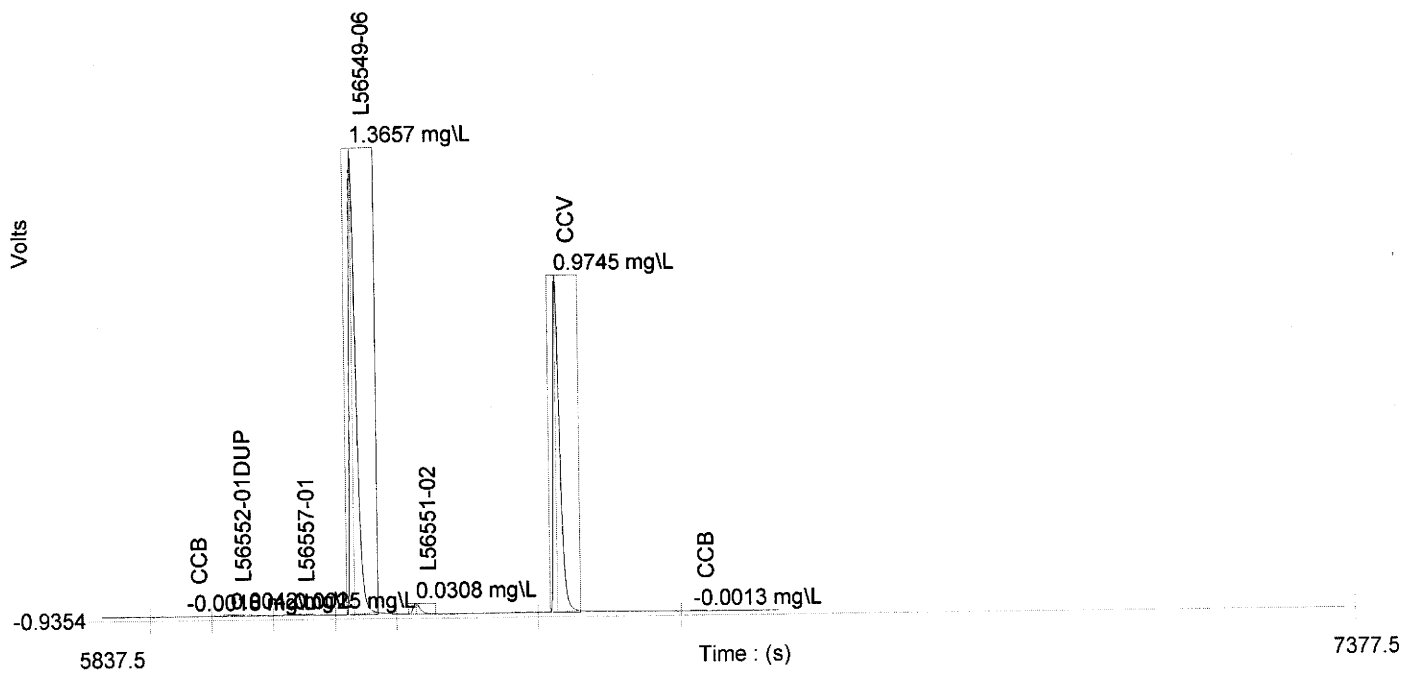


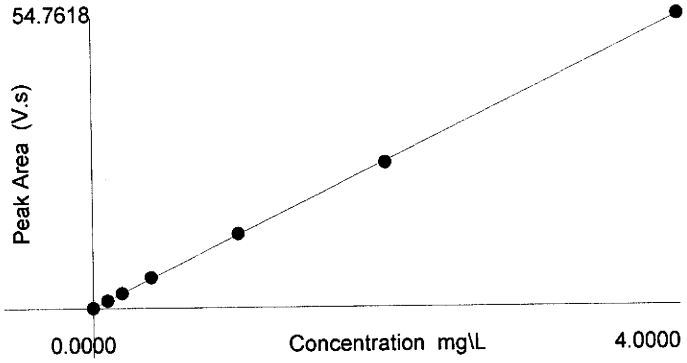
Table : 1 (NO3NO2)

	Known Conc. (mg\L)	Rep.	Peak Area (V.s)	Peak Height (V)	% RSD	% Residual	Det. Conc (mg\L)	Detection Date	Detection Time
1	4.0000	1	54.7618	3.4049	0.0	-0.2	4.0083	12/19/2019	10:25:51 PM
2	2.0000	1	27.0154	1.7121	0.0	1.2	1.9754	12/19/2019	10:27:06 PM
3	1.0000	1	13.8347	0.8881	0.0	-1.0	1.0097	12/19/2019	10:28:21 PM
4	0.4000	1	5.7114	0.3661	0.0	-3.6	0.4145	12/19/2019	10:29:36 PM
5	0.2000	1	2.7620	0.1783	0.0	0.8	0.1984	12/19/2019	10:30:52 PM
6	0.1000	1	1.3989	0.0904	0.0	1.5	0.0986	12/19/2019	10:32:09 PM
7	0.0000	1	-0.0129	-0.0015			-0.0049	12/19/2019	10:33:25 PM

Author: wcins

Date : 12/20/2019

Figure : 1 (NO3NO2)



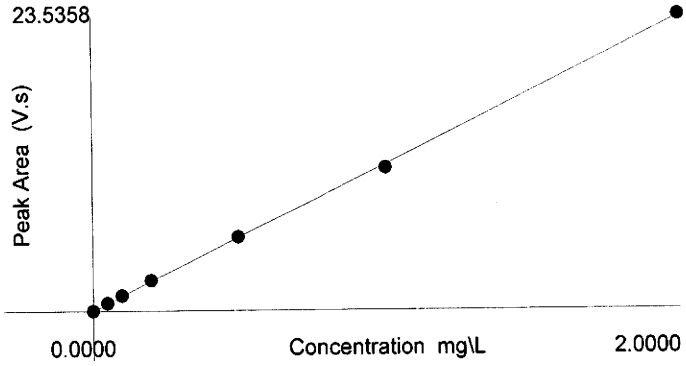
Area = 13.6476 * Conc + 0.0549
Conc = 0.0733 * Area - 0.0039
Correlation Coefficient (r) = 0.99996

Weighting : None

Table : 2 (NO2)

	Known Conc. (mg\L)	Rep.	Peak Area (V.s)	Peak Height (V)	% RSD	% Residual	Det. Conc (mg\L)	Detection Date	Detection Time
1	2.0000	1	23.5358	2.5190	0.0	-0.6	2.0106	12/19/2019	10:25:53 PM
2	1.0000	1	11.4169	1.2252	0.0	2.5	0.9746	12/19/2019	10:27:08 PM
3	0.5000	1	5.8970	0.6307	0.0	-0.5	0.5027	12/19/2019	10:28:23 PM
4	0.2000	1	2.4454	0.2629	0.0	-3.7	0.2076	12/19/2019	10:29:38 PM
5	0.1000	1	1.2205	0.1300	0.0	-2.8	0.1029	12/19/2019	10:30:54 PM
6	0.0500	1	0.6224	0.0658	0.0	-3.2	0.0518	12/19/2019	10:32:11 PM
7	0.0000	1	0.0126	9.2807e-4			-3.3633e-4	12/19/2019	10:33:27 PM

Figure : 2 (NO2)



Area = 11.6943 * Conc + 0.0182
Conc = 0.0855 * Area - 0.0014
Correlation Coefficient (r) = 0.99987

Weighting : None

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488593

Date Reported: 20-Dec-19
Run ID: R1765318
Date Analyzed: 19-Dec-19
ICAL Workgroup:
Instrument ID: FIA2

WG488593ICV

Tag: Measured: 12/19/2019 10:36:25 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND	2.387 ✓	1		mg/L	++	0.02	0.1			
SREV	NITRATE/NITRITE	REC	99	1		%	++	0.02	0.1			
SREV	NITRITE	FOUND	0.604	1		mg/L	++	0.01	0.05			
SREV	NITRITE	REC	99 ✓	1		%	++	0.01	0.05			

WG488593ICB

Tag: Measured: 12/19/2019 10:37:42 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND		1	U	mg/L	++	0.02	0.1			
SREV	NITRITE	FOUND		1	U ✓	mg/L	++	0.01	0.05			

WG488593LFB1

Tag: Measured: 12/19/2019 10:41:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND	1.967	1		mg/L	++	0.02	0.1			
SREV	NITRATE/NITRITE	REC	98	1		%	++	0.02	0.1			
SREV	NITRITE	FOUND	0.986	1		mg/L	++	0.01	0.05			
SREV	NITRITE	REC	99	1		%	++	0.01	0.05			

L56541-01

Tag: Measured: 12/19/2019 10:42:46 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	NITRATE/NITRITE	N-NO3NO2	2.85	1		mg/L	++	0.02	0.1			
SREV	NITRITE	N-NO2	.01	1	B	mg/L	++	0.01	0.05		RA	

L56541-01AS

Tag: Measured: 12/19/2019 10:44:01 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	NITRATE/NITRITE	FOUND	4.581	1		mg/L	++	0.02	0.1			
FAIL	NITRATE/NITRITE	REC	87	1		%	ALRT	0.02	0.1			
SREV	NITRITE	FOUND	0.981	1		mg/L	++	0.01	0.05			
SREV	NITRITE	REC	97	1		%	++	0.01	0.05			

L56543-02

Tag: Measured: 12/19/2019 10:45:17 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	NITRATE/NITRITE	N-NO3NO2	10.9	1	O	mg/L	OCAL	0.02	0.1			
SREV	NITRITE	N-NO2		1	U	mg/L	++	0.01	0.05		RA	

L56543-02DUP

Tag: Measured: 12/19/2019 10:46:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	NITRATE/NITRITE	FOUND	10.867	1		mg/L	++	0.02	0.1			
FAIL	NITRATE/NITRITE	RPD	0	1		%	++	0.02	0.1			
SREV	NITRITE	FOUND		1	U	mg/L	++	0.01	0.05			
SREV	NITRITE	RPD	0	1		%	++	0.01	0.05		RA	

L56331-2006231417

N-NO3NO2-MWMT

QC List Type: QC-RFA-NO3NO2
QCListMatClass: LIQUID
Bench Sheet List: I-ACFA-NO3NO2-MWMT
QC Ref: WC-RFA-D-SOL
Group ID: WC-G-RFA-NO3NO2-MWM
Method Ref: M353.2
SOP Ref: SOPWC016

WG488598

ACZ Laboratories, Inc

Instrument ID: FIA2
Analyst: PJD
ACZ Dept: 37
Create Date: 12/20/2019 0:34
Start Date/Time: 12/20/19
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep	Dil	N NO2 MWMT	N NO3NO2 MWMT	Nitrate/Nitrite (mg/L)	Nitrite (mg/L)	ph screen (units)	Chlorine Screen	Dilution	Comments
1	WG488598ICV	WI191112-1				1	☑	☑					1	
2	WG488598ICB	NONE				1	☑	☑					1	
3	WG488598LFB	WI191004-3				1	☑	☑					1	
4	WG488184PBS	NONE	W			1	☑	☑			7		1	
5	L56331-01	STSB32_0.5-3				1	☑	☑			8	–	1	centrifuged
6	L56331-01AS	WI191004-3				1	☑	☑		adjusted	8	–	1	
7	L56331-02	STSB32_6-15				1	☑	☑			8	–	1	
8	L56331-03	STSB34_0.5-3				1	☑	☑			8	–	1	
9	L56331-04	STSB34_6-15				1	☑	☑			8	–	1	
10	L56331-05	STSB33_0.5-3				1	☑	☑			8	–	1	
11	~~L56331-05MS1~~	~~MS191119-5~~				1	☑	☑					1	
12	~~L56331-05MSD1~~	~~MS191119-5~~	PJD 12/20/19			1	☑	☑					1	
13	WG488598CCV1	WI191219-1				1	☑	☑					1	
14	WG488598CCB1	NONE				1	☑	☑					1	
15	~~L56331-05MS2~~	~~II191204-3~~				1	☑	☑					1	
16	~~L56331-05MSD2~~	~~II191204-3~~				1	☑	☑					1	
17	L56331-06	STSB33_6-15	W			1	☑	☑			7	–	1	
18	L56331-07	STSB33-FD_0.5-3				1	☑	☑		adjusted	8	–	1	centrifuged
19	L56331-08	STSB35_0.5-3				1	☑	☑			8	–	1	
20	L56331-09	STSB35_6-15				1	☑	☑			8	–	1	

Report Comments:

Internal Comments

AREV: PJD 12/20/19
Initials, Date

SREV: KRH 12-20-19
Initials, Date

12/20/2019 12:34:50 AM 10120

ACZ Laboratories, Inc.
WET CHEM INSTRUMENT DATA REVIEW CHECKLIST

AREV: PJS
Date: 12/20/19

SREV: KRH
Date: 12-20-19

Instrument ID: FIA2

Work Group: 488598
Sample Type: NO3NO2-MUMT
Analysis Date: 12/20/19
Analyst: PJS

	Yes	No	N/A
1) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	X		
2) Is a current standard/reagent sheet attached to the workgroup?	X		
3) If applicable, was sample pH at log-in receipt and/or analysis within method criteria?	X		
4) Does the instrument calibration meet the specified method criteria? (r or $r^2 \geq 0.995$)	X		
5) Are all of the QC critera listed in LIMS within specified limits?	X		
6) If applicable, was a passing PQV indcluded in the WG?			X
7) Are all dilution factors correctly calculated and uploaded? (Soil, Sludges, Water)	X		
8) Are dilutions in the appropriate range? (explain if "B" or "U" reported for sample)	X		
9) Was sample-analysis completed within the holding time?	X		
10) Are all applicable qualifiers transferred from bench sheet to LIMS?	X		
11) **For soil/sludge analyses:** Was a hand calculated % recovery performed for LFM/MS/AS?			X
12) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? Y13 Calibration WG: 488593

Prep WG#: 488184 Disposable Vessel Lot#*: 1265326

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
331-09	DUP <10X MDL	RA

Comments: DUP made @ inst.

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

N-NO3NO2-MWMT

QC List Type: QC-RFA-NO3NO2
QCListMatClass: LIQUID
Bench Sheet List: I-ACFA-NO3NO2-MWMT
QC Ref: WC-RFA-D-SOL
Group ID: WC-G-RFA-NO3NO2-MWM
Method Ref: M353.2
SOP Ref: SOPWC016

WG488598

ACZ Laboratories, Inc

Instrument ID: FIA2
Analyst:
ACZ Dept: 37
Create Date: 12/20/2019 0:34
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	N NO2 MWMT	N NO3NO2 MWMT	Nitrate/Nitrite (mg/L)	Nitrite (mg/L)	ph screen (units)	Chlorine Screen	Dilution	Comments
21	WG488598CCV2	WI191219-1			1	☑	☑					1	
22	WG488598CCB2	NONE			1	☑	☑					1	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MS2	ICP Spike
L56331-05MSD1	ICPMS Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils

Report Comments:

Internal Comments

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/20/2019 12:34:50 AM 10120

L56331-2006231417

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 12:00
End Date/Time: 12/18/2019 18:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE															
2	WG488184CSTD2	NONE															
3	WG488184CSTD3	NONE															
4	WG488184ICV	PCN58503	AS REC		12/17/19 12:00		3.97		3.97	3.97							20.1
5	WG488184PBS	NONE	AS REC		12/17/19 13:40		4.89		6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
6	L56331-01	STSB32_0.5-3	AS REC		12/17/19 15:20	0	4.89	23	4.16	4.2	5238	5017	11.3	12/17/19 8:45	12/18/19 13:30	28.7499999999418	19.3
7	L56331-02	STSB32_6-15	AS REC		12/17/19 17:00	0	4.89	23	5.33	5.48	5700	5000.7	20.37	12/17/19 8:45	12/18/19 14:00	29.25	19.9
8	L56331-03	STSB34_0.5-3	AS REC		12/17/19 18:40	0	4.89	23	4.94	4.9	5253	5003	10.64	12/17/19 8:45	12/18/19 13:34	28.8666666666511	19.9
9	L56331-04	STSB34_6-15	AS REC		12/17/19 20:20	0	4.89	23	5.26	5.38	6092	5003.4	19.98	12/17/19 8:45	12/18/19 13:35	28.8333333331975	19.8
10	L56331-05	STSB33_0.5-3	AS REC		12/17/19 22:00	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
11	L56331-05MS1	MS191119-5	AS REC		12/17/19 23:40	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
12	L56331-05MSD1	MS191119-5	AS REC		12/18/19 1:20	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
13	L56331-05MS2	II191204-3	AS REC		12/18/19 3:00	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
14	L56331-05MSD2	II191204-3	AS REC		12/18/19 4:40	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
15	WG488184CCV1	PCN58503	AS REC		12/18/19 6:20		4.06		4.07	4.08							19.8
16	L56331-06	STSB33_6-15	AS REC		12/18/19 8:00	0	4.89	23	7.07	7.34	5492	5009.7	21.6	12/17/19 8:45	12/18/19 16:00	31.2499999998836	19.2
17	L56331-07	STSB33-FD_0.5-3	AS REC		12/18/19 9:40	0	4.89	23	4.28	4.34	5249	5000.3	16.22	12/17/19 8:45	12/18/19 14:25	29.6666666666279	19.2
18	L56331-08	STSB35_0.5-3	AS REC		12/18/19 11:20	0	4.89	23	4.25	4.21	5225	5000	11.69	12/17/19 8:45	12/18/19 14:15	29.4999999999418	19.2
19	L56331-09	STSB35_6-15	AS REC		12/18/19 13:00	0	4.89	23	3.87	3.8	5382	5004.4	11.16	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.4
20	WG488184LFB1	II191204-3	AS REC		12/18/19 14:40	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
21	WG488184LFB2	MS191119-5	AS REC		12/18/19 16:20	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
22	WG488184CCV2	PCN58503	AS REC		12/18/19 18:00		4.03		4.07	4.02							19.7

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/20/2019 2:12:44 AM 10120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488598

Date Reported: 20-Dec-19
Run ID: R1765319
Date Analyzed: 20-Dec-19
ICAL Workgroup: WG488593
Instrument ID: FIA2

WG488598CCV1

Tag:

Measured: 12/20/2019 12:37:11 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND	1.983	1		mg/L	++	0.02	0.1			
SREV	NITRATE/NITRITE	REC	99 ✓	1		%	++	0.02	0.1			
SREV	NITRITE	FOUND	0.991 ✓	1		mg/L	++	0.01	0.05			
SREV	NITRITE	REC	99	1		%	++	0.01	0.05			

WG488598CCB1

Tag:

Measured: 12/20/2019 12:40:09 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND		1	U ✓	mg/L	++	0.02	0.1			
SREV	NITRITE	FOUND		1	U	mg/L	++	0.01	0.05			

WG488598LFB

Tag:

Measured: 12/20/2019 12:41:26 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND	1.984 ✓	1		mg/L	++	0.02	0.1			
SREV	NITRATE/NITRITE	REC	99	1		%	++	0.02	0.1			
SREV	NITRITE	FOUND	0.995	1		mg/L	++	0.01	0.05			
SREV	NITRITE	REC	100 ✓	1		%	++	0.01	0.05			

WG488184PBS

Tag:

Measured: 12/20/2019 12:42:44 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND		1	U	mg/L	++	0.02	0.1			
SREV	NITRITE	FOUND		1	U ✓	mg/L	++	0.01	0.05			

L56331-01

Tag:

Measured: 12/20/2019 12:44:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	)2-MWMT	.87	1		mg/L	++	0.02	0.1		HD Q6 TB	
SREV	NITRITE	)2-MWMT		1	U	mg/L	++	0.01	0.05		HD Q6 TB	

L56331-01AS

Tag:

Measured: 12/20/2019 12:45:17 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND	2.774 ✓	1		mg/L	++	0.02	0.1			
SREV	NITRATE/NITRITE	REC	95	1		%	++	0.02	0.1			
SREV	NITRITE	FOUND	1.017	1		mg/L	++	0.01	0.05			
SREV	NITRITE	REC	102 ✓	1		%	++	0.01	0.05			

L56331-02

Tag:

Measured: 12/20/2019 12:46:34 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	)2-MWMT	.04	1	B	mg/L	++	0.02	0.1		HD Q6 TB	
SREV	NITRITE	)2-MWMT		1	U	mg/L	++	0.01	0.05		HD Q6 TB	

L56331-03

Tag: Measured: 12/20/2019 12:47:51 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	)2-MWMT	.26	1		mg/L	++	0.02	0.1		HD Q6 TB	
SREV	NITRITE	)2-MWMT		1	U	mg/L	++	0.01	0.05		HD Q6 TB	

L56331-04

Tag: Measured: 12/20/2019 12:49:07 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	)2-MWMT	.24	1		mg/L	++	0.02	0.1		HD Q6 TB	
SREV	NITRITE	)2-MWMT		1	U	mg/L	++	0.01	0.05		HD Q6 TB	

L56331-05

Tag: Measured: 12/20/2019 12:50:23 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	)2-MWMT	.41	1		mg/L	++	0.02	0.1		HD Q6 TB	
SREV	NITRITE	)2-MWMT		1	U	mg/L	++	0.01	0.05		HD Q6 TB	

L56331-06

Tag: Measured: 12/20/2019 12:51:39 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	)2-MWMT	.05	1	B	mg/L	++	0.02	0.1		HD Q6 TB	
SREV	NITRITE	)2-MWMT		1	U	mg/L	++	0.01	0.05		HD Q6 TB	

L56331-07

Tag: Measured: 12/20/2019 12:52:55 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	)2-MWMT	.35	1		mg/L	++	0.02	0.1		HD Q6 TB	
SREV	NITRITE	)2-MWMT		1	U	mg/L	++	0.01	0.05		HD Q6 TB	

WG488598CCV2

Tag: Measured: 12/20/2019 12:54:10 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND	1.997	1		mg/L	++	0.02	0.1			
SREV	NITRATE/NITRITE	REC	100 ✓	1		%	++	0.02	0.1			
SREV	NITRITE	FOUND	0.99 ✓	1		mg/L	++	0.01	0.05			
SREV	NITRITE	REC	99	1		%	++	0.01	0.05			

WG488598CCB2

Tag: Measured: 12/20/2019 12:57:08 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND		1	U ✓	mg/L	++	0.02	0.1			
SREV	NITRITE	FOUND		1	U	mg/L	++	0.01	0.05			

L56331-08

Tag: Measured: 12/20/2019 12:58:24 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	)2-MWMT	.31	1		mg/L	++	0.02	0.1		HD Q6 TB	
SREV	NITRITE	)2-MWMT		1	U	mg/L	++	0.01	0.05		HD Q6 TB	

L56331-09

Tag: Measured: 12/20/2019 12:59:40 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	)2-MWMT		1	U	mg/L	++	0.02	0.1		HD Q6 RA TB	
SREV	NITRITE	)2-MWMT		1	U	mg/L	++	0.01	0.05		HD Q6 RA TB	

L56331-09DUP

Tag:

Measured: 12/20/2019 1:00:55 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND		1	U ✓	mg/L	++	0.02	0.1			
SREV	NITRATE/NITRITE	RPD	0	1		%	++	0.02	0.1		RA	
SREV	NITRITE	FOUND		1	U	mg/L	++	0.01	0.05			
SREV	NITRITE	RPD	0	1		%	++	0.01	0.05		RA	

WG488598CCV3

Tag:

Measured: 12/20/2019 1:03:52 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND	1.989	1		mg/L	++	0.02	0.1			
SREV	NITRATE/NITRITE	REC	99	1		%	++	0.02	0.1			
SREV	NITRITE	FOUND	0.988 ✓	1		mg/L	++	0.01	0.05			
SREV	NITRITE	REC	99	1		%	++	0.01	0.05			

WG488598CCB3

Tag:

Measured: 12/20/2019 1:06:49 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITRATE/NITRITE	FOUND		1	U ✓	mg/L	++	0.02	0.1			
SREV	NITRITE	FOUND		1	U	mg/L	++	0.01	0.05			

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG488598 **N-NO3NO2-MWMT**

Sample	Date	SCN	NITRATE/NITRITE	NITRITE
WG488598CCV1	12/20/19 00:37	WI191219-1	X	X
WG488598CCB1	12/20/19 00:40		X	X
WG488598LFB	12/20/19 00:41	WI191004-3	X	X
WG488184PBS	12/20/19 00:42		X	X
L56331-01	12/20/19 00:44		X	X
L56331-01AS	12/20/19 00:45	WI191004-3	X	X
L56331-02	12/20/19 00:46		X	X
L56331-03	12/20/19 00:47		X	X
L56331-04	12/20/19 00:49		X	X
L56331-05	12/20/19 00:50		X	X
L56331-06	12/20/19 00:51		X	X
L56331-07	12/20/19 00:52		X	X
WG488598CCV2	12/20/19 00:54	WI191219-1	X	X
WG488598CCB2	12/20/19 00:57		X	X
L56331-08	12/20/19 00:58		X	X
L56331-09	12/20/19 00:59		X	X
L56331-09DUP	12/20/19 01:00		X	X
WG488598CCV3	12/20/19 01:03	WI191219-1	X	X
WG488598CCB3	12/20/19 01:06		X	X

L56331-2006231417

X-CN-WAD-MWMT

QC List Type: I-WCPREP-CN
QCListMatClass: LIQUID
Bench Sheet List: I-WCPREP-CN
QC Ref: WC PREP
Group ID: IP-G-WC-WAD-MWMT
Method Ref: SM4500 CN-I
SOP Ref: SOPWC072

WG489178

ACZ Laboratories, Inc

Instrument ID: WCDIG
Analyst: wtc
ACZ Dept: 30
Create Date: 01/01/2020 8:25
Start Date/Time: 01/01/2020 11:00
End Date/Time: 01/01/2020 13:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	CN WAD MWMT	pH Screen (units)	Sulfide Screen	Chlorine Screen	Sample Volume (mL)	Final Volume (mL)	Dilution	Comments
1	WG489178LRB	NONE	mwmt		01/01/20 11:00	☑	12	-	-	50	25	1	
2	WG489178LFB	WI191230-7	mwmt		01/01/20 11:09	☑	12	-	-	50	25	1	
3	WG488184PBS	NONE	mwmt		01/01/20 11:18	☑	14	-	-	50	25	1	
4	L56331-01	STSB32_0.5-3	mwmt		01/01/20 11:27	☑	14	-	-	50	25	1	
5	L56331-01DUP	NONE	mwmt		01/01/20 11:36	☑	14	-	-	50	25	1	
6	L56331-02	STSB32_6-15	mwmt		01/01/20 11:46	☑	14	-	-	50	25	1	
7	L56331-02LFM	WI191230-7	mwmt		01/01/20 11:55	☑	14	-	-	50	25	1	
8	L56331-03	STSB34_0.5-3	mwmt		01/01/20 12:04	☑	14	-	-	50	25	1	
9	L56331-04	STSB34_6-15	mwmt		01/01/20 12:13	☑	14	-	-	50	25	1	
10	L56331-05	STSB33_0.5-3	mwmt		01/01/20 12:23	☑	14	-	-	50	25	1	
11	L56331-06	STSB33_6-15	mwmt		01/01/20 12:32	☑	14	-	-	50	25	1	
12	L56331-07	STSB33-FD_0.5-3	mwmt		01/01/20 12:41	☑	14	-	-	50	25	1	
13	L56331-08	STSB35_0.5-3	mwmt		01/01/20 12:50	☑	14	-	-	50	25	1	
14	L56331-09	STSB35_6-15	mwmt		01/01/20 13:00	☑	14	-	-	50	25	1	

Report Comments: _____

Internal Comments _____

AREV: wtc 1/1/20
Initials, Date

SREV: KRH 1-2-20
Initials, Date

1/1/2020 1:58:44 PM 10120

ACZ Laboratories, Inc.

WC INST PREP REVIEW CHECKLIST

AREV:	WTC
Date:	1/1/20
SREV:	KRH
Date:	1-2-20

Work Group:	489178
Sample Type:	X-CN-WAD-MWMT
Prep Date:	1/1/20
Analyst:	WTC

	YES	NO	N / A
1.) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
2.) Are all samples received in the appropriate sample container? *			✓
3.) **For CN-T:** Is a PQV included if DW samples are present in the WG?			✓
4.) **For CN:** Is the correct sample pH documented on the bench sheet and entered in LIMS?	✓		✓ WTC 1/1/20
5.) **For CN:** Is any sample with pH < 12 appropriately "Q" qualified?			✓
6.) **For CN:** Was any sample that tested (+) for sulfide prepped within 24 hours from collection? *			✓
7.) Are the correct dilution factors documented on the bench sheet and entered in LIMS?	✓		
8.) Is any sample prepared on dilution appropriately "D" qualified?			✓
9.) Is a current standard/reagent form included with the workgroup?	✓		
10.) **For Solids:** Are all quarantined samples entered into the 'Quaranteen Spreadsheet' and disposed of properly?			✓
11.) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Disposable Vessel Lot#**: E7-9-9338-NG Soils Department Prep Workgroup: 488184

For any item listed above that is checked "No" state the corrective action/explanation in the sections below.

QC/Sample ID	Problem	Corrective Action

Comments:

* If "No" then data must be appropriately qualifed.

** Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

X-CN-WAD-MWMT

WG489178

ACZ Laboratories, Inc

QC List Type: I-WCPREP-CN
QCListMatClass: LIQUID
Bench Sheet List: I-WCPREP-CN
QC Ref: WC PREP
Group ID: IP-G-WC-WAD-MWMT
Method Ref: SM4500 CN-I
SOP Ref: SOPWC072

Instrument ID: WCDIG
Analyst: wtc
ACZ Dept: 30
Create Date: 01/01/2020 8:25
Start Date/Time: 01/01/2020 11:00
End Date/Time: 01/01/2020 13:00

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/1/2020 1:58:44 PM 10120

L56331-2006231417

X-CN-WAD-MWMT

QC List Type: I-WCPREP-CN
QCListMatClass: LIQUID
Bench Sheet List: I-WCPREP-CN
QC Ref: WC PREP
Group ID: IP-G-WC-WAD-MWMT
Method Ref: SM4500 CN-I
SOP Ref: SOPWC072

WG489178

ACZ Laboratories, Inc

Instrument ID: WCDIG
Analyst: LTC
ACZ Dept: 30
Create Date: 01/01/2020 8:25
Start Date/Time: 1/a
End Date/Time: 1p

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	CN WAD MWMT	pH Screen (units)	Sulfide Screen	Chlorine Screen	Sample Volume (mL)	Final Volume (mL)	Dilution	Comments
1	WG489178LRB	NONE	MWMT			☑	12	–	–	50	25	1	
2	WG489178LFB	WI191230-7				☑	12					1	
3	WG488184PBS	NONE				☑	14					1	
4	L56331-01	STSB32_0.5-3				☑						1	
5	L56331-01DUP	NONE				☑						1	
6	L56331-02	STSB32_6-15				☑						1	
7	L56331-02LFM	WI191230-7				☑						1	
8	L56331-03	STSB34_0.5-3				☑						1	
9	L56331-04	STSB34_6-15				☑						1	
10	L56331-05	STSB33_0.5-3				☑						1	
11	L56331-06	STSB33_6-15				☑						1	
12	L56331-07	STSB33-FD_0.5-3				☑						1	
13	L56331-08	STSB35_0.5-3				☑						1	
14	L56331-09	STSB35_6-15				☑						1	

Report Comments: E7-7-1338 -NC

Internal Comments

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/1/2020 8:25:45 AM 10120

X-CN-WAD-MWMT

WG489178

ACZ Laboratories, Inc

QC List Type: I-WCPREP-CN
QCListMatClass: LIQUID
Bench Sheet List: I-WCPREP-CN
QC Ref: WC PREP
Group ID: IP-G-WC-WAD-MWMT
Method Ref: SM4500 CN-I
SOP Ref: SOPWC072

Instrument ID: WCDIG
Analyst:
ACZ Dept: 30
Create Date: 01/01/2020 8:25
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/1/2020 8:25:45 AM 10120

L56331-2006231417

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 17:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE															
2	WG488184CSTD2	NONE															
3	WG488184CSTD3	NONE															
4	WG488184ICV	PCN58503															
5	WG488184PBS	NONE	AS REC		12/18/19 17:59		4.89		6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
6	L56331-01	STSB32_0.5-3	AS REC		12/17/19 7:00	0	4.89	23	4.16	4.2	5000	5017	11.3	12/17/19 8:45	12/18/19 13:30	28.7499999999418	19.3
7	L56331-02	STSB32_6-15	AS REC		12/17/19 8:35	0	4.89	23	5.33	5.48	5000	5000.7	20.37	12/17/19 8:45	12/18/19 14:00	29.25	19.9
8	L56331-03	STSB34_0.5-3	AS REC		12/17/19 10:10	0	4.89	23	4.94	4.9	5000	5003	10.64	12/17/19 8:45	12/18/19 13:34	28.8166666666511	19.9
9	L56331-04	STSB34_6-15	AS REC		12/17/19 11:46	0	4.89	23	5.26	5.38	5000	5003.4	19.98	12/17/19 8:45	12/18/19 13:35	28.8333333331975	19.8
10	L56331-05	STSB33_0.5-3	AS REC		12/17/19 13:21	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
11	L56331-05MS1	MS191119-5	AS REC		12/17/19 14:57	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
12	L56331-05MSD1	MS191119-5	AS REC		12/17/19 18:08	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
13	L56331-05MS2	II191204-3	AS REC		12/17/19 16:32	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
14	L56331-05MSD2	II191204-3	AS REC		12/17/19 19:43	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
15	WG488184CCV1	PCN58503	AS REC		12/18/19 3:40		4.06		4.07	4.08							19.8
16	L56331-06	STSB33_6-15	AS REC		12/17/19 21:19	0	4.89	23	7.07	7.34	5000	5009.7	21.6	12/17/19 8:45	12/18/19 16:00	31.2499999998836	19.2
17	L56331-07	STSB33-FD_0.5-3	AS REC		12/17/19 22:54	0	4.89	23	4.28	4.34	5000	5000.3	16.22	12/17/19 8:45	12/18/19 14:25	29.6666666666279	19.2
18	L56331-08	STSB35_0.5-3	AS REC		12/18/19 0:29	0	4.89	23	4.25	4.21	5000	5000	11.69	12/17/19 8:45	12/18/19 14:15	29.4999999999418	19.2
19	L56331-09	STSB35_6-15	AS REC		12/18/19 2:05	0	4.89	23	3.87	3.8	5000	5004.4	11.16	12/17/19 8:45	12/18/19 14:15	29.4999999999418	19.4
20	WG488184ICV1		AS REC		12/18/19 13:13		3.97		3.97	3.97							20.1
20	WG488184LFB1	II191204-3	AS REC		12/18/19 14:49	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
21	WG488184LFB2	MS191119-5	AS REC		12/18/19 16:24	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/1/2020 2:00:10 PM 10120

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 17:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
22	WG488184CCV2	PCN58503	AS REC		12/18/19 5:16		4.03		4.07	4.02							19.7

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MS2	ICP Spike
L56331-05MSD1	ICPMS Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184CCV1	pH QC
WG488184CCV2	pH QC
WG488184CSTD1	pH QC
WG488184CSTD2	pH QC
WG488184CSTD3	pH QC
WG488184ICV	pH QC
WG488184ICV1	WG488184ICV1
WG488184LFB1	ICP LFB
WG488184LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/1/2020 2:00:10 PM 10120

ACZ LABORATORIES, INC
2773 Downhill Drive
Steamboat Springs, CO 80487

WET CHEMISTRY INSTRUMENT
REAGENTS INFORMATION

Instrument: LACHAT

Parameter: CYANIDE **WAD** AQ / LOW LEVEL /SOILS / MWMT / 1312 / NV

Prep Reagents

	PCN	Prep Analyst	Expiration
1) 0.25N NaOH	PCN58925	KRH	11/25/2020
2) Sodium Acetate Buffer	WIR191106-3	ttg	11/6/2020
3) Zinc Acetate Solution	PCN57610	mss2	11/12/2020
4) Methyl Red Indicator Solution	PCN57292	ttg	8/21/2020
5) Purple Sample Matrix	PCN57958	wtc	9/26/2020
6) 10 % Acetic Acid Solution	PCN58941	ttg	9/6/2020
5) Bismuth Nitrate for Sulfide Treatment			
6) Ascorbic Acid for Chlorine Treatment	PCN55138		4/30/2020

See SOP for standard and reagent prep

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG489178

Date Reported: 02-Jan-20
Run ID: R1766284
Date Analyzed: 01-Jan-20
ICAL Workgroup:
Instrument ID: WCDIG

WG489178LRB

Tag: Measured: 1/1/2020 11:00:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	TEXT		1			++			-		
SREV	FINAL VOLUME	PREP	25	1		mL	++					
SREV	PH SCREEN	PREP	12	1		units	++					
SREV	SULFIDE SCREEN	TEXT		1			++			-		
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

WG489178LFB

Tag: Measured: 1/1/2020 11:09:14 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	TEXT		1			++			-		
SREV	FINAL VOLUME	PREP	25	1		mL	++					
SREV	PH SCREEN	PREP	12	1		units	++					
SREV	SULFIDE SCREEN	TEXT		1			++			-		
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

WG488184PBS

Tag: Measured: 1/1/2020 11:18:28 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	TEXT		1			++			-		
SREV	FINAL VOLUME	PREP	25	1		mL	++					
SREV	PH SCREEN	PREP	14	1		units	++					
SREV	SULFIDE SCREEN	TEXT		1			++			-		
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-01

Tag: Measured: 1/1/2020 11:27:42 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	,D-MWMT		1			++			-		
SREV	FINAL VOLUME	,D-MWMT	25	1		mL	++					
SREV	PH SCREEN	,D-MWMT	14	1		units	++					
SREV	SULFIDE SCREEN	,D-MWMT		1			++			-		
SREV	VOLUME, SAMPLE	,D-MWMT	50	1		mL	++					

L56331-01DUP

Tag: Measured: 1/1/2020 11:36:56 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	TEXT		1			++			-		
SREV	FINAL VOLUME	PREP	25	1		mL	++					
SREV	PH SCREEN	PREP	14	1		units	++					
SREV	SULFIDE SCREEN	TEXT		1			++			-		
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-02

Tag: Measured: 1/1/2020 11:46:10 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	,D-MWMT		1			++			-		
SREV	FINAL VOLUME	,D-MWMT	25	1		mL	++					
SREV	PH SCREEN	,D-MWMT	14	1		units	++					
SREV	SULFIDE SCREEN	,D-MWMT		1			++			-		
SREV	VOLUME, SAMPLE	,D-MWMT	50	1		mL	++					

L56331-02LFM

Tag: Measured: 1/1/2020 11:55:24 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	TEXT		1			++			-		
SREV	FINAL VOLUME	PREP	25	1		mL	++					
SREV	PH SCREEN	PREP	14	1		units	++					
SREV	SULFIDE SCREEN	TEXT		1			++			-		
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					

L56331-03

Tag: Measured: 1/1/2020 12:04:38 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	,D-MWMT		1			++			-		
SREV	FINAL VOLUME	,D-MWMT	25	1		mL	++					
SREV	PH SCREEN	,D-MWMT	14	1		units	++					
SREV	SULFIDE SCREEN	,D-MWMT		1			++			-		
SREV	VOLUME, SAMPLE	,D-MWMT	50	1		mL	++					

L56331-04

Tag: Measured: 1/1/2020 12:13:52 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	,D-MWMT		1			++			-		
SREV	FINAL VOLUME	,D-MWMT	25	1		mL	++					
SREV	PH SCREEN	,D-MWMT	14	1		units	++					
SREV	SULFIDE SCREEN	,D-MWMT		1			++			-		
SREV	VOLUME, SAMPLE	,D-MWMT	50	1		mL	++					

L56331-05

Tag: Measured: 1/1/2020 12:23:06 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	,D-MWMT		1			++			-		
SREV	FINAL VOLUME	,D-MWMT	25	1		mL	++					
SREV	PH SCREEN	,D-MWMT	14	1		units	++					
SREV	SULFIDE SCREEN	,D-MWMT		1			++			-		
SREV	VOLUME, SAMPLE	,D-MWMT	50	1		mL	++					

L56331-06

Tag: Measured: 1/1/2020 12:32:20 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	,D-MWMT		1			++			-		
SREV	FINAL VOLUME	,D-MWMT	25	1		mL	++					
SREV	PH SCREEN	,D-MWMT	14	1		units	++					
SREV	SULFIDE SCREEN	,D-MWMT		1			++			-		
SREV	VOLUME, SAMPLE	,D-MWMT	50	1		mL	++					

L56331-07

Tag:

Measured: 1/1/2020 12:41:34 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	,D-MWMT		1			++			-		
SREV	FINAL VOLUME	,D-MWMT	25	1		mL	++					
SREV	PH SCREEN	,D-MWMT	14	1		units	++					
SREV	SULFIDE SCREEN	,D-MWMT		1			++			-		
SREV	VOLUME, SAMPLE	,D-MWMT	50	1		mL	++					

L56331-08

Tag:

Measured: 1/1/2020 12:50:48 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	,D-MWMT		1			++			-		
SREV	FINAL VOLUME	,D-MWMT	25	1		mL	++					
SREV	PH SCREEN	,D-MWMT	14	1		units	++					
SREV	SULFIDE SCREEN	,D-MWMT		1			++			-		
SREV	VOLUME, SAMPLE	,D-MWMT	50	1		mL	++					

L56331-09

Tag:

Measured: 1/1/2020 1:00:02 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	CHLORINE SCREEN	,D-MWMT		1			++			-		
SREV	FINAL VOLUME	,D-MWMT	25	1		mL	++					
SREV	PH SCREEN	,D-MWMT	14	1		units	++					
SREV	SULFIDE SCREEN	,D-MWMT		1			++			-		
SREV	VOLUME, SAMPLE	,D-MWMT	50	1		mL	++					

Wood - E&I Solutions, Inc.

Project ID: L56331

Inorganic Prep

WG489178 **X-CN-WAD-MWMT**

Sample	Date	SCN	CHLORINE SCREEN	SULFIDE SCREEN
WG489178LRB	01/01/20 11:00		X	X
WG489178LFB	01/01/20 11:09		X	X
WG488184PBS	01/01/20 11:18		X	X
L56331-01	01/01/20 11:27		X	X
L56331-01DUP	01/01/20 11:36		X	X
L56331-02	01/01/20 11:46		X	X
L56331-02LFM	01/01/20 11:55		X	X
L56331-03	01/01/20 12:04		X	X
L56331-04	01/01/20 12:13		X	X
L56331-05	01/01/20 12:23		X	X
L56331-06	01/01/20 12:32		X	X
L56331-07	01/01/20 12:41		X	X
L56331-08	01/01/20 12:50		X	X
L56331-09	01/01/20 13:00		X	X

L56331-2006231417

Total Dissolved Solids - MWMT

QC List Type: QC-TDS
QCListMatClass: LIQUID
Bench Sheet List: I-TDS
QC Ref: PBW-DUP-LCSW
Group ID: WC-G-MAN-TDS-MWMT
Method Ref: SM2540 C
SOP Ref: SOPWC024

WG489166

ACZ Laboratories, Inc

Instrument ID: WC-MANUAL
Analyst: MLH
ACZ Dept: 37
Create Date: 12/31/2019 16:13
Start Date/Time: 12/31/2019 16:13
End Date/Time: 12/31/2019 16:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	Analysis Date	Initial Weight (g)	Sample Volume (mL)	Final Weight 1 (g)	Final Weight (g)	Amount of Residue (g)	Weight Difference (g)	Weight Check	Total Dissolved Solids (mg/L)	Comments
1	WG489166PBW	NONE	solis prep			12/31/19 16:13	59.4652	50	59.4655	59.4652	0.0000	.00030	Pass	.0000	#904 NCW
2	WG489166LCSW	PCN59646	solis prep			12/31/19 16:16	69.111	50	69.1608	69.161	0.0500	.00020	Pass	1000.0000	
3	WG488184PBS	NONE	solis prep			12/31/19 16:19	68.6177	50	68.6185	68.6189	0.0012	.00040	Pass	24.0000	
4	L56331-01	STSB32_0.5-3	solis prep			12/31/19 16:23	59.8272	25	59.9431	59.943	0.1158	.00010	Pass	4632.0000	
5	L56331-02	STSB32_6-15	solis prep			12/31/19 16:26	48.9964	50	49.1609	49.1609	0.1645	.00000	Pass	3290.0000	
6	L56331-03	STSB34_0.5-3	solis prep			12/31/19 16:29	63.8942	50	64.0337	64.0333	0.1391	.00040	Pass	2782.0000	
7	L56331-04	STSB34_6-15	solis prep			12/31/19 16:33	60.7391	50	60.9296	60.9294	0.1903	.00020	Pass	3806.0001	
8	L56331-04DUP	NONE	solis prep			12/31/19 16:36	55.3337	50	55.5222	55.5221	0.1884	.00010	Pass	3768.0000	
9	L56331-05	STSB33_0.5-3	solis prep			12/31/19 16:39	69.9669	50	70.1368	70.1364	0.1695	.00040	Pass	3389.9999	
10	L56331-06	STSB33_6-15	solis prep			12/31/19 16:43	67.5698	50	67.6255	67.6254	0.0556	.00010	Pass	1112.0000	
11	L56331-07	STSB33-FD_0.5-3	solis prep			12/31/19 16:46	58.4363	50	58.602	58.6019	0.1656	.00010	Pass	3312.0000	
12	L56331-08	STSB35_0.5-3	solis prep			12/31/19 16:49	68.2025	50	68.3691	68.3688	0.1663	.00030	Pass	3326.0000	
13	L56331-09	STSB35_6-15	solis prep			12/31/19 16:53	68.7249	25	68.8476	68.8476	0.1227	.00000	Pass	4907.9999	
14	WG488413PBS	NONE	solis prep			12/31/19 16:56	69.4154	50	69.4161	69.4161	0.0007	.00000	Pass	14.0000	
15	L56452-01	LPT-1	solis prep			12/31/19 16:59	67.5707	50	67.6059	67.606	0.0353	.00010	Pass	706.0000	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56452-01	SJ(2) || quarantined

Report Comments: _____

Internal Comments _____

AREV: MLH 1/6/20
Initials, Date

SREV: EMK 1/8/2020
Initials, Date

1/6/2020 4:36:30 PM 123119

ACZ Laboratories, Inc.

WET CHEMISTRY SOLIDS DATA REVIEW CHECKLIST

AREV: MLH
Date: 1/6/20

Work Group: 489166
Sample Type: TDS-MWMT
Analysis Date: 12/31/19
Analyst: MLH

SREV: EMK
Date: 1/8/2020

	Yes	No	N/A
1.) Are all weights properly entered?	✓✓		
2.) Are all sample volumes properly entered?	✓✓		
3.) Do all samples pass the constant weight check? If No, update status to REDO.	✓✓		
4.) Do all samples have < **0.20** g of residue? If no, redo sample(s) using less volume.	✓✓		
5.) Is any sample analyzed using less volume appropriately "D" qualified (except > **0.20** g)?			✓✓
6.) Is any sample with a Z3 auto qualifier run at 1x? If no, redo sample(s) on a lower dilution.	✓		✓ EMK 1/8/2020
7.) Are all of the QC critera listed in LIMS within specified limits?	✓✓		
8.) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓✓		
9.) Are all analyses within method holding time? Flag data if "No."		✓✓	
10.) Are drying oven temperatures and times recorded on the WG Benchsheets?	✓✓		
11.) **For WG's containing DW sample(s)**: PQV included with WG?			✓✓
12.) **For TSS only:** Is PBW volume ≥ largest volume of client sample?			✓✓
13.) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

For any item listed above that is checked "No" state the corrective action/explanation in the sections below.

QC/Sample ID	EMK 1/8/2020 Analytical Problem	Corrective action
331-~~01 209~~ 01,09	Past Hold	HZ
452-01	↓	~~↓~~ HC EMK 1/8/2020
331-02-06	↓	↓

Comments:

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

FRMWC012.02.16.16

Total Dissolved Solids - MWMT

QC List Type: QC-TDS
QCListMatClass: LIQUID
Bench Sheet List: I-TDS
QC Ref: PBW-DUP-LCSW
Group ID: WC-G-MAN-TDS-MWMT
Method Ref: SM2540 C
SOP Ref: SOPWC024

WG489166

ACZ Laboratories, Inc

Instrument ID: WC-MANUAL
Analyst: MLH
ACZ Dept: 37
Create Date: 12/31/2019 16:13
Start Date/Time: 12/31/2019 16:13
End Date/Time: 12/31/2019 16:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	Analysis Date	Initial Weight (g)	Sample Volume (mL)	Final Weight 1 (g)	Final Weight (g)	Amount of Residue (g)	Weight Difference (g)	Weight Check	Total Dissolved Solids (mg/L)	Comments
1	WG489166PBW	NONE	solis prep			12/31/19 16:13	59.4652	50	59.4655	59.4652	0.0000	.00030	Pass	.0000	#904 NCW
2	WG489166LCSW	PCN59646	solis prep			12/31/19 16:16	69.111	50	69.1608	69.161	0.0500	.00020	Pass	1000.0000	
3	WG488184PBS	NONE	solis prep			12/31/19 16:19	68.6177	50	68.6185	68.6189	0.0012	.00040	Pass	24.0000	
4	L56331-01	STSB32_0.5-3	solis prep			12/31/19 16:23	59.8272	25	59.9438	59.9431	0.1159	.00070	Dry More	4636.0001	
5	L56331-02	STSB32_6-15	solis prep			12/31/19 16:26	48.9964	50	49.1617	49.1609	0.1645	.00080	Dry More	3290.0000	
6	L56331-03	STSB34_0.5-3	solis prep			12/31/19 16:29	63.8942	50	64.0337	64.0333	0.1391	.00040	Pass	2782.0000	
7	L56331-04	STSB34_6-15	solis prep			12/31/19 16:33	60.7391	50	60.9304	60.9296	0.1905	.00080	Dry More	3810.0001	
8	L56331-04DUP	NONE	solis prep			12/31/19 16:36	55.3337	50	55.5229	55.5222	0.1885	.00070	Dry More	3770.0000	
9	L56331-05	STSB33_0.5-3	solis prep			12/31/19 16:39	69.9669	50	70.1368	70.1364	0.1695	.00040	Pass	3389.9999	
10	L56331-06	STSB33_6-15	solis prep			12/31/19 16:43	67.5698	50	67.6255	67.6254	0.0556	.00010	Pass	1112.0000	
11	L56331-07	STSB33-FD_0.5-3	solis prep			12/31/19 16:46	58.4363	50	58.6027	58.602	0.1657	.00070	Dry More	3314.0001	
12	L56331-08	STSB35_0.5-3	solis prep			12/31/19 16:49	68.2025	50	68.3691	68.3688	0.1663	.00030	Pass	3326.0000	
13	L56331-09	STSB35_6-15	solis prep			12/31/19 16:53	68.7249	25	68.8481	68.8476	0.1227	.00050	Dry More	4907.9999	
14	WG488413PBS	NONE	solis prep			12/31/19 16:56	69.4154	50	69.4161	69.4161	0.0007	.00000	Pass	14.0000	
15	L56452-01	LPT-1	solis prep			12/31/19 16:59	67.5707	50	67.6059	67.606	0.0353	.00010	Pass	706.0000	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56452-01	SJ(2) || quarantined

Report Comments: 180°C 9:23 1/6/20
180 °C 10:25 ⊥

Internal Comments

AREV: Initials, Date

SREV: Initials, Date

1/6/2020 9:23:29 AM 123119

L56331-2006231417

Total Dissolved Solids - MWMT

QC List Type: QC-TDS
QCListMatClass: LIQUID
Bench Sheet List: I-TDS
QC Ref: PBW-DUP-LCSW
Group ID: WC-G-MAN-TDS-MWMT
Method Ref: SM2540 C
SOP Ref: SOPWC024

WG489166

ACZ Laboratories, Inc

Instrument ID: WC-MANUAL
Analyst: MLH
ACZ Dept: 37
Create Date: 12/31/2019 16:13
Start Date/Time: 12/31/2019 16:13
End Date/Time: 12/31/2019 16:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	Analysis Date	Initial Weight (g)	Sample Volume (mL)	Final Weight 1 (g)	Final Weight (g)	Amount of Residue (g)	Weight Difference (g)	Weight Check	Total Dissolved Solids (mg/L)	Comments
1	WG489166PBW	NONE	solis prep			12/31/19 16:13	59.4652	50	59.4655	59.466	0.0008	.00050	Dry More	16.0000	#904
2	WG489166LCSW	PCN59646	solis prep			12/31/19 16:16	69.111	50	69.1608	69.161	0.0500	.00020	Pass	1000.0000	
3	WG488184PBS	NONE	solis prep			12/31/19 16:19	68.6177	50	68.6185	68.6189	0.0012	.00040	Pass	24.0000	
4	L56331-01	STSB32_0.5-3	solis prep			12/31/19 16:23	59.8272	25	59.9444	59.9438	0.1166	.00060	Dry More	4664.0000	
5	L56331-02	STSB32_6-15	solis prep			12/31/19 16:26	48.9964	50	49.1624	49.1617	0.1653	.00070	Dry More	3305.9999	
6	L56331-03	STSB34_0.5-3	solis prep			12/31/19 16:29	63.8942	50	64.0337	64.0333	0.1391	.00040	Pass	2782.0000	
7	L56331-04	STSB34_6-15	solis prep			12/31/19 16:33	60.7391	50	60.9311	60.9304	0.1913	.00070	Dry More	3826.0001	
8	L56331-04DUP	NONE	solis prep			12/31/19 16:36	55.3337	50	55.5244	55.5229	0.1892	.00150	Dry More	3784.0000	
9	L56331-05	STSB33_0.5-3	solis prep			12/31/19 16:39	69.9669	50	70.1368	70.1364	0.1695	.00040	Pass	3389.9999	
10	L56331-06	STSB33_6-15	solis prep			12/31/19 16:43	67.5698	50	67.6255	67.6254	0.0556	.00010	Pass	1112.0000	
11	L56331-07	STSB33-FD_0.5-3	solis prep			12/31/19 16:46	58.4363	50	58.6034	58.6027	0.1664	.00070	Dry More	3328.0000	
12	L56331-08	STSB35_0.5-3	solis prep			12/31/19 16:49	68.2025	50	68.3701	68.3691	0.1666	.00100	Dry More	3332.0001	
13	L56331-09	STSB35_6-15	solis prep			12/31/19 16:53	68.7249	25	68.8487	68.8481	0.1232	.00060	Dry More	4928.0000	
14	WG488413PBS	NONE	solis prep			12/31/19 16:56	69.4154	50	69.4161	69.4161	0.0007	.00000	Pass	14.0000	
15	L56452-01	LPT-1	solis prep			12/31/19 16:59	67.5707	50	67.6059	67.606	0.0353	.00010	Pass	706.0000	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56452-01	SJ(2) || quarantined

Report Comments: In 180°C @ 10:30 1/3/20
Out 1 11:38 1

Internal Comments

AREV: Initials, Date

SREV: Initials, Date

1/3/2020 10:30:14 AM 123119

L56331-2006231417

Total Dissolved Solids - MWMT

QC List Type: QC-TDS
QCListMatClass: LIQUID
Bench Sheet List: I-TDS
QC Ref: PBW-DUP-LCSW
Group ID: WC-G-MAN-TDS-MWMT
Method Ref: SM2540 C
SOP Ref: SOPWC024

WG489166

ACZ Laboratories, Inc

Instrument ID: WC-MANUAL
Analyst: MLH
ACZ Dept: 37
Create Date: 12/31/2019 16:13
Start Date/Time: 12/31/2019 16:13
End Date/Time: 12/31/2019 16:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	Analysis Date	Initial Weight (g)	Sample Volume (mL)	Final Weight 1 (g)	Final Weight (g)	Amount of Residue (g)	Weight Difference (g)	Weight Check	Total Dissolved Solids (mg/L)	Comments
1	WG489166PBW	NONE	solis prep			12/31/19 16:13	59.4652	50	59.4655				Dry More	6.0000	#904
2	WG489166LCSW	PCN59646	solis prep			12/31/19 16:16	69.111	50	69.1608				Dry More	996.0000	
3	WG488184PBS	NONE	solis prep			12/31/19 16:19	68.6177	50	68.6185				Dry More	16.0000	
4	L56331-01	STSB32_0.5-3	solis prep			12/31/19 16:23	59.8272	25	59.9444				Dry More	4688.0001	
5	L56331-02	STSB32_6-15	solis prep			12/31/19 16:26	48.9964	50	49.1624				Dry More	3319.9999	
6	L56331-03	STSB34_0.5-3	solis prep			12/31/19 16:29	63.8942	50	64.0337				Dry More	2790.0001	
7	L56331-04	STSB34_6-15	solis prep			12/31/19 16:33	60.7391	50	60.9311				Dry More	3840.0000	
8	L56331-04DUP	NONE	solis prep			12/31/19 16:36	55.3337	50	55.5244				Dry More	3813.9999	
9	L56331-05	STSB33_0.5-3	solis prep			12/31/19 16:39	69.9669	50	70.1368				Dry More	3398.0000	
10	L56331-06	STSB33_6-15	solis prep			12/31/19 16:43	67.5698	50	67.6255				Dry More	1114.0000	
11	L56331-07	STSB33-FD_0.5-3	solis prep			12/31/19 16:46	58.4363	50	58.6034				Dry More	3341.9999	
12	L56331-08	STSB35_0.5-3	solis prep			12/31/19 16:49	68.2025	50	68.3701				Dry More	3352.0001	
13	L56331-09	STSB35_6-15	solis prep			12/31/19 16:53	68.7249	25	68.8487				Dry More	4952.0001	
14	WG488413PBS	NONE	solis prep			12/31/19 16:56	69.4154	50	69.4161				Dry More	14.0000	
15	L56452-01	LPT-1	solis prep			12/31/19 16:59	67.5707	50	67.6059				Dry More	704.0000	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56452-01	SJ(2) || quarantined

Report Comments: in 180°C 12:46 1/2/20
out 180°C @ 14:57 L

Internal Comments

AREV: Initials, Date

SREV: Initials, Date

1/2/2020 12:46:21 PM 123119

L56331-2006231417

Total Dissolved Solids - MWMT

QC List Type: QC-TDS
QCListMatClass: LIQUID
Bench Sheet List: I-TDS
QC Ref: PBW-DUP-LCSW
Group ID: WC-G-MAN-TDS-MWMT
Method Ref: SM2540 C
SOP Ref: SOPWC024

WG489166

ACZ Laboratories, Inc

Instrument ID: WC-MANUAL
Analyst: MLH
ACZ Dept: 37
Create Date: 12/31/2019 16:13
Start Date/Time: 12/31/2019 16:13
End Date/Time: 12/31/2019 17:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	Analysis Date	Initial Weight (g)	Sample Volume (mL)	Final Weight 1 (g)	Final Weight (g)	Amount of Residue (g)	Weight Difference (g)	Weight Check	Total Dissolved Solids (mg/L)	Comments
1	WG489166PBW	NONE	solis prep			12/31/19 16:13	59.4652	50					Dry More		#904
2	WG489166LCSW	PCN59646	solis prep			12/31/19 16:16	69.111	50					Dry More		
3	WG488184PBS	NONE	solis prep			12/31/19 16:19	68.6177	50					Dry More		
4	L56331-01	STSB32_0.5-3	solis prep			12/31/19 16:23	59.8272	~~50~~ 25					Dry More		
5	L56331-02	STSB32_6-15	solis prep			12/31/19 16:26	48.9964	50					Dry More		
6	L56331-03	STSB34_0.5-3	solis prep			12/31/19 16:29	63.8942	50					Dry More		
7	L56331-04	STSB34_6-15	solis prep			12/31/19 16:33	60.7391	50					Dry More		
8	L56331-04DUP	NONE	solis prep			12/31/19 16:36	55.3337	50					Dry More		
9	L56331-05	STSB33_0.5-3	solis prep			12/31/19 16:39	69.9669	50					Dry More		
10	L56331-06	STSB33_6-15	solis prep			12/31/19 16:43	67.5698	50					Dry More		
11	L56331-07	STSB33-FD_0.5-3	solis prep			12/31/19 16:46	58.4363	50					Dry More		
12	L56331-08	STSB35_0.5-3	solis prep			12/31/19 16:49	68.2025	50					Dry More		
13	L56331-09	STSB35_6-15	solis prep			12/31/19 16:53	68.7249	~~50~~ 25					Dry More		
14	WG488413PBS	NONE	solis prep			12/31/19 16:56	69.4154	50					Dry More		
15	L56452-01	LPT-1	solis prep			12/31/19 16:59	67.5707	50					Dry More		

MLH 12/31/19

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56452-01	SJ(2) || quarantined

Report Comments: placed in 85degree oven instead of 105 Yamato - MLH 12/31/19
in 85.4 @ 17:00 on 12/31/19

Internal Comments but 81.4°C, ∅ in 180°C @ 8:27 1/2/20
and 180°C 1/2/20 @ 9:27 1/2/20

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/31/2019 4:19:09 PM 123119

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG489166

Date Reported: 08-Jan-20
Run ID: R1766270
Date Analyzed: 31-Dec-19
ICAL Workgroup:
Instrument ID: WC-MANUAL

WG489166PBW

Tag: **Measured:** 12/31/2019 4:13:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	TOTAL DISSOLVED SOLIDS	FOUND		1	U ✓	mg/L	++	20	40			
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					
SREV	WEIGHT CHECK	TEXT		1			++			Pass		
SREV	WEIGHT DIFFERENCE	PREP	0.0003	1		g	++					
SREV	WEIGHT, FINAL	PREP	59.4652	1		g	++					
SREV	WEIGHT, FINAL1	PREP	59.4655	1		g	++					
SREV	WEIGHT, INITIAL	PREP	59.4652	1		g	++					

WG489166LCSW

Tag: **Measured:** 12/31/2019 4:16:21 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	TOTAL DISSOLVED SOLIDS	FOUND	1000 ✓	1		mg/L	++	20	40			
SREV	TOTAL DISSOLVED SOLIDS	REC	100	1		%	++	20	40			
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					
SREV	WEIGHT CHECK	TEXT		1			++			Pass		
SREV	WEIGHT DIFFERENCE	PREP	0.0002	1		g	++					
SREV	WEIGHT, FINAL	PREP	69.161	1		g	++					
SREV	WEIGHT, FINAL1	PREP	69.1608	1		g	++					
SREV	WEIGHT, INITIAL	PREP	69.111	1		g	++					

WG488184PBS

Tag: 1 **Measured:** 12/31/2019 4:19:42 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	TOTAL DISSOLVED SOLIDS	FOUND	24 ✓	1	B	mg/L	++	20	40	5x = 120		
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					
SREV	WEIGHT CHECK	TEXT		1			++			Pass		
SREV	WEIGHT DIFFERENCE	PREP	0.0004	1		g	++					
SREV	WEIGHT, FINAL	PREP	68.6189	1		g	++					
SREV	WEIGHT, FINAL1	PREP	68.6185	1		g	++					
SREV	WEIGHT, INITIAL	PREP	68.6177	1		g	++					

~~L56331-01~~

Tag: 1 **Measured:** 12/31/2019 4:23:03 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.1158	2		g	++				TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	4630	2	H	mg/L	++	40	80		H2 TB	
NEED	VOLUME, SAMPLE	PREP	25	2		mL	++				TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TB	
NEED	WEIGHT DIFFERENCE	PREP	0.0001	2		g	++				TB	
NEED	WEIGHT, FINAL	PREP	59.943	2		g	++				TB	
NEED	WEIGHT, FINAL1	PREP	59.9431	2		g	++				TB	
NEED	WEIGHT, INITIAL	PREP	59.8272	2		g	++				TB	

L56331-02

Tag: 1 Measured: 12/31/2019 4:26:24 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.1645	1		g	++				TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	3290	1	H	mg/L	++	20	40		HC TB	
NEED	VOLUME, SAMPLE	PREP	50	1		mL	++				TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TB	
NEED	WEIGHT DIFFERENCE	PREP	0	1		g	++				TB	
NEED	WEIGHT, FINAL	PREP	49.1609	1		g	++				TB	
NEED	WEIGHT, FINAL1	PREP	49.1609	1		g	++				TB	
NEED	WEIGHT, INITIAL	PREP	48.9964	1		g	++				TB	

L56331-03

Tag: 1 Measured: 12/31/2019 4:29:45 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.1391	1		g	++				TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	2780	1	H	mg/L	++	20	40		HC TB	
NEED	VOLUME, SAMPLE	PREP	50	1		mL	++				TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TB	
NEED	WEIGHT DIFFERENCE	PREP	0.0004	1		g	++				TB	
NEED	WEIGHT, FINAL	PREP	64.0333	1		g	++				TB	
NEED	WEIGHT, FINAL1	PREP	64.0337	1		g	++				TB	
NEED	WEIGHT, INITIAL	PREP	63.8942	1		g	++				TB	

L56331-04

Tag: 1 Measured: 12/31/2019 4:33:06 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.1903	1		g	++				TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	3810	1	H	mg/L	++	20	40		HC TB	
NEED	VOLUME, SAMPLE	PREP	50	1		mL	++				TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TB	
NEED	WEIGHT DIFFERENCE	PREP	0.0002	1		g	++				TB	
NEED	WEIGHT, FINAL	PREP	60.9294	1		g	++				TB	
NEED	WEIGHT, FINAL1	PREP	60.9296	1		g	++				TB	
NEED	WEIGHT, INITIAL	PREP	60.7391	1		g	++				TB	

L56331-04DUP

Tag: Measured: 12/31/2019 4:36:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	TOTAL DISSOLVED SOLIDS	FOUND	3770	1		mg/L	++	20	40			
SREV	TOTAL DISSOLVED SOLIDS	RPD	1	1		%	++	20	40			
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					
SREV	WEIGHT CHECK	TEXT		1			++			Pass		
SREV	WEIGHT DIFFERENCE	PREP	0.0001	1		g	++					
SREV	WEIGHT, FINAL	PREP	55.5221	1		g	++					
SREV	WEIGHT, FINAL1	PREP	55.5222	1		g	++					
SREV	WEIGHT, INITIAL	PREP	55.3337	1		g	++					

L56331-05

Tag: 1 Measured: 12/31/2019 4:39:48 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.1695	1		g	++				TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	3390	1	H	mg/L	++	20	40		HC TB	
NEED	VOLUME, SAMPLE	PREP	50	1		mL	++				TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TB	
NEED	WEIGHT DIFFERENCE	PREP	0.0004	1		g	++				TB	
NEED	WEIGHT, FINAL	PREP	70.1364	1		g	++				TB	
NEED	WEIGHT, FINAL1	PREP	70.1368	1		g	++				TB	
NEED	WEIGHT, INITIAL	PREP	69.9669	1		g	++				TB	

L56331-06

Tag: 1 Measured: 12/31/2019 4:43:09 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.0556	1		g	++				TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	1110	1	H	mg/L	++	20	40		HC TB	
NEED	VOLUME, SAMPLE	PREP	50	1		mL	++				TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TB	
NEED	WEIGHT DIFFERENCE	PREP	0.0001	1		g	++				TB	
NEED	WEIGHT, FINAL	PREP	67.6254	1		g	++				TB	
NEED	WEIGHT, FINAL1	PREP	67.6255	1		g	++				TB	
NEED	WEIGHT, INITIAL	PREP	67.5698	1		g	++				TB	

L56331-07

Tag: 1 Measured: 12/31/2019 4:46:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.1656	1		g	++				TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	3310	1	H	mg/L	++	20	40		HC TB	
NEED	VOLUME, SAMPLE	PREP	50	1		mL	++				TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TB	
NEED	WEIGHT DIFFERENCE	PREP	0.0001	1		g	++				TB	
NEED	WEIGHT, FINAL	PREP	58.6019	1		g	++				TB	
NEED	WEIGHT, FINAL1	PREP	58.602	1		g	++				TB	
NEED	WEIGHT, INITIAL	PREP	58.4363	1		g	++				TB	

L56331-08

Tag: 1 Measured: 12/31/2019 4:49:51 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.1663	1		g	++				TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	3330	1	H	mg/L	++	20	40		HC TB	
NEED	VOLUME, SAMPLE	PREP	50	1		mL	++				TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TB	
NEED	WEIGHT DIFFERENCE	PREP	0.0003	1		g	++				TB	
NEED	WEIGHT, FINAL	PREP	68.3688	1		g	++				TB	
NEED	WEIGHT, FINAL1	PREP	68.3691	1		g	++				TB	
NEED	WEIGHT, INITIAL	PREP	68.2025	1		g	++				TB	

L56331-09 Tag: 1 Measured: 12/31/2019 4:53:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.1227	2		g	++				TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	4910	2	H	mg/L	++	40	80		H2 TB	
NEED	VOLUME, SAMPLE	PREP	25	2		mL	++				TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TB	
NEED	WEIGHT DIFFERENCE	PREP	0	2		g	++				TB	
NEED	WEIGHT, FINAL	PREP	68.8476	2		g	++				TB	
NEED	WEIGHT, FINAL1	PREP	68.8476	2		g	++				TB	
NEED	WEIGHT, INITIAL	PREP	68.7249	2		g	++				TB	

WG488413PBS Tag: 1 Measured: 12/31/2019 4:56:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	TOTAL DISSOLVED SOLIDS	FOUND		1	U	mg/L	++	20	40			
SREV	VOLUME, SAMPLE	PREP	50	1		mL	++					
SREV	WEIGHT CHECK	TEXT		1			++			Pass		
SREV	WEIGHT DIFFERENCE	PREP	0	1		g	++					
SREV	WEIGHT, FINAL	PREP	69.4161	1		g	++					
SREV	WEIGHT, FINAL1	PREP	69.4161	1		g	++					
SREV	WEIGHT, INITIAL	PREP	69.4154	1		g	++					

L56452-01 Tag: 1 Measured: 12/31/2019 4:59:54 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
NEED	AMOUNT OF RESIDUE	PREP	0.0353	1		g	++				TA TB	
SREV	TOTAL DISSOLVED SOLIDS	S-MWMT	706	1	H	mg/L	++	20	40		HC TA TB	
NEED	VOLUME, SAMPLE	PREP	50	1		mL	++				TA TB	
NEED	WEIGHT CHECK	TEXT		1			+			Pass	TA TB	
NEED	WEIGHT DIFFERENCE	PREP	0.0001	1		g	++				TA TB	
NEED	WEIGHT, FINAL	PREP	67.606	1		g	++				TA TB	
NEED	WEIGHT, FINAL1	PREP	67.6059	1		g	++				TA TB	
NEED	WEIGHT, INITIAL	PREP	67.5707	1		g	++				TA TB	

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489166 **Total Dissolved Solids - MWMT**

Sample	Date	SCN	AL DISSOLVED SO	WEIGHT CHECK
WG489166PBW	12/31/19 16:13		X	X
WG489166LCSW	12/31/19 16:16	PCN59646	X	X
WG488184PBS	12/31/19 16:19		X	X
L56331-01	12/31/19 16:23		X	
L56331-02	12/31/19 16:26		X	
L56331-03	12/31/19 16:29		X	
L56331-04	12/31/19 16:33		X	
L56331-04DUP	12/31/19 16:36		X	X
L56331-05	12/31/19 16:39		X	
L56331-06	12/31/19 16:43		X	
L56331-07	12/31/19 16:46		X	
L56331-08	12/31/19 16:49		X	
L56331-09	12/31/19 16:53		X	
WG488413PBS	12/31/19 16:56		X	X
L56452-01	12/31/19 16:59		X	

ACZ Laboratories, Inc

FLUORIDE

QC List Type: QC-F
QCListMatClass: LIQUID
Bench Sheet List: I-F
QC Ref: WC-F
Group ID: WC-G-MNP-F
Method Ref: SM4500-F C
SOP Ref: SOPWC060

WG489301

Instrument ID: MANIP1
Analyst: EMK
ACZ Dept: 37
Create Date: 01/03/2020 8:53
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	AL	FE	F		Dilution	Comments
1	WG489301ICV	WC191231-1					☑		1	
2	WG489301ICB	NONE					☑		1	
3	WG489301PQV	WC200102-7					☑		1	
4	WG489301LFB1	WC191014-1					☑		1	
5	L56495-01	ROBERTSON WELL				0.21*	☑		1	
6	L56495-01AS	WC191014-1					☑		1	
7	L56495-01ASD	WC191014-1					☑		1	
8	L56512-01	POCW-01					☑		1	
9	L56515-01	POCW-02					☑		1	
10	L56515-02	DUP01					☑		1	
11	L56596-01	MW-2B					☑		+20	F
12	L56596-02	MW-5B					☑		+2	F
13	L56596-03	MW-6					☑		~~+100x~~ 200	F/DL
14	WG489301CCV1	WC191231-1					☑	EMK	1	
15	WG489301CCB1	NONE					☑	1/3/20	1 400	
16	L56596-04	MW-19					☑		~~+200~~	F/DL
17	L56596-05	MW-20					☑		+ 8	DL
18	L56596-06	WR-MAG					☑		+ 1	
19	L56596-07	MW-7					☑		+ 25	DL
20	L56596-07AS	WC191014-1					☑		+ 1	1
21	L56596-07ASD	WC191014-1					☑		+ 1	1
22	L56596-08	MW-15					☑		+ 20	F
23	L56618-08	AKG191060			*	2.03*	☑		1	
24	L56618-09	AKG191061			*	0.86*	☑		1	

Report Comments:

Internal Comments

AREV: EMK 1/3/20
Initials, Date

SREV: ENB 1/3/20
Initials, Date

1/3/2020 8:54:29 AM 123119

FLUORIDE

QC List Type: QC-F
QCListMatClass: LIQUID
Bench Sheet List: I-F
QC Ref: WC-F
Group ID: WC-G-MNP-F
Method Ref: SM4500-F C
SOP Ref: SOPWC060

WG489301

ACZ Laboratories, Inc

Instrument ID: MANIP1
Analyst:
ACZ Dept: 37
Create Date: 01/03/2020 8:53
Start Date/Time:
End Date/Time:

SE Q	ACZ ID	Client ID	SubSX	Pri	AL	FE	F	Dilution	Comments
25	L56618-10	AKG191063			*	0.27*	✓	1	
26	WG489301CCV2	WC191231-1					✓	1	
27	WG489301CCB2	NONE					✓	1	
28	L56618-11	AKG191064			*	*	✓	1	
29	L56618-12	AKG191065					✓	1	
30	L56618-13	AKG191074				0.09	✓	1	
31	L56618-14	AKG191075			0.08	0.04*	✓	1	
32	L56618-15	AKG191076					✓	1	
33	WG489301LFB2	WC191014-1					✓	1	
34	L56618-16	AKG191077					✓	1	
35	L56618-16AS	WC191014-1					✓	1	
36	L56618-16ASD	WC191014-1					✓	1	
37	L56618-17	AKG191078					✓	1	
38	WG489301CCV3	WC191231-1					✓	1	
39	WG489301CCB3	NONE					✓	1	
40	L56618-18	AKG191079				0.27	✓	1	
41	L56618-19	AKG191080				0.77*	✓	1	
42	L56618-20	AKG191081				0.34	✓	1	
43	L56618-21	AKG191082				0.46	✓	1	
44	L56618-22	AKG191084				0.05*	✓	1	
45	L56618-23	AKG191085				2.68*	✓	1	
46	L56618-24	AKG191086				1.69*	✓	1	
47	L56618-25	AKG191087					✓	1	
48	WG489301CCV4	WC191231-1					✓	1	

Report Comments:

Internal Comments

AREV:
Initials, Date

SREV:
Initials, Date

1/3/2020 8:54:31 AM 123119

FLUORIDE

QC List Type: QC-F
QCListMatClass: LIQUID
Bench Sheet List: I-F
QC Ref: WC-F
Group ID: WC-G-MNP-F
Method Ref: SM4500-F C
SOP Ref: SOPWC060

WG489301

ACZ Laboratories, Inc

Instrument ID: MANIP1
Analyst:
ACZ Dept: 37
Create Date: 01/03/2020 8:53
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	AL	FE	F	Dilution	Comments
49	WG489301CCB4	NONE					☑	1	

Report Comments:

Internal Comments

AREV:
Initials, Date

SREV:
Initials, Date

1/3/2020 8:54:32 AM 123119

FLUORIDE

QC List Type: QC-F
QCListMatClass: LIQUID
Bench Sheet List: I-F
QC Ref: WC-F
Group ID: WC-G-MNP-F
Method Ref: SM4500-F C
SOP Ref: SOPWC060

WG489301

ACZ Laboratories, Inc

Instrument ID: MANIP1
Analyst:
ACZ Dept: 37
Create Date: 01/03/2020 8:53
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56495-01	GCBFA,GRADFA,U,WF,GPCFA,VLUP(3) ||
L56512-01	RCB,RedRad,U,W,GPC,VLP(3),VLUP(6) || RCB,RedRad,U,W,GPC,VLP(3),VLUP(6) ||
L56515-01	RCB,RedRad,U,W,GPC,VLP(3),VLUP(6) ||
L56515-02	RCB,RedRad,U,W,GPC,VLP(3),VLUP(6) ||
L56596-01	RCB,U,W,GPC,VLP(3) || RCB,U,W,GPC,VLP(3) ||
L56596-02	RCB,U,W,GPC,VLP(3) || RCB,U,W,GPC,VLP(3) ||
L56596-03	RCB,U,W,GPC,VLP(3) || RCB,U,W,GPC,VLP(3) ||
L56596-04	RCB,U,W,GPC,VLP(3) || RCB,U,W,GPC,VLP(3) ||
L56596-05	RCB,U,W,G,VLP(3) || RCB,U,W,GPC,VLP(3) ||
L56596-06	U,WF,RPC ||
L56596-07	RedRad,U,W,RPC,G ||
L56596-08	RedRad,U,W,RPC,G || RedRad,U,W,RPC,G ||
L56618-08	P,U,W,RPC,GPC,Y,T ||
L56618-09	P,U,W,RPC,GPC,Y,T ||
L56618-10	P,U,W,RPC,GPC,Y,T ||
L56618-11	P,U,W,RPC,GPC,Y,T ||
L56618-12	P,U,W,RPC,GPC,Y,T ||
L56618-13	P,U,W,RPC,GPC,Y,T ||
L56618-14	P,U,W,RPC,GPC,Y,T ||
L56618-15	P,U,W,RPC,GPC,Y,T ||
L56618-16	P,U,W,RPC,GPC,Y,T ||
L56618-17	P,U,W,RPC,GPC,Y,T || P,U,W,RPC,GPC,Y,T ||
L56618-18	P,U,W,RPC,GPC,Y,T || P,U,W,RPC,GPC,Y,T ||
L56618-19	P,U,W,RPC,GPC,Y,T || P,U,W,RPC,GPC,Y,T ||
L56618-20	P,U,W,RPC,GPC,Y,T || P,U,W,RPC,GPC,Y,T ||
L56618-21	P,U,W,RPC,GPC,Y,T || P,U,W,RPC,GPC,Y,T ||
L56618-22	P,U,W,RPC,GPC,Y,T || P,U,W,RPC,GPC,Y,T ||
L56618-23	P,U,W,RPC,GPC,Y,T || P,U,W,RPC,GPC,Y,T ||
L56618-24	P,U,W,RPC,GPC,Y,T || P,U,W,RPC,GPC,Y,T ||
L56618-25	P,U,W,RPC,GPC,Y,T || P,U,W,RPC,GPC,Y,T ||

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/3/2020 8:54:32 AM 123119

ACZ Laboratories, Inc.
AUTO TITRATOR DATA REVIEW CHECKLIST

AREV: EMK
Date: 1/3/20

SREV: ENR
Date: 1/3/20

Work Group: 489301
Sample Type: F
Analysis Date: 1/3/20
Analyst: EMK

Instrument ID: Manip 1

	Yes	No	N/A
1.) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓✓		
2.) Are all of the QC critera listed in LIMS within specified acceptance limits?		✓✓	
3.) **pH ONLY:** Is the difference between the 2 replicates of each sample < 0.1 ?			✓✓
4.) If new acid was prepared, was it standardized? (Attach standardization report.)			✓✓
5.) **Alk, EC, pH:** All analyses performed on an unaltered sample (not centrifuged, diluted, etc.) *			✓✓
6.) **Fluoride:** Is any sample analyzed on dilution appropriately "D" qualified (except o-cal)?			✓✓
7.) **Fluoride only**: Were all sx's checked with TISAB?	✓✓		
8.) Were all samples run within hold time (other than pH)? Flag if "No."	✓✓		
9.) Is a current standard/reagent sheet attached to the workgroup?	✓✓		
10.) **EC ONLY**:Is the meter calibration reading within acceptable limits (1271.7-1554.3)?			✓✓
11.) **For WG's containing DW samples**: PQV included for F-, Alk, & EC as applicable?	✓✓		
12.) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? —

Calibration WG: 489301 ✓

Slope (Fluoride only) -59.506 ✓

Normality H2SO4 for ALK: —

Disposable Vessel Lot**: 1906257 ✓

For any item listed above that is checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
596-07 AS/D	low Recovery	M2 ✓
6198-16AS	↓	MA ✓

Comments:

* If no, qualify data with ZW. Altering the sample is a modification to the method.

** Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

FRMWC014.10.13.16

PC-TitratION PLUS

Calibration Report

Calibration Record # 3585

Calibration Settings

Calibration ID	FLUORIDE	Date	1/3/2020
Channel	2	Time	8:45 AM
Probe Type	ISE	Temperature	-999.00 K -1272.15 C
Probe ID	F ELECTRODE	Analysis Type	Multi Line Fit

Operator

Calibration Results

Standard	Replicate	Set	Reading	Equation	Correlation
1	1	.25	187.98		
2	1	1.00	150.87	y = -61.638 x + 150.870	1.00
3	1	5.00	107.54	y = -61.991 x + 150.870	1.00
4	1	10.00	88.74	y = -62.452 x + 151.192	1.00
5	1	20.00	70.55	y = -60.426 x + 149.166	1.00
6	1	50.00	46.87	y = -59.506 x + 147.970	1.00

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Parameter: Fluoride Instr: ISE

	REAGENT	PCN/SCN	EXPIRATION DATE
Reagents:	TISAB	PCN60284	10/31/2021

FLUORIDE

QC List Type: QC-F
QCListMatClass: LIQUID
Bench Sheet List: I-F-MWMT
QC Ref: WC-F-SOIL
Group ID: WC-G-MNP-APCF-MWMT
Method Ref: SM4500-F C
SOP Ref: SOPWC060

WG489345

ACZ Laboratories, Inc

Instrument ID: MANIP1
Analyst: EMK
ACZ Dept: 37
Create Date: 01/03/2020 12:58
Start Date/Time:
End Date/Time:

Final

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	AL	FE	FMWMT	Comments
1	WG489345ICV	WC191231-1			1			✓	
2	WG489345ICB	NONE			1			✓	
3	WG489345PQV	WC200102-7			1			✓	
4	WG489345LFB	WC191014-1			1			✓	Made w/184PBS
5	WG488184PBS	NONE			1			✓	
6	L56331-01	STSB32_0.5-3			30	27.8	5.04*	✓	
7	L56331-01AS	WC191014-1			1			✓	
8	L56331-01ASD	WC191014-1			1			✓	
9	L56331-02	STSB32_6-15			6	5.67		✓	
10	L56331-03	STSB34_0.5-3			5	4.32	0.06	✓	
11	L56331-04	STSB34_6-15			20	16.4		✓	
12	L56331-05	STSB33_0.5-3			30	27.5	0.17	✓	
13	L56331-06	STSB33_6-15			1			✓	30 entered into program, text file updated as a 1x dilution F=3.28 ✓ EMK 1/6/20
14	L56331-07	STSB33-FD_0.5-3			25	22.5	0.12	✓	
15	L56331-08	STSB35_0.5-3			20	19.8	0.59*	✓	
16	L56331-09	STSB35_6-15			50	48.1	3.34*	✓	
17	WG488413PBS	NONE			1			✓	
18	L56452-01	LPT-1			1		0.08	✓	
19	WG488496PBS	NONE			1			✓	
20	WG489345CCV1	WC191231-1			1			✓	
21	WG489345CCB1	NONE			1			✓	
22	L56453-01	STSB05_0.5-3			20	18.6	0.25	✓	Acdor after w/ TISAB

Report Comments: Cal WG489301 .59.506
All SXS DL

Internal Comments

AREV: EMK 1/6/20
Initials, Date

SREV: ENB 1/6/20
Initials, Date

1/3/2020 12:58:42 PM 123119

FLUORIDE

QC List Type: QC-F
QCListMatClass: LIQUID
Bench Sheet List: I-F-MWMT
QC Ref: WC-F-SOIL
Group ID: WC-G-MNP-APCF-MWMT
Method Ref: SM4500-F C
SOP Ref: SOPWC060

WG489345

ACZ Laboratories, Inc

Instrument ID: MANIP1
Analyst:
ACZ Dept: 37
Create Date: 01/03/2020 12:58
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	AL	FE	FMWMT	Comments
						EMK 1/3/20			
23	L56453-01AS	WC191014-1			20	~~20~~		✓	
24	L56453-01ASD	WC191014-1			1			✓	
25	L56453-02	STSB05_6-15			15	14.5	11.5*	✓	
26	L56453-03	STSB05_45-55			1			✓	
27	L56453-04	STSB05_66-71			1			✓	
28	L56453-05	STSB05_76-81			1			✓	
29	L56453-06	STSB06_0.5-3			1		0.05	✓	
30	WG489345CCV2	WC191231-1			1			✓	
31	WG489345CCB2	NONE			1			✓	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56452-01	SJ(2) || quarantined
L56453-01	BUCKET ||
L56453-02	BUCKET ||
L56453-03	BUCKET ||
L56453-04	BUCKET ||
L56453-05	BUCKET ||
L56453-06	BUCKET ||

Report Comments:

Internal Comments

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/3/2020 12:58:43 PM 123119

ACZ Laboratories, Inc.

AUTO TITRATOR DATA REVIEW CHECKLIST

AREV: EMK
Date: 1/6/20 EMK 1/6/20

SREV: ENB
Date: 1/6/20

Work Group: 489345
Sample Type: FMWMT
Analysis Date: 1/3/20
Analyst: EMK

Instrument ID: Manip 1

	Yes	No	N/A
1.) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓✓		
2.) Are all of the QC critera listed in LIMS within specified acceptance limits?		✓✓	
3.) **pH ONLY:** Is the difference between the 2 replicates of each sample < 0.1 ?			✓✓
4.) If new acid was prepared, was it standardized? (Attach standardization report.)			✓✓
5.) **Alk, EC, pH:** All analyses performed on an unaltered sample (not centrifuged, diluted, etc.) *			✓✓
6.) **Fluoride:** Is any sample analyzed on dilution appropriately "D" qualified (except o-cal)?			✓✓
7.) **Fluoride only**: Were all sx's checked with TISAB?	✓✓		
8.) Were all samples run within hold time (other than pH)? Flag if "No."	✓✓		
9.) Is a current standard/reagent sheet attached to the workgroup? EMK 1/6/20	✓✓		
10.) **EC ONLY**:Is the meter calibration reading within acceptable limits (1271.7-1554.3)?			✓✓
11.) **For WG's containing DW samples**: PQV included for F-, Alk, & EC as applicable?	✓✓		
12.) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? Yes ✓ Calibration WG: 489301 ✓

Slope (Fluoride only) -59.506 ✓ Normality H2SO4 for ALK: –

Disposable Vessel Lot**: 1906257 ✓

For any item listed above that is checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
331-01 AS/D	low Recovery	M2 ✓
453-01 AS/D	2	Redo ASSC SXS ✓
CCV2	High Recovery	1 ✓
~~453-01-06~~	EMK 1/6/20	

Comments:
453-01-06 Wong MWMT Analysis entered. Original WG fixed, SXS going to Redo for FMWMT

* If no, qualify data with ZW. Altering the sample is a modification to the method.

** Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG489345

Date Reported: 06-Jan-20
Run ID: R1766654
Date Analyzed: 03-Jan-20
ICAL Workgroup: WG489301
Instrument ID: MANIP1

WG489345ICV

Tag: Measured: 1/3/2020 3:23:26 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND	2.08 ✓	1		mg/L	++	0.1	0.4			
SREV	FLUORIDE	REC	104	1		%	++	0.1	0.4			

WG489345ICB

Tag: Measured: 1/3/2020 3:29:17 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND		1	U ✓	mg/L	++	0.1	0.4			

WG489345PQV

Tag: Measured: 1/3/2020 3:33:07 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND	0.39 ✓	1	B	mg/L	++	0.1	0.4			
SREV	FLUORIDE	REC	111	1	B	%	++	0.1	0.4			

WG489345LFB

Tag: Measured: 1/3/2020 3:36:50 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND	5.14 ✓	1		mg/L	++	0.1	0.4			
SREV	FLUORIDE	REC	103	1		%	++	0.1	0.4			

WG488184PBS

Tag: 1 Measured: 1/3/2020 3:41:47 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND	0.15 ✓	1	B	mg/L	++	0.1	0.4	5x = 0.75		

L56331-01

Tag: 1 Measured: 1/3/2020 3:49:40 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	16	30		mg/L	++	3	10		M2 TB	

L56331-01AS

Tag: 1 Measured: 1/3/2020 3:57:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND	136.4 ✓	30		mg/L	++	3	10			
SREV	FLUORIDE	REC	80	30		%	ALRT	3	10		M2	75-125

L56331-01ASD

Tag: 1 Measured: 1/3/2020 4:04:53 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND	144	30		mg/L	++	3	0			75-125
SREV	FLUORIDE	REC	85 ✓	30		%	ALRT	3	0		M2	
SREV	FLUORIDE	RPD	5	30		%	++	3	0			

L56331-02 Tag: 1 Measured: 1/3/2020 4:10:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	11.7	6		mg/L	++	0.7	2		M2 TB	

L56331-03 Tag: 1 Measured: 1/3/2020 4:17:53 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	4.4	5		mg/L	++	0.6	2		M2 TB	

L56331-04 Tag: 1 Measured: 1/3/2020 4:23:38 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	25	20		mg/L	++	2	7		M2 TB	

L56331-05 Tag: 1 Measured: 1/3/2020 4:31:32 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	18	30		mg/L	++	3	10		M2 TB	

L56331-06 Tag: 1 Measured: 1/3/2020 4:38:16 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	3.3	1		mg/L	++	0.1	0.4		M2 TB	

L56331-07 Tag: 1 Measured: 1/3/2020 4:46:10 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	17	25		mg/L	++	3	9		M2 TB	

L56331-08 Tag: 1 Measured: 1/3/2020 4:54:04 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	11	20		mg/L	++	2	7		M2 TB	

L56331-09 Tag: 1 Measured: 1/3/2020 5:01:57 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	25	50		mg/L	++	6	20		M2 TB	

WG488413PBS Tag: Measured: 1/3/2020 5:09:50 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND		1	U	mg/L	++	0.1	0.4			

L56452-01 Tag: Measured: 1/3/2020 5:17:44 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	F-MWMT	2.6	1		mg/L	++	0.1	0.4		M2 TA TB	

WG488496PBS Tag: Measured: 1/3/2020 5:21:34 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	FLUORIDE	FOUND	0.23	1	B	mg/L	++	0.1	0.4			

WG489345CCV1

Tag: Measured: 1/3/2020 5:25:37 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND	2.11 ✓	1		mg/L	++	0.1	0.4			
SREV	FLUORIDE	REC	105	1		%	++	0.1	0.4			

WG489345CCB1

Tag: Measured: 1/3/2020 5:30:35 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND		1	U ✓	mg/L	++	0.1	0.4			

L56453-01

Tag: Measured: 1/3/2020 5:36:53 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	FLUORIDE	REG	9	20	H	mg/L	++	2	7		TA TB	

L56453-01AS

Tag: Measured: 1/3/2020 5:44:47 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	FLUORIDE	FOUND	89.3	20		mg/L	++	2	7			
FAIL	FLUORIDE	REC	80	20		%	ALRT	2	7			

L56453-01ASD

Tag: Measured: 1/3/2020 5:51:01 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	FLUORIDE	FOUND	96.9	20		mg/L	++	2	0			
FAIL	FLUORIDE	REC	88	20		%	ALRT	2	0			
FAIL	FLUORIDE	RPD	8	20		%	++	2	0			

L56453-02

Tag: Measured: 1/3/2020 5:56:46 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	FLUORIDE	REG	13	15	H	mg/L	++	2	5		TA TB	

L56453-03

Tag: Measured: 1/3/2020 6:00:52 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	FLUORIDE	REG	1.9	1	H	mg/L	++	0.1	0.4		TA TB	

L56453-04

Tag: Measured: 1/3/2020 6:06:59 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	FLUORIDE	REG	6.7	1	H	mg/L	++	0.1	0.4		TA TB	

L56453-05

Tag: Measured: 1/3/2020 6:11:42 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	FLUORIDE	REG	5.1	1	H	mg/L	++	0.1	0.4		TA TB	

L56453-06

Tag: Measured: 1/3/2020 6:19:36 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	FLUORIDE	REG	6.4	1	H	mg/L	++	0.1	0.4		TA TB	

WG489345CCV2

Tag:

Measured: 1/3/2020 6:27:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	FLUORIDE	FOUND	2.61	1		mg/L	++	0.1	0.4			
FAIL	FLUORIDE	REC	130	1		%	ALRT	0.1	0.4			

WG489345CCB2

Tag:

Measured: 1/3/2020 6:35:24 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	FLUORIDE	FOUND	0.29	1	B	mg/L	++	0.1	0.4			

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489345 **FLUORIDE**

Sample	Date	SCN	F
WG489345ICV	01/03/20 15:23	WC191231-1	X
WG489345ICB	01/03/20 15:29		X
WG489345PQV	01/03/20 15:33	WC200102-7	X
WG489345LFB	01/03/20 15:36	WC191014-1	X
WG488184PBS	01/03/20 15:41		X
L56331-01	01/03/20 15:49		X
L56331-01AS	01/03/20 15:57	WC191014-1	X
L56331-01ASD	01/03/20 16:04	WC191014-1	X
L56331-02	01/03/20 16:10		X
L56331-03	01/03/20 16:17		X
L56331-04	01/03/20 16:23		X
L56331-05	01/03/20 16:31		X
L56331-06	01/03/20 16:38		X
L56331-07	01/03/20 16:46		X
L56331-08	01/03/20 16:54		X
L56331-09	01/03/20 17:01		X
WG488413PBS	01/03/20 17:09		X
L56452-01	01/03/20 17:17		X
WG488496PBS	01/03/20 17:21		X
WG489345CCV1	01/03/20 17:25	WC191231-1	X
WG489345CCB1	01/03/20 17:30		X
L56453-01	01/03/20 17:36		
L56453-01AS	01/03/20 17:44	WC191014-1	X
L56453-01ASD	01/03/20 17:51	WC191014-1	X
L56453-02	01/03/20 17:56		
L56453-03	01/03/20 18:00		

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489345 **FLUORIDE**

Sample	Date	SCN	F
L56453-04	01/03/20 18:06		
L56453-05	01/03/20 18:11		
L56453-06	01/03/20 18:19		
WG489345CCV2	01/03/20 18:27	WC191231-1	X
WG489345CCB2	01/03/20 18:35		X

L56331-2006231417

PHALKCON

QC List Type: QC-ALK-200
QCListMatClass: LIQUID
Bench Sheet List: I-PH
QC Ref: WC-MANIP
Group ID: WC-G-MNP-PHALKONMW
Method Ref: PHALKCON
SOP Ref: SOPWC078

WG488883

ACZ Laboratories, Inc

Instrument ID: MANIP2
Analyst: ENB
ACZ Dept: 37
Create Date: 12/27/2019 8:57
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	ALKMWMT	Comments
1	WG488883PBW	NONE				✓	
2	WG488883LCSW1	WC191226-5				✓	
3	WG488184PBS	NONE				✓	
4	L56331-01	STSB32_0.5-3				✓	
5	L56331-02	STSB32_6-15				✓	
6	L56331-03	STSB34_0.5-3				✓	
7	L56331-04	STSB34_6-15				✓	
8	L56331-05	STSB33_0.5-3				✓	
9	L56331-06	STSB33_6-15				✓	
10	L56331-07	STSB33-FD_0.5-3				✓	
11	L56331-08	STSB35_0.5-3				✓	
12	L56331-09	STSB35_6-15				✓	
13	L56331-09DUP	NONE				✓	WC
14	WG488413PBS	NONE				✓	
15	L56452-01	LPT-1				✓	
16	WG488496PBS	NONE				✓	
17	L56453-01	STSB05_0.5-3				✓	
18	L56453-02	STSB05_6-15				✓	
19	L56453-03	STSB05_45-55				✓	
20	L56453-04	STSB05_66-71				✓	
21	L56453-05	STSB05_76-81				✓	
22	L56453-06	STSB06_0.5-3				✓	

Report Comments: Cal WG488881

Internal Comments

AREV: ENB 12/30/19
Initials, Date

SREV: EMK 12/30/19
Initials, Date

12/27/2019 8:58:10 AM 123119

L56331-2006231417

PHALKCON

QC List Type: QC-ALK-200
QCListMatClass: LIQUID
Bench Sheet List: I-PH
QC Ref: WC-MANIP
Group ID: WC-G-MNP-PHALKONMW
Method Ref: PHALKCON
SOP Ref: SOPWC078

WG488883

ACZ Laboratories, Inc

Instrument ID: MANIP2
Analyst:
ACZ Dept: 37
Create Date: 12/27/2019 8:57
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	ALK MW MT	Comments
23	L56453-06DUP	NONE				☑	WC
24	WG488883LCSW2	WC191226-5				☑	

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56452-01	SJ(2) || quarantined
L56453-01	BUCKET ||
L56453-02	BUCKET ||
L56453-03	BUCKET ||
L56453-04	BUCKET ||
L56453-05	BUCKET ||
L56453-06	BUCKET ||

Report Comments:

Internal Comments

AREV:
Initials, Date

SREV:
Initials, Date

12/27/2019 8:58:11 AM 123119

ACZ Laboratories, Inc.
AUTO TITRATOR DATA REVIEW CHECKLIST

AREV: ENB
Date: 12/30/19

SREV: EMK
Date: 12/30/19

Work Group: 488883
Sample Type: Phalkcon-MWMT
Analysis Date: 12/27/19
Analyst: ENB

Instrument ID: manip2

	Yes	No	N/A
1.) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓✓		
2.) Are all of the QC critera listed in LIMS within specified acceptance limits?		✓✓	
3.) **pH ONLY:** Is the difference between the 2 replicates of each sample < 0.1 ?	✓✓		
4.) If new acid was prepared, was it standardized? (Attach standardization report.)			✓✓
5.) **Alk, EC, pH:** All analyses performed on an unaltered sample (not centrifuged, diluted, etc.) *	✓✓		
6.) **Fluoride:** Is any sample analyzed on dilution appropriately "D" qualified (except o-cal)?			✓✓
7.) **Fluoride only**: Were all sx's checked with TISAB?			✓✓
8.) Were all samples run within hold time (other than pH)? Flag if "No."	✓✓		
9.) Is a current standard/reagent sheet attached to the workgroup?	✓✓		
10.) **EC ONLY**:Is the meter calibration reading within acceptable limits (1271.7-1554.3)?	✓		Ø EMK 12/30/19
11.) **For WG's containing DW samples**: PQV included for F-, Alk, & EC as applicable?			✓✓
12.) **FOR SREV**: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? YES

Calibration WG: 488881 ✓

Slope (Fluoride only) —

Normality H2SO4 for ALK: 0.0201

Disposable Vessel Lot**: —

For any item listed above that is checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
453-06 DUP	RPD OUT (WC DUP)	Redo

Comments:

* If no, qualify data with ZW. Altering the sample is a modification to the method.

** Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488883

Date Reported: 30-Dec-19
Run ID: R1765897
Date Analyzed: 27-Dec-19
ICAL Workgroup: WG488881
Instrument ID: MANIP2

WG488883PBW

Tag: Measured: 12/27/2019 12:57:24 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	FOUND		1	U ✓	mg/L	++	2	20			

WG488883LCSW1

Tag: Measured: 12/27/2019 1:09:57 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	FOUND	801 ✓	1		mg/L	++	2	20			
SREV	ALKALINITY	REC	98	1		%	++	2	20			

WG488184PBS

Tag: Measured: 12/27/2019 1:18:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	FOUND	6.1	1	B	mg/L	++	2	20			
FAIL	PH	FOUND	7.5	1		units	NEED	0.1	0.1			

L56331-01

Tag: Measured: 12/27/2019 1:23:05 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT		1	U	mg/L	++	2	20		Q6 RA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	HCO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	

L56331-02

Tag: Measured: 12/27/2019 1:30:01 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT	3.7	1	B	mg/L	++	2	20		Q6 RA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	HCO3 AS CACO3	ALK-MWMT	3.7	1	B	mg/L	++	2	20		Q6 TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	

L56331-03

Tag: Measured: 12/27/2019 1:35:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT		1	U	mg/L	++	2	20		Q6 RA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	HCO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	

L56331-04

Tag: Measured: 12/27/2019 1:41:34 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT	2.4	1	B	mg/L	++	2	20		Q6 RA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	HCO3 AS CACO3	ALK-MWMT	2.4	1	B	mg/L	++	2	20		Q6 TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	

L56331-05

Tag: Measured: 12/27/2019 1:46:06 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT		1	U	mg/L	++	2	20		Q6 RA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	HCO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	

L56331-06

Tag: Measured: 12/27/2019 1:54:32 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT	60.7	1		mg/L	++	2	20		Q6 RA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	HCO3 AS CACO3	ALK-MWMT	60.7	1		mg/L	++	2	20		Q6 TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	

L56331-07

Tag: Measured: 12/27/2019 1:59:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT		1	U	mg/L	++	2	20		Q6 RA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	HCO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	

L56331-08

Tag: Measured: 12/27/2019 2:03:41 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT		1	U	mg/L	++	2	20		Q6 RA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	HCO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	

L56331-09

Tag: Measured: 12/27/2019 2:07:52 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT		1	U	mg/L	++	2	20		Q6 RA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	HCO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TB	

L56331-09DUP

Tag: Measured: 12/27/2019 2:12:03 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	FOUND		1	U	mg/L	++	2	20			
SREV	ALKALINITY	RPD	0	1		%	++	2	20		RA	

WG488413PBS

Tag: Measured: 12/27/2019 2:17:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	FOUND		1	U	mg/L	++	2	20			
SREV	PH	FOUND	4.9	1		units	NEED	0.1	0.1			

L56452-01

Tag: Measured: 12/27/2019 2:26:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	ALK-MWMT	138	1		mg/L	++	2	20		Q6 RA TA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	HCO3 AS CACO3	ALK-MWMT	138	1		mg/L	++	2	20		Q6 TA TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	

WG488496PBS

Tag: Measured: 12/27/2019 2:34:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	FOUND	3.1	1	B	mg/L	++	2	20			
SREV	PH	FOUND	6.9	1		units	NEED	0.1	0.1			

L56453-01

Tag: Measured: 12/27/2019 2:38:28 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	ALKALINITY	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	HCO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	

L56453-02

Tag: Measured: 12/27/2019 2:43:12 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	ALKALINITY	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	HCO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	

L56453-03

Tag: Measured: 12/27/2019 2:51:53 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	ALKALINITY	ALK-MWMT	69.9	1		mg/L	++	2	20		Q6 TA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	HCO3 AS CACO3	ALK-MWMT	69.9	1		mg/L	++	2	20		Q6 TA TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	

L56453-04

Tag: Measured: 12/27/2019 3:00:26 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	ALKALINITY	ALK-MWMT	41.4	1		mg/L	++	2	20		Q6 TA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	HCO3 AS CACO3	ALK-MWMT	41.4	1		mg/L	++	2	20		Q6 TA TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	

L56453-05

Tag: Measured: 12/27/2019 3:08:50 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	ALKALINITY	ALK-MWMT	24.6	1		mg/L	++	2	20		Q6 TA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	HCO3 AS CACO3	ALK-MWMT	24.6	1		mg/L	++	2	20		Q6 TA TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	

L56453-06

Tag: Measured: 12/27/2019 3:17:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
REDO	ALKALINITY	ALK-MWMT	57.5	1		mg/L	++	2	20		Q6 TA TB	
SREV	CO3 AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	
SREV	HCO3 AS CACO3	ALK-MWMT	57.5	1		mg/L	++	2	20		Q6 TA TB	
SREV	OH AS CACO3	ALK-MWMT		1	U	mg/L	++	2	20		Q6 TA TB	

L56453-06DUP

Tag: Measured: 12/27/2019 3:26:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
FAIL	ALKALINITY	FOUND	31.4	1		mg/L	++	2	20			
FAIL	ALKALINITY	RPD	59	1		%	ALRT	2	20			

WG488883LCSW2

Tag: Measured: 12/27/2019 3:37:43 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	ALKALINITY	FOUND	790	1		mg/L	++	2	20			
SREV	ALKALINITY	REC	96	1		%	++	2	20			

ACZ Labs

Report Date: 12/27/2019

Report Time: 3:42 PM

RunNumber 17180

OrderNumber 20191227-7

SampleID	RunDate	RunTime	cond (uS)	Cond Temp (C)	pH	ph2	pH (mV)	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	Alk Sample Vol (mL)	Temp	mL H2SO4 (8.3 pH)	mL H2SO4 (4.5 pH)	mL H2SO4 (4.2 pH)
WG488883PBW	12/27/2019	12:57 PM	-1.00	-1.00	6.50	6.48	36.37	.00	.68	.68	.00	.00	25.00	21.53	.00	.06	.10
WG488883LCSW1	12/27/2019	1:09 PM	-1.00	-1.00	9.10	9.11	-114.13	70.25	801.02	660.53	140.49	.00	25.00	20.95	1.75	19.93	20.07
WG488184PBS	12/27/2019	1:18 PM	-1.00	-1.00	7.46	7.46	-19.28	.00	6.10	6.10	.00	.00	25.00	21.45	.00	.19	.23
L56331-01	12/27/2019	1:23 PM	-1.00	-1.00	4.36	4.36	159.05	.00	-2.52	-2.52	.00	.00	25.00	21.06	.00	.00	.06
L56331-02	12/27/2019	1:30 PM	-1.00	-1.00	5.90	5.90	70.06	.00	3.68	3.68	.00	.00	25.00	20.95	.00	.17	.25
L56331-03	12/27/2019	1:35 PM	-1.00	-1.00	5.00	5.00	122.55	.00	-.32	-.32	.00	.00	25.00	21.99	.00	.06	.13
L56331-04	12/27/2019	1:41 PM	-1.00	-1.00	5.62	5.62	86.66	.00	2.37	2.37	.00	.00	25.00	21.32	.00	.14	.22
L56331-05	12/27/2019	1:46 PM	-1.00	-1.00	4.34	4.33	160.27	.00	-2.00	-2.00	.00	.00	25.00	20.91	.00	.00	.05
L56331-06	12/27/2019	1:54 PM	-1.00	-1.00	7.86	7.86	-42.84	.00	60.68	60.68	.00	.00	25.00	20.65	.00	1.51	1.58
L56331-07	12/27/2019	1:59 PM	-1.00	-1.00	4.49	4.49	151.48	.00	-3.81	-3.81	.00	.00	25.00	21.67	.00	.00	.09
L56331-08	12/27/2019	2:03 PM	-1.00	-1.00	4.31	4.31	161.74	.00	-1.67	-1.67	.00	.00	25.00	21.15	.00	.00	.04
L56331-09	12/27/2019	2:07 PM	-1.00	-1.00	3.91	3.91	184.20	.00	.00	.00	.00	.00	25.00	20.43	.00	.00	.00
L56331-09DUP	12/27/2019	2:12 PM	-1.00	-1.00	3.90	3.90	184.93	.00	.00	.00	.00	.00	25.00	20.58	.00	.00	.00
WG488413PBS	12/27/2019	2:17 PM	-1.00	-1.00	4.91	4.90	127.44	.00	-.54	-.54	.00	.00	25.00	21.22	.00	.03	.07
L56452-01	12/27/2019	2:26 PM	-1.00	-1.00	8.02	8.02	-51.87	.00	138.19	138.19	.00	.00	25.00	21.58	.00	3.44	3.53
WG488496PBS	12/27/2019	2:34 PM	-1.00	-1.00	6.94	6.95	9.64	.00	3.08	3.08	.00	.00	25.00	21.70	.00	.12	.16
L56453-01	12/27/2019	2:38 PM	-1.00	-1.00	4.34	4.35	160.15	.00	-2.13	-2.13	.00	.00	25.00	21.63	.00	.00	.05
L56453-02	12/27/2019	2:43 PM	-1.00	-1.00	4.43	4.43	155.02	.00	-2.97	-2.97	.00	.00	25.00	21.63	.00	.00	.07
L56453-03	12/27/2019	2:51 PM	-1.00	-1.00	7.96	7.97	-48.95	.00	69.88	69.88	.00	.00	25.00	21.83	.00	1.74	1.81
L56453-04	12/27/2019	3:00 PM	-1.00	-1.00	7.75	7.75	-36.62	.00	41.43	41.43	.00	.00	25.00	21.53	.00	1.03	1.12
L56453-05	12/27/2019	3:08 PM	-1.00	-1.00	7.64	7.64	-30.27	.00	24.55	24.55	.00	.00	25.00	21.95	.00	.61	.69
L56453-06	12/27/2019	3:17 PM	-1.00	-1.00	7.70	7.70	-33.44	.00	57.54	57.54	.00	.00	25.00	21.60	.00	1.43	1.51
L56453-06DUP	12/27/2019	3:26 PM	-1.00	-1.00	7.71	7.71	-34.05	.00	31.40	31.40	.00	.00	25.00	21.40	.00	.78	.86

Copyright Hinterland Software Ltd.

Report Date: 12/27/2019

Report Time: 3:42 PM

RunNumber	OrderNumber
17180	20191227-7

SampleID	RunDate	RunTime	cond (uS)	Cond Temp (C)	pH	ph2	pH (mV)	palk-ppm	talk-ppm	bcarb-ppm	carb-ppm	hydr-ppm	Alk Sample Vol (mL)	Temp	mL H2SO4 (8.3 pH)	mL H2SO4 (4.5 pH)	mL H2SO4 (4.2 pH)
WG488883LCSW2	12/27/2019	3:37 PM	-1.00	-1.00	9.11	9.11	-115.23	67.76	789.59	654.07	135.51	.00	25.00	22.31	1.69	19.64	19.80

GENERAL RESULTS REPORT.SRW

PC-TitratION PLUS by Man-Tech Associates, Inc.

Copyright Hinterland Software Ltd.

PC-TitratION PLUS
Calibration Report

Calibration Record # 6009

Calibration Settings

Calibration ID	CONDUCTIVITY 1413	Date	12/27/2019
Channel		Time	9:16 AM
Probe Type	Linear	Temperature	-999.00 K -1272.15 C
Probe ID	3, Device Man-Tech 991	Analysis Type	Single Line Fit

Calibration Results

Slope	1.001	CorrCoeff	0.0000
Intercept	0.000	Equation:	Y = (1.001) X + (0.000)

Calibration Validity **True** Operator

	Result	Minimum	Maximum
Slope	1.001	0.00	0.00
Intercept	0.000	0.00	0.00
Correlation Coefficient	0.0000	0.00	1.00

Note: "True" means the calibration was within the specified ranges
"False" means the calibration was NOT within the specified ranges

Calibration Data	**Standard**	**Reading**
	1413.00	1414.00

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PC-TitratION PLUS
Calibration Report

Calibration Record # 6010

Calibration Settings

Calibration ID	PH CAL 4-7-10	Date	12/27/2019	
Channel	1	Time	9:34 AM	
Probe Type	pH	Temperature	294.75 K	21.60 C
Probe ID	PH ELECTRODE	Analysis Type	Single Line Fit	

Calibration Results

Slope	-57.703	CorrCoeff	0.9999 ✓
Intercept	6.827	Equation:	Y = (-57.703) X + (6.827)

Calibration Validity **True** Operator

	Result	Minimum	Maximum
Slope	-57.703	-65.00	-53.00
Intercept	6.827	-100.00	100.00
Correlation Coefficient	0.9999	0.99	1.00

Note: "True" means the calibration was within the specified ranges
"False" means the calibration was NOT within the specified ranges

Calibration Data	**Standard**	**Reading**
	2.00	297.24
	4.00	180.17
	7.00	5.73
	10.00	-171.75
	13.00	-334.96

Copyright Hinterland Software Ltd.

Parameter: PHALKCON

Instr: Man-Tech

	REAGENT	PCN/SCN	EXPIRATION DATE
Titration Reagents:	0.02 N H_2SO4	PCN58773	**1/23/2020**
	0.2 N H_2SO4		
	1 N H_2SO4		
	2 N H_2SO4		
Ph probe reagents:	2.0 Buffer	PCN58293	12/31/2020
	4.0 Buffer	PCN58503	11/30/2020
	7.0 Buffer	PCN58542	12/31/2020
	10.0 Buffer	PCN59339	3/31/2021
	13.0 Buffer	PCN57863	5/31/2020
additional reagents:	EC Cal Std.	PCN59739	7/31/2021

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG488883 **PHALKCON**

Sample	Date	SCN	ALKALINITY	CO3 AS CACO3	HCO3 AS CACO3	OH AS CACO3	PH
WG488883PBW	12/27/19 12:57		X				
WG488883LCSW1	12/27/19 13:09	WC191226-5	X				
WG488184PBS	12/27/19 13:18						X
WG488184PBS	12/27/19 13:18		X				
L56331-01	12/27/19 13:23		X	X	X	X	
L56331-02	12/27/19 13:30		X	X	X	X	
L56331-03	12/27/19 13:35		X	X	X	X	
L56331-04	12/27/19 13:41		X	X	X	X	
L56331-05	12/27/19 13:46		X	X	X	X	
L56331-06	12/27/19 13:54		X	X	X	X	
L56331-07	12/27/19 13:59		X	X	X	X	
L56331-08	12/27/19 14:03		X	X	X	X	
L56331-09	12/27/19 14:07		X	X	X	X	
L56331-09DUP	12/27/19 14:12		X				
WG488413PBS	12/27/19 14:17		X				
WG488413PBS	12/27/19 14:17						X
L56452-01	12/27/19 14:26		X	X	X	X	
WG488496PBS	12/27/19 14:34		X				
WG488496PBS	12/27/19 14:34						X
L56453-01	12/27/19 14:38						
L56453-02	12/27/19 14:43						
L56453-03	12/27/19 14:51						
L56453-04	12/27/19 15:00						
L56453-05	12/27/19 15:08						
L56453-06	12/27/19 15:17						
L56453-06DUP	12/27/19 15:26		X				

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG488883 **PHALKCON**

Sample	Date	SCN	ALKALINITY	CO3 AS CACO3	HCO3 AS CACO3	OH AS CACO3	PH
WG488883LCSW2	12/27/19 15:37	WC191226-5	X				

L56331-2006231417

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 18:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE	AS REC		12/18/19 6:51		10.08		10.08	10.08							20.1
2	WG488184CSTD2	NONE	AS REC		12/18/19 8:27		7.02		7.02	7.02							20.3
3	WG488184CSTD3	NONE	AS REC		12/18/19 10:02		2.07		2.07	2.07							20.3
4	WG488184ICV	PCN58503	AS REC		12/18/19 11:38		3.97		3.97	3.97							20.1
5	WG488184PBS	NONE	AS REC		12/18/19 17:59		4.89		6.18	6.21	0	5002.4		12/17/2019 8:45:00 AM	12/18/2019 10:20:00 AM	25.58333333326	19
6	L56331-01	STSB32_0.5-3	AS REC		12/17/19 7:00	0	4.89	23	4.16	4.2	5000	5017	11.3	12/17/2019 8:45:00 AM	12/18/2019 1:30:00 PM	28.74999999994	19.3
7	L56331-02	STSB32_6-15	AS REC		12/17/19 8:35	0	4.89	23	5.33	5.48	5000	5000.7	20.37	12/17/2019 8:45:00 AM	12/18/2019 2:00:00 PM	29.25	19.9
8	L56331-03	STSB34_0.5-3	AS REC		12/17/19 10:10	0	4.89	23	4.94	4.9	5000	5003	10.64	12/17/2019 8:45:00 AM	12/18/2019 1:34:00 PM	28.81666666665	19.9
9	L56331-04	STSB34_6-15	AS REC		12/17/19 11:46	0	4.89	23	5.26	5.38	5000	5003.4	19.98	12/17/2019 8:45:00 AM	12/18/2019 1:35:00 PM	28.8333333332	19.8
10	L56331-05	STSB33_0.5-3	AS REC		12/17/19 13:21	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
11	L56331-05MS1	MS191119-5	AS REC		12/17/19 14:57	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
12	L56331-05MSD1	MS191119-5	AS REC		12/17/19 18:08	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
13	L56331-05MS2	II191204-3	AS REC		12/17/19 16:32	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
14	L56331-05MSD2	II191204-3	AS REC		12/17/19 19:43	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
15	WG488184CCV1	PCN58503	AS REC		12/18/19 3:40		4.06		4.07	4.08							19.8
16	L56331-06	STSB33_6-15	AS REC		12/17/19 21:19	0	4.89	23	7.07	7.34	5000	5009.7	21.6	12/17/2019 8:45:00 AM	12/18/2019 4:00:00 PM	31.24999999988	19.2
17	L56331-07	STSB33-FD_0.5-3	AS REC		12/17/19 22:54	0	4.89	23	4.28	4.34	5000	5000.3	16.22	12/17/2019 8:45:00 AM	12/18/2019 2:25:00 PM	29.66666666663	19.2
18	L56331-08	STSB35_0.5-3	AS REC		12/18/19 0:29	0	4.89	23	4.25	4.21	5000	5000	11.69	12/17/2019 8:45:00 AM	12/18/2019 2:15:00 PM	29.49999999994	19.2
19	L56331-09	STSB35_6-15	AS REC		12/18/19 2:05	0	4.89	23	3.87	3.8	5000	5004.4	11.16	12/17/2019 8:45:00 AM	12/18/2019 2:15:00 PM	29.49999999994	19.4
20	WG488184ICV1		AS REC		12/18/19 13:13		3.97		3.97	3.97							20.1
20	WG488184LFB1	II191204-3	AS REC		12/18/19 14:49	0	4.89	23	6.18	6.21	0	5002.4		12/17/2019 8:45:00 AM	12/18/2019 10:20:00 AM	25.58333333326	19
21	WG488184LFB2	MS191119-5	AS REC		12/18/19 16:24	0	4.89	23	6.18	6.21	0	5002.4		12/17/2019 8:45:00 AM	12/18/2019 10:20:00 AM	25.58333333326	19

Report Comments: _____

Internal Comments _____

AREV: GKH 12/23/19
Initials, Date

SREV: _____
Initials, Date

12/23/2019 8:44:05 AM 10120

L56331-2006231417

Meteoric Water Mobility

WG488184

ACZ Laboratories, Inc

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 18:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
22	WG488184CCV2	PCN58503	AS REC		12/18/19 5:16		4.03		4.07	4.02							19.7

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MS2	ICP Spike
L56331-05MSD1	ICPMS Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184CCV1	pH QC
WG488184CCV2	pH QC
WG488184CSTD1	pH QC
WG488184CSTD2	pH QC
WG488184CSTD3	pH QC
WG488184ICV	pH QC
WG488184ICV1	WG488184ICV1
WG488184LFB1	ICP LFB
WG488184LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/23/2019 8:44:05 AM 10120

ACZ Laboratories, Inc.
Geochemistry Department
Data Review and Reagents

Data Reviewer: GKH
Date: 12/19/19

Approved: CRA
Date: 12-20-19

Analyst: GKH

Workgroup: WG488184

Analysis Date: 12/17/19 - 12/18/19

Sample type used: SO

Extraction / Digestion / Analysis / Prep / Calc:

	Yes	No	N/A
1. Is the raw data checked to the computer printout for transcription errors?	✓		
2. Is the %solid or TS attached for dilution factors?			✓
3. Were proper volumes of reagents used per final volume?			✓
4. Was the proper sub-sample used (as received, client prep,<2000, <500, <250, dry, R&P, RPLL)?	✓		
5.Were the dilution factor calculation checked (final volume, weight, %solid)?			✓
6. Did the RPD pass?			✓
7. Does all the spike information correlate with each other?	✓		
8. Is the appropriate spike in the computer-designated line?	✓		
9. Are all errors properly corrected (single-line crossout, dated & initialed)?	✓		
10. Is the standard/reagent information complete and current?	✓		
11. Is your instrument calibration passing (and included in the data package if needed)?	✓		
FOR SREV: QA/QC approval for initial training or 2 sets of initials for WG & LIMS?			

Standard/Reagent/Equipment*	PCN/SCN/LOT #*	Expiration Date
BUFFER 10	59339	3/31/21
7	58542	12/31/20
2	58293	12/31/20

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

Comments:

METEORIC WATER MOBILITY TEST

ACZ Laboratories, Inc.
2773 Downhill Drive
Steamboat Springs, CO 80487

Analyst: **GKH**
Date:
Start Time: **12/17/19 7a**
End Time: **12/18/19 6p**

Workgroup Number:

Loaded Sample Wet Weight

Sx Number	Sx Wet Weight (g)
L56331-01	5238
L56331-02	5700
L56331-03	5253
L56331-04	6092
L56331-05	5341
L56331-06	5492
L56331-07	5249
L56331-08	5225
L56331-09	5382

H2O rate start: 3.5 mL/Min
H2O rate finish: 3.5mL/Min

Filter Type/pore size: 0.45 um Filter
Special Comments:

Dry Weight Calculations

Sx Number	Sx Weight (g) (From above)	(x)	% Solid	=	Dry Sx Weight (g)	+	Cubetainer Weight (g)	=	Target Leachate & Cubtainer Wt (g)
L56331-01	5238	x	0.954742967	=	5000.943659	+	137	=	5137.94366
L56331-02	5700	x	0.877305405	=	5000.640807	+	139.4	=	5140.04081
L56331-03	5253	x	0.951968179	=	5000.688844	+	136	=	5136.68884
L56331-04	6092	x	0.820752165	=	5000.022186	+	138.2	=	5138.22219
L56331-05	5341	x	0.936314337	=	5000.854872	+	140.5	=	5141.35487
L56331-06	5492	x	0.910436387	=	5000.116637	+	136	=	5136.11664
L56331-07	5249	x	0.952600056	=	5000.197691	+	139.5	=	5139.69769
L56331-08	5225	x	0.956940692	=	5000.015115	+	139.9	=	5139.91512
L56331-09	5382	x	0.929147599	=	5000.67238	+	139.3	=	5139.97238

Final Leachate Weight

Sx Number	Actual Leachate & Cubetainer	-	Cubetainer Wt (g)	=	Final Leachate Volume (mL)
L56331-01	5154	-	137	=	5017
L56331-02	5140.1	-	139.4	=	5000.7
L56331-03	5139	-	136	=	5003
L56331-04	5141.6	-	138.2	=	5003.4
L56331-05	5162.5	-	140.5	=	5022
L56331-06	5145.7	-	136	=	5009.7
L56331-07	5139.8	-	139.5	=	5000.3
L56331-08	5139.9	-	139.9	=	5000
L56331-09	5143.7	-	139.3	=	5004.4

Comments:

METEORIC WATER MOBILITY TEST

ACZ Laboratories, Inc.
2773 Downhill Drive
Steamboat Springs, CO 80487

Analyst: **GKH**
Date:
Start Time: 12/17/19 7a
End Time: 12/18/19 6p

Workgroup Number: WG488184

Feed Moisture

Sx Number	Pan Weight (g)	Wet Sx + Pan Weight (g)	Dry Sx + Pan Weight (g)	% Solid	% Feed Moisture
L56331-01	137.29	680.41	655.83	95.47429666	4.525703344
L56331-02	160.91	660.28	599.01	87.73054048	12.26945952
L56331-03	151.39	684.37	658.77	95.19681789	4.803182108
L56331-04	141.59	659.03	566.28	82.07521645	17.92478355
L56331-05	150.66	661.45	628.92	93.63143366	6.368566338
L56331-06	153.38	652.02	607.36	91.0436387	8.956361303
L56331-07	148.3	652.52	628.62	95.26000555	4.739994447
L56331-08	149.68	678.95	656.16	95.69406919	4.30593081
L56331-09	149.79	665.51	628.97	92.91475995	7.085240053

Screening-Particle Size

Sx Number	Sx Weight (g)	Sx > 5 cm (g)	Sx < 5 cm (g)	%Sx > 5cm	%Sx < 5cm
L56331-01			0	#DIV/0!	#DIV/0!
L56331-02			0	#DIV/0!	#DIV/0!
L56331-03			0	#DIV/0!	#DIV/0!
L56331-04			0	#DIV/0!	#DIV/0!
L56331-05			0	#DIV/0!	#DIV/0!
L56331-06			0	#DIV/0!	#DIV/0!
L56331-07			0	#DIV/0!	#DIV/0!
L56331-08			0	#DIV/0!	#DIV/0!
L56331-09			0	#DIV/0!	#DIV/0!

Residual Moisture

Sx Number	Pan Weight (g)	Wet Sx + Pan Weight (g)	Dry Sx + Pan Weight (g)	% Solid	% Res. Moisture
L56331-01	148.25	822.01	745.88	88.70072429	11.29927571
L56331-02	144.96	899.18	745.54	79.62928588	20.37071412
L56331-03	149.61	845.91	771.83	89.36090765	10.63909235
L56331-04	153.3	856.48	715.99	80.02076282	19.97923718
L56331-05	146.67	952.87	821.71	83.7310841	16.2689159
L56331-06	151.38	971.68	794.53	78.40424235	21.59575765
L56331-07	149.75	896.72	775.53	83.77578751	16.22421249
L56331-08	151.47	899.01	811.61	88.30831795	11.69168205
L56331-09	145.91	815.17	740.45	88.83543018	11.16456982

Time and Temperature for Residual Moisture:
Sample Description: Sand/ Small aggregates
Centrifuge or pre-filter? N/A
Observation of changes: N/A
Storage Conditions of "as rec" sample: Room

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst:
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE					10.08										20.1
2	WG488184CSTD2	NONE					7.02										20.3
3	WG488184CSTD3	NONE					2.07										20.3
4	WG488184ICV	PCN58503					3.97										20.1
5	WG488184PBS	NONE					4.89		6.18	6.21				8:45	10:20		19.0
6	L56331-01	STSB32_0.5-3							4.16	4.20					13:30		19.3
7	L56331-02	STSB32_6-15							5.33	5.48					14:00		19.9
8	L56331-03	STSB34_0.5-3							4.94	4.90					13:45		19.9
9	L56331-04	STSB34_6-15							5.26	5.38					13:35		19.8
10	L56331-05	STSB33_0.5-3							4.30	4.19					15:20		19.8
11	L56331-05MS1	MS191119-5															
12	L56331-05MSD1	MS191119-5															
13	L56331-05MS2	II191204-3															
14	L56331-05MSD2	II191204-3															
15	WG488184CCV1	PCN58503					4.06		4.07	4.08				—	—		19.8
16	L56331-06	STSB33_6-15					4.89		7.07	7.34				8:45	16:00		19.2
17	L56331-07	STSB33-FD_0.5-3					4.89		4.28	4.34					14:25		19.2
18	L56331-08	STSB35_0.5-3							4.25	4.21					14:15		19.2
19	L56331-09	STSB35_6-15							3.87	3.80					14:15		19.4
20	WG488184LFB1	II191204-3							6.18	6.21					10:20		19.0
21	WG488184LFB2	MS191119-5															
22	WG488184CCV2	PCN58503					4.03		4.07	4.02				—	—		19.7

Report Comments:

Internal Comments

AREV: Initials, Date

SREV: Initials, Date

12/16/2019 10:07:49 AM 10120

L56331-2006231417

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst:
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MS2	ICP Spike
L56331-05MSD1	ICPMS Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184CCV1	pH QC
WG488184CCV2	pH QC
WG488184CSTD1	pH QC
WG488184CSTD2	pH QC
WG488184CSTD3	pH QC
WG488184ICV	pH QC
WG488184LFB1	ICP LFB
WG488184LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/16/2019 10:07:49 AM 10120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488184

Date Reported: 23-Dec-19
Run ID: R1765314
Date Analyzed: 17-Dec-19
ICAL Workgroup:
Instrument ID: SOILSPREP

L56331-01

Tag: **Measured:** 12/17/2019 7:00:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	WMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	WMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	WMT-96	28.75	1		hrs	++					
SREV	LEACHATE VOLUME	WMT-96	5017	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	WMT-96	0	1		%	++					
SREV	POST FILTER PH	WMT-96		1		units	++			4.2		
SREV	PRE FILTER PH	WMT-96		1		units	++			4.16		
SREV	RETAINED MOISTURE	WMT-96		1		%	++			11.3		
SREV	TEMPERATURE	WMT-96	19.3	1		C	++	0.1	0.1			
SREV	TIME IN	WMT-96		1			++					
SREV	TIME OUT	WMT-96		1			++					
SREV	WEIGHT, DRY	WMT-96	5000	1		g	++					

L56331-02

Tag: **Measured:** 12/17/2019 8:35:27 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	WMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	WMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	WMT-96	29.25	1		hrs	++					
SREV	LEACHATE VOLUME	WMT-96	5000.7	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	WMT-96	0	1		%	++					
SREV	POST FILTER PH	WMT-96		1		units	++			5.48		
SREV	PRE FILTER PH	WMT-96		1		units	++			5.33		
SREV	RETAINED MOISTURE	WMT-96		1		%	++			20.37		
SREV	TEMPERATURE	WMT-96	19.9	1		C	++	0.1	0.1			
SREV	TIME IN	WMT-96		1			++					
SREV	TIME OUT	WMT-96		1			++					
SREV	WEIGHT, DRY	WMT-96	5000	1		g	++					

L56331-03

Tag: Measured: 12/17/2019 10:10:54 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	28.81667	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5003	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			4.9		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			4.94		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			10.64		
SREV	TEMPERATURE	ıWMT-96	19.9	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-04

Tag: Measured: 12/17/2019 11:46:21 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	28.83333	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5003.4	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			5.38		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			5.26		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			19.98		
SREV	TEMPERATURE	ıWMT-96	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-05

Tag: Measured: 12/17/2019 1:21:48 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	30.58333	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			4.19		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			4.3		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			16.27		
SREV	TEMPERATURE	ıWMT-96	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-05MS1

Tag:

Measured: 12/17/2019 2:57:15 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333333139	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			4.19		
SREV	PRE FILTER PH	TEXT		1		units	++			4.3		
SREV	RETAINED MOISTURE	TEXT		1		%	++			16.27		
SREV	TEMPERATURE	PREP	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	5000	1		g	++					

L56331-05MS2

Tag:

Measured: 12/17/2019 4:32:42 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333333139	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			4.19		
SREV	PRE FILTER PH	TEXT		1		units	++			4.3		
SREV	RETAINED MOISTURE	TEXT		1		%	++			16.27		
SREV	TEMPERATURE	PREP	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	5000	1		g	++					

L56331-05MSD1

Tag:

Measured: 12/17/2019 6:08:09 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333333139	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			4.19		
SREV	PRE FILTER PH	TEXT		1		units	++			4.3		
SREV	RETAINED MOISTURE	TEXT		1		%	++			16.27		
SREV	TEMPERATURE	PREP	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	5000	1		g	++					

L56331-05MSD2

Tag: Measured: 12/17/2019 7:43:36 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333333139	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5022	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			4.19		
SREV	PRE FILTER PH	TEXT		1		units	++			4.3		
SREV	RETAINED MOISTURE	TEXT		1		%	++			16.27		
SREV	TEMPERATURE	PREP	19.8	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	5000	1		g	++					

L56331-06

Tag: Measured: 12/17/2019 9:19:03 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	31.25	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5009.7	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			7.34		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			7.07		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			21.6		
SREV	TEMPERATURE	ıWMT-96	19.2	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-07

Tag: Measured: 12/17/2019 10:54:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	29.66667	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5000.3	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			4.34		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			4.28		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			16.22		
SREV	TEMPERATURE	ıWMT-96	19.2	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-08

Tag: Measured: 12/18/2019 12:29:57 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	29.5	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5000	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			4.21		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			4.25		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			11.69		
SREV	TEMPERATURE	ıWMT-96	19.2	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

L56331-09

Tag: Measured: 12/18/2019 2:05:24 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	ıWMT-96		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	ıWMT-96	23.0	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	ıWMT-96	29.5	1		hrs	++					
SREV	LEACHATE VOLUME	ıWMT-96	5004.4	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	ıWMT-96	0	1		%	++					
SREV	POST FILTER PH	ıWMT-96		1		units	++			3.8		
SREV	PRE FILTER PH	ıWMT-96		1		units	++			3.87		
SREV	RETAINED MOISTURE	ıWMT-96		1		%	++			11.16		
SREV	TEMPERATURE	ıWMT-96	19.4	1		C	++	0.1	0.1			
SREV	TIME IN	ıWMT-96		1			++					
SREV	TIME OUT	ıWMT-96		1			++					
SREV	WEIGHT, DRY	ıWMT-96	5000	1		g	++					

WG488184CCV1

Tag: Measured: 12/18/2019 3:40:51 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	NEED			4.06		
SREV	POST FILTER PH	TEXT		1		units	NEED			4.08		
SREV	PRE FILTER PH	TEXT		1		units	NEED			4.07		
SREV	TEMPERATURE	PREP	19.8	1		C	NEED	0.1	0.1			

WG488184CCV2

Tag: Measured: 12/18/2019 5:16:18 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	NEED			4.03		
SREV	POST FILTER PH	TEXT		1		units	NEED			4.02		
SREV	PRE FILTER PH	TEXT		1		units	NEED			4.07		
SREV	TEMPERATURE	PREP	19.7	1		C	NEED	0.1	0.1			

WG488184ICV1

Tag: Measured: 12/18/2019 11:38:06 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	NEED			3.97		
SREV	POST FILTER PH	TEXT		1		units	NEED			3.97		
SREV	PRE FILTER PH	TEXT		1		units	NEED			3.97		
SREV	TEMPERATURE	PREP	20.1	1		C	NEED	0.1	0.1			

WG488184ICV1

Tag: 1 Measured: 12/18/2019 1:13:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	NEED			3.97		
SREV	POST FILTER PH	TEXT		1		units	NEED			3.97		
SREV	PRE FILTER PH	TEXT		1		units	NEED			3.97		
SREV	TEMPERATURE	PREP	20.1	1		C	NEED	0.1	0.1			

WG488184LFB1

Tag: Measured: 12/18/2019 2:49:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333332557	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5002.4	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			6.21		
SREV	PRE FILTER PH	TEXT		1		units	++			6.18		
SREV	TEMPERATURE	PREP	19	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	0	1		g	++					

WG488184LFB2

Tag: Measured: 12/18/2019 4:24:27 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TEMPERATURE	REG	23	1		C	++	0.1	0.1			
SREV	EXTRACTION TIME	PREP	3333332557	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5002.4	1		mL	++					
SREV	PARTICLE SIZE OVER 5 CM	PREP	0	1		%	++					
SREV	POST FILTER PH	TEXT		1		units	++			6.21		
SREV	PRE FILTER PH	TEXT		1		units	++			6.18		
SREV	TEMPERATURE	PREP	19	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	0	1		g	++					

WG488184PBS

Tag: Measured: 12/18/2019 5:59:54 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	EXTRACTION PH	TEXT		1		units	++			4.89		
SREV	EXTRACTION TIME	PREP	3333332557	1		hrs	++					
SREV	LEACHATE VOLUME	PREP	5002.4	1		mL	++					
SREV	POST FILTER PH	TEXT		1		units	++			6.21		
SREV	PRE FILTER PH	TEXT		1		units	++			6.18		
SREV	TEMPERATURE	PREP	19	1		C	++	0.1	0.1			
SREV	TIME IN	DATE		1			++					
SREV	TIME OUT	DATE		1			++					
SREV	WEIGHT, DRY	PREP	0	1		g	++					

L56331-2006231417

TKN-MWMT

QC List Type: QC-RFA-N-TK
QCListMatClass: SOLID
Bench Sheet List:
QC Ref: ICV/B-CCV/B
Group ID: WC-G-RFA-N-TK-MWMT
Method Ref: M351.2
SOP Ref: SOPWC034

WG489518

ACZ Laboratories, Inc

Instrument ID: FIA1
Analyst: PJB
ACZ Dept: 37
Create Date: 01/07/2020 21:51
Start Date/Time: 1/7/2020
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	NTKMWMT	Nitrogen Total Kjeldahl (mg/Kg)	Sample Volume (mL)	Digestion Solution Volume (mL)	Dilution	Comments
1	WG489518ICV	WI191227-6			1	☑				1	
2	WG489518ICB	NONE			1	☑				1	
3	~~L56331-05MS1~~	~~MS191119-5~~			1	☑				1	
4	~~L56331-05MSD1~~	~~MS191119-5~~			1	☑				1	
5	~~L56331-05MS2~~	~~II191204-3~~			1	☑				1	
6	~~L56331-05MSD2~~	~~II191204-3~~			1	☑				1	
7	L56453-01	STSB05_0.5-3			1	☑				1	
8	L56453-02	STSB05_6-15	PJB 1/7/2020		1	☑				1	
9	L56453-03	STSB05_45-55			1	☑				1	
10	~~L56453-03MST~~	~~MS191119-5~~			1	☑				1	
11	~~L56453-03MSD1~~	~~MS191119-5~~			1	☑				1	
12	~~L56453-03MS2~~	~~II191204-3~~			1	☑				1	
13	WG489518CCV1	WI191227-4			1	☑				1	
14	WG489518CCB1	NONE			1	☑				1	
15	~~L56453-03MSD2~~	~~II191204-3~~			1	☑				1	
16	L56453-04	STSB05_66-71			1	☑				1	
17	L56453-05	STSB05_76-81			1	☑				1	
18	L56453-06	STSB06_0.5-3			1	☑				1	
19	WG489472PBS	NONE			1	☑				1	
20	WG489472LFB	WI191227-2			1	☑				1	
21	WG488184PBS	NONE			1	☑				1	
22	L56331-01	STSB32_0.5-3			1	☑				1	

Report Comments:

Internal Comments

AREV: PJB 1/8/2020
Initials, Date

SREV: KRH 1-9-20
Initials, Date

1/7/2020 9:52:16 PM 10120

ACZ Laboratories, Inc.
WET CHEM INSTRUMENT DATA REVIEW CHECKLIST

AREV: PJD
Date: 1/8/2020

SREV: KRH
Date: 1-9-20

Instrument ID: FIA1

Work Group: 489518
Sample Type: TKN-MWMT
Analysis Date: 1/7/2020
Analyst: PJD

	Yes	No	N/A
1) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	X		
2) Is a current standard/reagent sheet attached to the workgroup?	X		
3) If applicable, was sample pH at log-in receipt and/or analysis within method criteria?			X
4) Does the instrument calibration meet the specified method criteria? (r or $r^2 \geq 0.995$)	X		
5) Are all of the QC critera listed in LIMS within specified limits?	X		
6) If applicable, was a passing PQV indcluded in the WG?			X
7) Are all dilution factors correctly calculated and uploaded? (Soil, Sludges, Water)	X		
8) Are dilutions in the appropriate range? (explain if "B" or "U" reported for sample)	X		
9) Was sample-analysis completed within the holding time?	X		
10) Are all applicable qualifiers transferred from bench sheet to LIMS?	X		
11) **For soil/sludge analyses:** Was a hand calculated % recovery performed for LFM/MS/AS?			X
12) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? no

Calibration WG: –

Prep WG#: 489472

Disposable Vessel Lot#*: N/A

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
331-02	DUP 2/10X MDL	NA

Comments:

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

TKN-MWMT

QC List Type: QC-RFA-N-TK
QCListMatClass: SOLID
Bench Sheet List:
QC Ref: ICV/B-CCV/B
Group ID: WC-G-RFA-N-TK-MWMT
Method Ref: M351.2
SOP Ref: SOPWC034

WG489518

ACZ Laboratories, Inc

Instrument ID: FIA1
Analyst:
ACZ Dept: 37
Create Date: 01/07/2020 21:51
Start Date/Time:
End Date/Time:

L56331-2006231417

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	NTKMWMT	Nitrogen Total Kjeldahl (mg/Kg)	Sample Volume (mL)	Digestion Solution Volume (mL)	Dilution	Comments
23	L56331-01MS	WI191227-2			1	☑				1	
24	L56331-02	STSB32_6-15			1	☑				1	
25	WG489518CCV2	WI191227-4			1	☑				1	
26	WG489518CCB2	NONE			1	☑				1	
27	L56331-02DUP	NONE			1	☑				1	
28	L56331-03	STSB34_0.5-3			1	☑				1	
29	L56331-04	STSB34_6-15			1	☑				1	
30	L56331-05	STSB33_0.5-3			1	☑				1	
31	L56331-06	STSB33_6-15			1	☑				1	
32	L56331-07	STSB33-FD_0.5-3			1	☑				1	
33	L56331-08	STSB35_0.5-3			1	☑				1	
34	L56331-09	STSB35_6-15			1	☑				1	
35	WG488496PBS	NONE			1	☑				1	
36	WG489518CCV3	WI191227-4			1	☑				1	
37	WG489518CCB3	NONE			1	☑				1	

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/7/2020 9:52:18 PM 10120

TKN-MWMT

QC List Type: QC-RFA-N-TK
QCListMatClass: SOLID
Bench Sheet List:
QC Ref: ICV/B-CCV/B
Group ID: WC-G-RFA-N-TK-MWMT
Method Ref: M351.2
SOP Ref: SOPWC034

WG489518

ACZ Laboratories, Inc

Instrument ID: FIA1
Analyst:
ACZ Dept: 37
Create Date: 01/07/2020 21:51
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MS2	ICP Spike
L56331-05MSD1	ICPMS Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56453-01	BUCKET ||
L56453-02	BUCKET ||
L56453-03	BUCKET ||
L56453-03MS1	ICPMS Spike
L56453-03MS2	ICP Spike
L56453-03MSD1	ICPMS Spike
L56453-03MSD2	ICP Spike
L56453-04	BUCKET ||
L56453-05	BUCKET ||
L56453-06	BUCKET ||

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/7/2020 9:52:18 PM 10120

L56331-2006231417

X-N-TK-MWMT

QC List Type: I-WCPREP-TKN
QCListMatClass: LIQUID
Bench Sheet List: I-RFA-N-TK
QC Ref: WC PREP SP (2)
Group ID: IP-G-WC-N-TK-MWMT
Method Ref: M351.2
SOP Ref: SOPWC034

WG489472

ACZ Laboratories, Inc

Instrument ID: WCDIG
Analyst: mss2
ACZ Dept: 30
Create Date: 01/07/2020 10:15
Start Date/Time: 01/07/2020 10:15
End Date/Time: 01/07/2020 16:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	NTKMWMT	Digestion Solution Volume (mL)	Sample Volume (mL)	final volume (mL)	Dilution	Comments
1	WG489472PBS	NONE	y		01/07/20 10:15	☑	4	20	20	1	
2	WG489472LFB	WI191227-2	y		01/07/20 10:32	☑	4	20	20	1	
3	WG488184PBS	NONE	y		01/07/20 10:49	☑	4	20	20	1	
4	L56331-01	STSB32_0.5-3	y		01/07/20 11:06	☑	4	20	20	1	
5	L56331-01MS	WI191227-2	y		01/07/20 11:24	☑	4	20	20	1	
6	L56331-02	STSB32_6-15	y		01/07/20 11:41	☑	4	20	20	1	
7	L56331-02DUP	NONE	y		01/07/20 11:58	☑	4	20	20	1	
8	L56331-03	STSB34_0.5-3	y		01/07/20 12:15	☑	4	20	20	1	
9	L56331-04	STSB34_6-15	y		01/07/20 12:33	☑	4	20	20	1	
10	L56331-05	STSB33_0.5-3	y		01/07/20 12:50	☑	4	20	20	1	
11	L56331-06	STSB33_6-15	y		01/07/20 13:07	☑	4	20	20	1	
12	L56331-07	STSB33-FD_0.5-3	y		01/07/20 13:24	☑	4	20	20	1	
13	L56331-08	STSB35_0.5-3	y		01/07/20 13:42	☑	4	20	20	1	
14	L56331-09	STSB35_6-15	y		01/07/20 13:59	☑	4	20	20	1	
15	WG488496PBS	NONE	y		01/07/20 14:16	☑	4	20	20	1	
16	L56453-01	STSB05_0.5-3	y		01/07/20 14:33	☑	4	20	20	1	
17	L56453-02	STSB05_6-15	y		01/07/20 14:51	☑	4	20	20	1	
18	L56453-03	STSB05_45-55	y		01/07/20 15:08	☑	4	20	20	1	
19	L56453-04	STSB05_66-71	y		01/07/20 15:25	☑	4	20	20	1	
20	L56453-05	STSB05_76-81	y		01/07/20 15:42	☑	4	20	20	1	
21	L56453-06	STSB06_0.5-3	y		01/07/20 16:00	☑	4	20	20	1	

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/7/2020 2:03:28 PM 10120

X-N-TK-MWMT

WG489472

ACZ Laboratories, Inc

QC List Type: I-WCPREP-TKN
QCListMatClass: LIQUID
Bench Sheet List: I-RFA-N-TK
QC Ref: WC PREP SP (2)
Group ID: IP-G-WC-N-TK-MWMT
Method Ref: M351.2
SOP Ref: SOPWC034

Instrument ID: WCDIG
Analyst: mss2
ACZ Dept: 30
Create Date: 01/07/2020 10:15
Start Date/Time: 01/07/2020 10:15
End Date/Time: 01/07/2020 16:00

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
L56453-01	BUCKET ||
L56453-02	BUCKET ||
L56453-03	BUCKET ||
L56453-04	BUCKET ||
L56453-05	BUCKET ||
L56453-06	BUCKET ||

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/7/2020 2:03:28 PM 10120

ACZ LABORATORIES, INC
2773 Downhill Drive
Steamboat Springs, CO 80487

WET CHEMISTRY INSTRUMENT
REAGENTS INFORMATION

Instrument: LACHAT

Parameter: TKN H20 / SOILS

Instrument Reagents

SCN

		Prep By:	
1) Buffer	WIR191231-2	pjb	1/31/2020
2) Hypochlorite Solution *Prepare fresh daily	PCN60227	pjb	1/8/2020
3) Sodium Salicylate	WIR191231-3	pjb	1/31/2020
4) Carrier	WIR200107-3	pjb	1/14/2020
5) 0.8N Sodium Hydroxide	PCN58925	pjb	12/31/2020

*All standards and reagents prepared according top SOP.

Working Standards Preparation (All Standards Digested):

Standard ID	Prep Date
C1	12/27/2019
C2	12/27/2019
C3	12/27/2019
C4	12/27/2019
ICV	12/27/2019
ICB	12/27/2019

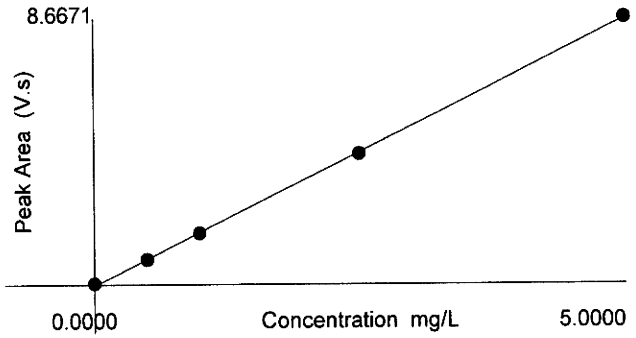
Author: wcins

Date : 1/7/2020

Table : 1 (N-TK)

	Known Conc. (mg/L)	Rep.	Peak Area (V.s)	Peak Height (V)	% RSD	% Residual	Det. Conc (mg/L)	Detection Date	Detection Time
1	5.0000	1	8.6671	0.7846	0.0	-0.4	5.0199	1/7/2020	10:10:54 PM
2	2.5000	1	4.2473	0.3831	0.0	1.2	2.4688	1/7/2020	10:12:01 PM
3	1.0000	1	1.6680	0.1500	0.0	2.0	0.9801	1/7/2020	10:13:08 PM
4	0.5000	1	0.8182	0.0731	0.0	2.2	0.4896	1/7/2020	10:14:16 PM
5	0.0000	1	0.0420	0.0046			0.0416	1/7/2020	10:15:24 PM

Figure : 1 (N-TK)



Area = 1.7322 * Conc - 0.0294
Conc = 0.5772 * Area + 0.0173
Correlation Coefficient (r) = 0.99989

Weighting : None

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG489518

Date Reported: 09-Jan-20
Run ID: R1766869
Date Analyzed: 07-Jan-20
ICAL Workgroup:
Instrument ID: FIA1

WG489518ICV

Tag: Measured: 1/7/2020 10:16:33 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND	3.91	1		mg/L	++	0.1	0.5			
SREV	NITROGEN TOTAL KJELDAHL	REC	98	1		%	++	0.1	0.5			

WG489518ICB

Tag: Measured: 1/7/2020 10:17:41 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND		1	U	mg/L	++	0.1	0.5			

WG489472PBS

Tag: Measured: 1/7/2020 10:18:49 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND		1	U	mg/Kg	++	0.1	0.5			

WG489472LFB

Tag: Measured: 1/7/2020 10:19:58 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND	2.49	1		mg/Kg	++	0.1	0.5			
SREV	NITROGEN TOTAL KJELDAHL	REC	100	1		%	++	0.1	0.5			

WG488184PBS

Tag: Measured: 1/7/2020 10:21:06 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND		1	U	mg/Kg	++	0.1	0.5			

L56331-01

Tag: Measured: 1/7/2020 10:22:14 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	2.2	1		mg/Kg	++	0.1	0.5		HD Q6 RA TB	

L56331-01MS

Tag: Measured: 1/7/2020 10:23:22 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND	4.7	1		mg/Kg	++	0.1	0.5			
SREV	NITROGEN TOTAL KJELDAHL	REC	100	1		%	++	0.1	0.5			

L56331-02

Tag: Measured: 1/7/2020 10:24:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	.5	1		mg/Kg	++	0.1	0.5		HD Q6 RA TB	

L56331-02DUP

Tag: Measured: 1/7/2020 10:25:38 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND	0.49	1	B	mg/Kg	++	0.1	0.5			
SREV	NITROGEN TOTAL KJELDAHL	RPD	2	1		%	++	0.1	0.5		RA	

L56331-03

Tag: Measured: 1/7/2020 10:26:45 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	1.8	1		mg/Kg	++	0.1	0.5		HD Q6 RA TB	

L56331-04

Tag: Measured: 1/7/2020 10:27:52 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	.6	1		mg/Kg	++	0.1	0.5		HD Q6 RA TB	

L56331-05

Tag: Measured: 1/7/2020 10:28:59 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	1.3	1		mg/Kg	++	0.1	0.5		HD Q6 RA TB	

WG489518CCV1

Tag: Measured: 1/7/2020 10:30:06 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND	2.48 ✓	1		mg/L	++	0.1	0.5			
SREV	NITROGEN TOTAL KJELDAHL	REC	99	1		%	++	0.1	0.5			

WG489518CCB1

Tag: Measured: 1/7/2020 10:31:15 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND		1	U ✓	mg/L	++	0.1	0.5			

L56331-06

Tag: Measured: 1/7/2020 10:32:22 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT		1	U	mg/Kg	++	0.1	0.5		HD Q6 RA TB	

L56331-07

Tag: Measured: 1/7/2020 10:33:28 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	1.0	1		mg/Kg	++	0.1	0.5		HD Q6 RA TB	

L56331-08

Tag: Measured: 1/7/2020 10:34:35 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	.6	1		mg/Kg	++	0.1	0.5		HD Q6 RA TB	

L56331-09

Tag: Measured: 1/7/2020 10:35:42 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	1.1	1		mg/Kg	++	0.1	0.5		HD Q6 RA TB	

WG488496PBS

Tag: Measured: 1/7/2020 10:36:49 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND		1	U	mg/Kg	++	0.1	0.5			

L56453-01

Tag: Measured: 1/7/2020 10:37:57 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	1.6	1		mg/Kg	++	0.1	0.5		HD Q6 RA TA TB	

L56453-02

Tag: Measured: 1/7/2020 10:39:06 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	1.2	1		mg/Kg	++	0.1	0.5		HD Q6 RA TA TB	

L56453-03

Tag: Measured: 1/7/2020 10:40:14 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	.2	1	B	mg/Kg	++	0.1	0.5		HD Q6 RA TA TB	

L56453-04

Tag: Measured: 1/7/2020 10:41:23 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	.2	1	B	mg/Kg	++	0.1	0.5		HD Q6 RA TA TB	

L56453-05

Tag: Measured: 1/7/2020 10:42:30 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT		1	U	mg/Kg	++	0.1	0.5		HD Q6 RA TA TB	

WG489518CCV2

Tag: Measured: 1/7/2020 10:43:37 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND	2.51	1		mg/L	++	0.1	0.5			
SREV	NITROGEN TOTAL KJELDAHL	REC	100 ✓	1		%	++	0.1	0.5			

WG489518CCB2

Tag: Measured: 1/7/2020 10:44:46 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND		1	U ✓	mg/L	++	0.1	0.5			

L56453-06

Tag: Measured: 1/7/2020 10:45:53 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	K-MWMT	.1	1	B	mg/Kg	++	0.1	0.5		HD Q6 RA TA TB	

WG489518CCV3

Tag: Measured: 1/7/2020 10:48:28 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND	2.47	1		mg/L	++	0.1	0.5			
SREV	NITROGEN TOTAL KJELDAHL	REC	99	1		%	++	0.1	0.5			

WG489518CCB3

Tag: Measured: 1/7/2020 10:49:36 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	NITROGEN TOTAL KJELDAHL	FOUND		1	U	mg/L	++	0.1	0.5			

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489518 **TKN-MWMT**

Sample	Date	SCN	OGEN TOTAL KJEL
WG489518ICV	01/07/20 22:16	WI191227-6	X
WG489518ICB	01/07/20 22:17		X
WG489472PBS	01/07/20 22:18		X
WG489472LFB	01/07/20 22:19	WI191227-2	X
WG488184PBS	01/07/20 22:21		X
L56331-01	01/07/20 22:22		X
L56331-01MS	01/07/20 22:23	WI191227-2	X
L56331-02	01/07/20 22:24		X
L56331-02DUP	01/07/20 22:25		X
L56331-03	01/07/20 22:26		X
L56331-04	01/07/20 22:27		X
L56331-05	01/07/20 22:28		X
WG489518CCV1	01/07/20 22:30	WI191227-4	X
WG489518CCB1	01/07/20 22:31		X
L56331-06	01/07/20 22:32		X
L56331-07	01/07/20 22:33		X
L56331-08	01/07/20 22:34		X
L56331-09	01/07/20 22:35		X
WG488496PBS	01/07/20 22:36		X
L56453-01	01/07/20 22:37		X
L56453-02	01/07/20 22:39		X
L56453-03	01/07/20 22:40		X
L56453-04	01/07/20 22:41		X
L56453-05	01/07/20 22:42		X
WG489518CCV2	01/07/20 22:43	WI191227-4	X
WG489518CCB2	01/07/20 22:44		X

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489518 **TKN-MWMT**

Sample	Date	SCN	OGEN TOTAL KJEL
L56453-06	01/07/20 22:45		X
WG489518CCV3	01/07/20 22:48	WI191227-4	X
WG489518CCB3	01/07/20 22:49		X

L56331-2006231417

Sulfate - Turbidimetric MWMT

QC List Type: QC-SO4-TURB
QCListMatClass: LIQUID
Bench Sheet List: I-SO4-TURB
QC Ref: SO4-TURB
Group ID: WC-G-RFA-SO4-TURB-M
Method Ref: D516-02
SOP Ref: SOPWC070

WG489857

ACZ Laboratories, Inc

Instrument ID: KONELAB
Analyst: WTC
ACZ Dept: 37
Create Date: 01/14/2020 9:36
Start Date/Time:
End Date/Time:

SEQ	ACZ ID	Client ID	SubSX	Pri	Prep Dil	EC	TDS	Analysis Date	SO4 MWMT TURB	Dilution	Comments
1	WG489857ICV	WI200102-2	MWMT		1				☑	1	
2	WG489857ICB	NONE			1				☑	1	
3	WG489857LFB	WI190801-3			1				☑	1	
4	WG488184PBS	NONE			1				☑	1	
5	L56331-01	STSB32_0.5-3			1		4630*		☑	~~5~~ 1	
6	L56331-01DUP	NONE			1				☑	~~5~~	
7	L56331-02	STSB32_6-15			1		3290*		☑	~~2~~	
8	L56331-02AS	WI190801-3			1				☑	~~2~~	
9	L56331-03	STSB34_0.5-3			1		2780*		☑	~~2~~	
10	L56331-04	STSB34_6-15			1		3810*		☑	~~2~~	
11	L56331-05	STSB33_0.5-3			1		3390*		☑	WTC ~~2~~	
12	L56331-06	STSB33_6-15			1		1110*		☑	1/14/20 1	
13	WG489857CCV1	WI200102-1			1				☑	1	
14	WG489857CCB1	NONE			1				☑	1	
15	L56331-07	STSB33-FD_0.5-3			1		3310*		☑	~~2~~ 1	
16	L56331-08	STSB35_0.5-3			1		3330*		☑	~~2~~	
17	L56331-09	STSB35_6-15			1		4910*		☑	~~5~~	
18	WG489857CCB2	NONE			1				☑	1	
19	WG489857CCV2	WI200102-1							☑		

Report Comments:

Internal Comments

AREV: WTC 1/14/20
Initials, Date

SREV: KRH 1-14-20
Initials, Date

1/14/2020 9:37:18 AM 10120

008

ACZ Laboratories, Inc.
WET CHEM INSTRUMENT DATA REVIEW CHECKLIST

AREV: WTC
Date: 1/14/2020

SREV: KRH
Date: 1-14-20

Instrument ID: Konelab

Work Group: 489857
Sample Type: SOIL TURB MWMT
Analysis Date: 1/14/2020
Analyst: WTC

	Yes	No	N/A
1) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
2) Is a current standard/reagent sheet attached to the workgroup?	✓		
3) If applicable, was sample pH at log-in receipt and/or analysis within method criteria?			✓
4) Does the instrument calibration meet the specified method criteria? (r or $r^2 \geq 0.995$)	✓		
5) Are all of the QC critera listed in LIMS within specified limits?		✓	
6) If applicable, was a passing PQV indcluded in the WG?			✓
7) Are all dilution factors correctly calculated and uploaded? (Soil, Sludges, Water)	✓		
8) Are dilutions in the appropriate range? (explain if "B" or "U" reported for sample)	✓		
9) Was sample-analysis completed within the holding time?	✓		
10) Are all applicable qualifiers transferred from bench sheet to LIMS?			✓
11) **For soil/sludge analyses:** Was a hand calculated % recovery performed for LFM/MS/AS?			✓
12) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		

Continuing Calibration? —

Calibration WG: —

Prep WG#: 488184

Disposable Vessel Lot#*: 05-527-45

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
331-02/AS	>4x spike	M3

Comments:

*Workgroup documentation must include the lot number(s) of all disposable vessels used for volumetric measurements.

Sulfate - Turbidimetric MWMT

QC List Type: QC-SO4-TURB
QCListMatClass: LIQUID
Bench Sheet List: I-SO4-TURB
QC Ref: SO4-TURB
Group ID: WC-G-RFA-SO4-TURB-M
Method Ref: D516-02
SOP Ref: SOPWC070

WG489857

ACZ Laboratories, Inc

Instrument ID: KONELAB
Analyst:
ACZ Dept: 37
Create Date: 01/14/2020 9:36
Start Date/Time:
End Date/Time:

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/14/2020 9:37:18 AM 10120

L56331-2006231417

Meteoric Water Mobility

WG488184

ACZ Laboratories, Inc

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 17:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE															
2	WG488184CSTD2	NONE															
3	WG488184CSTD3	NONE															
4	WG488184ICV	PCN58503															
5	WG488184PBS	NONE	AS REC		12/18/19 17:59		4.89		6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
6	L56331-01	STSB32_0.5-3	AS REC		12/17/19 7:00	0	4.89	23	4.16	4.2	5000	5017	11.3	12/17/19 8:45	12/18/19 13:30	28.7499999999418	19.3
7	L56331-02	STSB32_6-15	AS REC		12/17/19 8:35	0	4.89	23	5.33	5.48	5000	5000.7	20.37	12/17/19 8:45	12/18/19 14:00	29.25	19.9
8	L56331-03	STSB34_0.5-3	AS REC		12/17/19 10:10	0	4.89	23	4.94	4.9	5000	5003	10.64	12/17/19 8:45	12/18/19 13:34	28.8166666666511	19.9
9	L56331-04	STSB34_6-15	AS REC		12/17/19 11:46	0	4.89	23	5.26	5.38	5000	5003.4	19.98	12/17/19 8:45	12/18/19 13:35	28.8333333331975	19.8
10	L56331-05	STSB33_0.5-3	AS REC		12/17/19 13:21	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
11	L56331-05MS1	MS191119-5	AS REC		12/17/19 14:57	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
12	L56331-05MSD1	MS191119-5	AS REC		12/17/19 18:08	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
13	L56331-05MS2	II191204-3	AS REC		12/17/19 16:32	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
14	L56331-05MSD2	II191204-3	AS REC		12/17/19 19:43	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
15	WG488184CCV1	PCN58503	AS REC		12/18/19 3:40		4.06		4.07	4.08							19.8
16	L56331-06	STSB33_6-15	AS REC		12/17/19 21:19	0	4.89	23	7.07	7.34	5000	5009.7	21.6	12/17/19 8:45	12/18/19 16:00	31.2499999998836	19.2
17	L56331-07	STSB33-FD_0.5-3	AS REC		12/17/19 22:54	0	4.89	23	4.28	4.34	5000	5000.3	16.22	12/17/19 8:45	12/18/19 14:25	29.6666666666279	19.2
18	L56331-08	STSB35_0.5-3	AS REC		12/18/19 0:29	0	4.89	23	4.25	4.21	5000	5000	11.69	12/17/19 8:45	12/18/19 14:15	29.4999999999418	19.2
19	L56331-09	STSB35_6-15	AS REC		12/18/19 2:05	0	4.89	23	3.87	3.8	5000	5004.4	11.16	12/17/19 8:45	12/18/19 14:15	29.4999999999418	19.4
20	WG488184ICV1		AS REC		12/18/19 13:13		3.97		3.97	3.97							20.1
20	WG488184LFB1	II191204-3	AS REC		12/18/19 14:49	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
21	WG488184LFB2	MS191119-5	AS REC		12/18/19 16:24	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

1/14/2020 11:45:59 AM 10120

ACZ LABORATORIES, INC
2773 Downhill Drive
Steamboat Springs, CO 80487

WET CHEMISTRY INSTRUMENT REAGENTS INFORMATION

Instrument: Konelab

Parameter: SO4 Turbidimetric

Working Standards Preparation: See SOP

Instrument Reagents	**SCN**	**Open By:**	**Expiration Date:**
1) Barium Chloride Conditioning Rgt	PCN60515	wtc	6/30/2020

*All Standards and Reagents prepared according to effective version of SOPWC070.

Standard	Creation Date	Exp Date
C1	1/2/2020	1/16/2020
C2	1/2/2020	1/16/2020
C3	1/2/2020	1/16/2020
C4	1/2/2020	1/16/2020
C5	1/2/2020	1/16/2020
C6	1/2/2020	1/16/2020
C7	1/2/2020	1/16/2020
ICV	1/2/2020	1/16/2020

ACZ Laboratory
Konelab User

14.01.2020 10:38

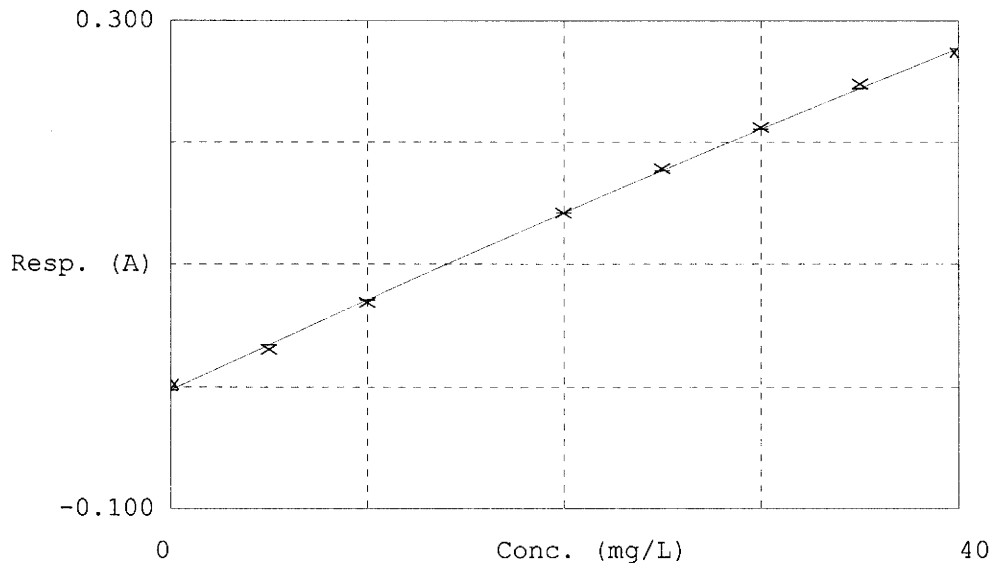
Test Sulfate

Accepted 14.01.2020 10:38

Resp. = A * Conc. ^ 2 + B * Conc. + C
A = 0
B = 0.007
C = -0.002

Coeff. of det. 0.999001

Errors



	Calibrator	Response	Calc. con.	Conc.	Errors
1	SO4-0	0.002	0.570005	0.000000	
2	SO4-5	0.031	4.444810	5.000000	
3	SO4-10	0.069	9.657462	10.000000	
4	SO4-20	0.142	19.950218	20.000000	
5	SO4-25	0.178	25.217415	25.000000	
6	SO4-30	0.212	30.207201	30.000000	
7	SO4-35	0.248	35.535278	35.000000	
8	SO4-40	0.273	39.419975	40.000000	
9	SO4-ICB(control	0.002	0.573735	0.000000	
10	SO4-ICV(control	0.143	20.088551	20.000000	

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG489857

Date Reported: 14-Jan-20
Run ID: R1767748
Date Analyzed: 14-Jan-20
ICAL Workgroup:
Instrument ID: KONELAB

WG489857ICB

Tag: Measured: 1/14/2020 10:38:50 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U ✓	mg/L	++	1	5			

WG489857ICV

Tag: Measured: 1/14/2020 10:38:51 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	20.1 ✓	1		mg/L	++	1	5			
SREV	SULFATE	REC	101	1		%	++	1	5			

WG489857CCV1

Tag: Measured: 1/14/2020 10:56:38 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	24 ✓	1		mg/L	++	1	5			
SREV	SULFATE	REC	96	1		%	++	1	5			

WG489857CCB1

Tag: Measured: 1/14/2020 10:56:39 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U	mg/L	++	1	5			

WG488184PBS

Tag: 1 Measured: 1/14/2020 10:56:41 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U ✓	mg/L	++	1	5			

WG489857CCV2

Tag: Measured: 1/14/2020 10:57:52 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	25.6 ✓	1		mg/L	++	1	5			
SREV	SULFATE	REC	102	1		%	++	1	5			

WG489857CCB2

Tag: Measured: 1/14/2020 10:57:53 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U	mg/L	++	1	5			

WG489857CCV3

Tag: Measured: 1/14/2020 11:15:36 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	25.5 ✓	1		mg/L	++	1	5			
SREV	SULFATE	REC	102	1		%	++	1	5			

WG489857CCB3

Tag: Measured: 1/14/2020 11:15:37 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U ✓	mg/L	++	1	5			

L56331-06 Tag: 1 Measured: 1/14/2020 11:15:41 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	MT-TURB	688	20		mg/L	++	20	100		HD M3 TB	

WG489857CCV4 Tag: Measured: 1/14/2020 11:17:34 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	26.2 ✓	1		mg/L	++	1	5			
SREV	SULFATE	REC	105	1		%	++	1	5			

WG489857CCB4 Tag: Measured: 1/14/2020 11:17:35 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U ✓	mg/L	++	1	5			

WG489857CCV5 Tag: Measured: 1/14/2020 11:30:14 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	24.1	1		mg/L	++	1	5			
SREV	SULFATE	REC	96 ✓	1		%	++	1	5			

WG489857CCB5 Tag: Measured: 1/14/2020 11:30:15 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U ✓	mg/L	++	1	5			

L56331-01 Tag: 1 Measured: 1/14/2020 11:30:16 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	MT-TURB	2920	120		mg/L	++	120	600		HD M3 TB	

L56331-01DUP Tag: 1 Measured: 1/14/2020 11:30:17 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	3170 ✓	120		mg/L	++	120	600			
SREV	SULFATE	RPD	8 ✓	120		%	++	120	600			

L56331-03 Tag: 1 Measured: 1/14/2020 11:30:19 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	MT-TURB	1890	120		mg/L	++	120	600		HD M3 TB	

L56331-02 Tag: 1 Measured: 1/14/2020 11:32:06 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	MT-TURB	2160	120		mg/L	++	120	600		HD M3 TB	

L56331-02AS Tag: 1 Measured: 1/14/2020 11:32:07 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	2150 ✓	120		mg/L	++	120	600			
SREV	SULFATE	REC	-100 4x	120		%	ALRT	120	600		M3	

L56331-04 Tag: 1 Measured: 1/14/2020 11:32:07 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	MT-TURB	2470	120		mg/L	++	120	600		HD M3 TB	

L56331-05 Tag: 1 Measured: 1/14/2020 11:32:08 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	MT-TURB	2210	120		mg/L	++	120	600		HD M3 TB	

L56331-07 Tag: 1 Measured: 1/14/2020 11:32:09 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	MT-TURB	2110	120		mg/L	++	120	600		HD M3 TB	

WG489857CCV6 Tag: Measured: 1/14/2020 11:32:11 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	25.2	1		mg/L	++	1	5			
SREV	SULFATE	REC	101 ✓	1		%	++	1	5			

WG489857CCB6 Tag: Measured: 1/14/2020 11:32:12 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U ✓	mg/L	++	1	5			

L56331-08 Tag: 1 Measured: 1/14/2020 11:33:05 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	MT-TURB	1940	120		mg/L	++	120	600		HD M3 TB	

L56331-09 Tag: 1 Measured: 1/14/2020 11:33:06 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	MT-TURB	3200	120		mg/L	++	120	600		HD M3 TB	

WG489857CCV7 Tag: Measured: 1/14/2020 11:33:57 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	23.8 ✓	1		mg/L	++	1	5			
SREV	SULFATE	REC	95	1		%	++	1	5			

WG489857CCB7 Tag: Measured: 1/14/2020 11:33:58 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U ✓	mg/L	++	1	5			

WG489857LFB Tag: Measured: 1/14/2020 11:35:24 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	10.5 ✓	1		mg/L	++	1	5			
SREV	SULFATE	REC	105	1		%	++	1	5			

WG489857CCV8 Tag: Measured: 1/14/2020 11:35:59 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND	25.6	1		mg/L	++	1	5			
SREV	SULFATE	REC	102 ✓	1		%	++	1	5			

WG489857CCB8 Tag: Measured: 1/14/2020 11:36:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	SULFATE	FOUND		1	U ✓	mg/L	++	1	5			

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489857 **Sulfate - Turbidimetric MWMT**

Sample	Date	SCN	SULFATE
WG489857ICV	01/14/20 10:38	WI200102-2	X
WG489857ICB	01/14/20 10:38		X
WG489857CCV1	01/14/20 10:56	WI200102-1	X
WG489857CCB1	01/14/20 10:56		X
WG488184PBS	01/14/20 10:56		X
WG489857CCB2	01/14/20 10:57		X
WG489857CCV2	01/14/20 10:57	WI200102-1	X
L56331-06	01/14/20 11:15		X
WG489857CCB3	01/14/20 11:15		X
WG489857CCV3	01/14/20 11:15	WI200102-1	X
WG489857CCB4	01/14/20 11:17		X
WG489857CCV4	01/14/20 11:17	WI200102-1	X
WG489857CCB5	01/14/20 11:30		X
L56331-01	01/14/20 11:30		X
L56331-01DUP	01/14/20 11:30		X
L56331-03	01/14/20 11:30		X
WG489857CCV5	01/14/20 11:30	WI200102-1	X
WG489857CCB6	01/14/20 11:32		X
L56331-07	01/14/20 11:32		X
L56331-02AS	01/14/20 11:32	SO4TURB120 X	X
WG489857CCV6	01/14/20 11:32	WI200102-1	X
L56331-04	01/14/20 11:32		X
L56331-05	01/14/20 11:32		X
L56331-02	01/14/20 11:32		X
L56331-08	01/14/20 11:33		X
L56331-09	01/14/20 11:33		X

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Wet Chemistry

WG489857 **Sulfate - Turbidimetric MWMT**

Sample	Date	SCN	SULFATE
WG489857CCV7	01/14/20 11:33	WI200102-1	X
WG489857CCB7	01/14/20 11:33		X
WG489857LFB	01/14/20 11:35	WI190801-3	X
WG489857CCV8	01/14/20 11:35	WI200102-1	X
WG489857CCB8	01/14/20 11:36		X

ACZ LABORATORIES, INC. WG488622
Radium 226 by 903.1
FRMRC030.09.18.20
RA226-LUCASCELL-LIQUID

Project:

SOP# 1498

Instrument: LucasCell
Matrix Class: LIQUID
List Type: QC-RA-226-903.1
List Function: ANALYTICAL

Analyst: djc
Dept: 55
Prep Date: 12/20/2019
Analysis Date: 12/30/2019
Start Time:
End Time:
Approved: DJC 12/31/19
Approved: TJR 12/31/19

ACZ Sample Number	Sample ID	Client ID	Sample Matrix	CPM-bkg cpm	Ba Recovery factor	E	Radium 226 Activity pCi/L	Radium 226 Error (+/-)	Radium 226 LLD pCi/L
1	WG488184PBW		SO	0.05	0.80	2.20	0.09	0.29	0.544
2	WG488184LCSW	PCN57864	SO	32.12	0.87	1.82	61.94	2.17	0.502
3	L56331-01	STSB32_0.5-3	SO	0.56	1.02	1.88	0.90	0.34	0.307
4	L56331-02	STSB32_6-15	SO	0.48	0.96	2.13	0.71	0.41	0.369
5	L56331-03	STSB34_0.5-3	SO	0.91	1.00	2.22	1.24	0.39	0.403
6	L56331-04	STSB34_6-15	SO	1.16	0.99	2.22	1.60	0.36	0.424
7	L56331-05	STSB33_0.5-3	SO	0.86	1.03	2.19	1.19	0.42	0.496
8	L56331-06	STSB33_6-15	SO	0.82	1.00	2.03	1.22	0.31	0.098
9	L56331-07	STSB33-FD_0.5	SO	0.53	1.02	2.04	0.79	0.36	0.363
10	L56331-08	STSB35_0.5-3	SO	0.93	0.99	2.04	1.40	0.40	0.319
11	L56331-09	STSB35_6-15	SO	0.77	1.01	2.22	1.05	0.35	0.320
12	L56331-01DUP		SO	0.92	0.98	2.27	1.25	0.36	0.233
13	L56331-02MS	PCN57864	SO	49.02	0.99	2.36	62.95	1.77	0.267
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A

~~26-WG488184GCV2~~ PCN58503 AQ
TJR 12/31/19

Rn222 Decay constant= 0.00755

488622

Bubbler ID	ACZ Sample Number	Volume ml	Rn Ingrow (mm/dd/yyyy hh:mm)	Rn Decay (mm/dd/yyyy hh:mm)	Rn Count (mm/dd/yyyy hh:mm)	Ingrow Time	Decay Time	Cell#	Counts	ICP RESULT
	WG488184PBW	300	12/26/2019 12:45	12/30/2019 12:48	12/30/2019 17:57	96.05	5.15	27	39	1.284
	WG488184LCSW	300	12/26/2019 12:45	12/30/2019 12:53	12/30/2019 17:57	96.13	5.07	28	3252	1.388
	L56331-01	300	12/26/2019 12:45	12/30/2019 12:58	12/30/2019 17:57	96.22	4.98	29	86	1.633
	L56331-02	300	12/26/2019 12:45	12/30/2019 13:03	12/30/2019 17:57	96.30	4.90	30	125	1.537
	L56331-03	300	12/26/2019 12:45	12/30/2019 13:08	12/30/2019 17:57	96.38	4.82	31	154	1.605
	L56331-04	300	12/26/2019 12:53	12/30/2019 13:13	12/30/2019 17:57	96.33	4.73	32	148	1.586
	L56331-05	300	12/26/2019 12:53	12/30/2019 13:18	12/30/2019 17:57	96.42	4.65	33	165	1.642
	L56331-06	300	12/26/2019 12:53	12/30/2019 13:23	12/30/2019 17:57	96.50	4.57	34	97	1.596
	L56331-07	300	12/26/2019 12:53	12/30/2019 13:28	12/30/2019 17:57	96.58	4.48	35	103	1.628
	L56331-08	300	12/26/2019 12:53	12/30/2019 13:33	12/30/2019 17:57	96.67	4.40	36	141	1.576
	L56331-09	300	12/26/2019 13:01	12/30/2019 13:38	12/30/2019 17:57	96.62	4.32	37	124	1.622
	L56331-01DUP	300	12/26/2019 13:01	12/30/2019 13:43	12/30/2019 17:57	96.70	4.23	38	140	1.565
	L56331-02MS	300	12/26/2019 13:01	12/30/2019 13:48	12/30/2019 17:57	96.78	4.15	39	4932	1.588
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			

Lucas Cell calibration standards and ludlum counter standards

Lucas cells are calibrated with 1 mL of Ra226 PCN52427 at 40pCi/mL.

The performance of the Lucas cell is checked with ZnS paper and

Th230 PCN# 22288

Cell#	Net CPM	DPM Ra226	Rn Ingrowth	Rn Decay	Count time	Ingrowth time	Decay Time	E=(cpm/dpm)	STDEV	Background taken	
1	170.85	88.80	9/16/2019 8:05	9/27/2019 7:56	9/27/2019 12:33	263.85	4.62	2.31	0.11	Bkg for Cell#1	
2	117.03	88.80	8/29/2019 11:27	9/4/2019 7:50	9/4/2019 12:46	140.38	4.93	2.09	0.06	Bkg for Cell#2	
3	107.23	88.80	8/29/2019 11:27	9/4/2019 7:55	9/4/2019 12:46	140.47	4.85	1.92	0.07	Bkg for Cell#3	
4	113.8	88.80	8/29/2019 11:27	9/4/2019 8:00	9/4/2019 12:46	140.55	4.77	2.03	0.09	Bkg for Cell#4	
5	125.23	88.80	8/29/2019 11:27	9/4/2019 8:05	9/4/2019 12:46	140.63	4.68	2.23	0.05	Bkg for Cell#5	
6	101.12	88.80	8/29/2019 11:35	9/4/2019 8:10	9/4/2019 12:46	140.58	4.60	1.80	0.09	Bkg for Cell#6	
7	127.92	88.80	8/29/2019 11:35	9/4/2019 8:15	9/4/2019 12:46	140.67	4.52	2.28	0.09	Bkg for Cell#7	
8	107.56	88.80	8/29/2019 11:35	9/4/2019 8:20	9/4/2019 12:46	140.75	4.43	1.91	0.04	Bkg for Cell#8	
9	110.9	88.80	8/29/2019 11:35	9/4/2019 8:25	9/4/2019 12:46	140.83	4.35	1.97	0.06	Bkg for Cell#9	
10	131.09	88.80	8/29/2019 11:35	9/4/2019 8:30	9/4/2019 12:46	140.92	4.27	2.33	0.05	Bkg for Cell#10	
11	112.8	88.80	8/29/2019 11:45	9/4/2019 8:35	9/4/2019 12:46	140.83	4.18	2.00	0.07	Bkg for Cell#11	
12	131.7	88.80	8/29/2019 11:45	9/4/2019 8:40	9/4/2019 12:46	140.92	4.10	2.34	0.06	Bkg for Cell#12	
13	124.83	88.80	8/29/2019 11:45	9/4/2019 8:45	9/4/2019 12:46	141.00	4.02	2.21	0.09	Bkg for Cell#13	
14	121.48	88.80	8/29/2019 11:45	9/4/2019 8:50	9/4/2019 14:33	141.08	5.72	2.18	0.08	Bkg for Cell#14	
15	120.68	88.80	8/29/2019 11:45	9/4/2019 8:55	9/4/2019 14:33	141.17	5.63	2.16	0.04	Bkg for Cell#15	
16	104.93	88.80	8/29/2019 11:56	9/4/2019 9:00	9/4/2019 14:33	141.07	5.55	1.88	0.05	Bkg for Cell#16	
17	115.41	88.80	8/29/2019 11:56	9/4/2019 9:05	9/4/2019 14:33	141.15	5.47	2.07	0.06	Bkg for Cell#17	
18	122.9	88.80	8/29/2019 11:56	9/4/2019 9:10	9/4/2019 14:33	141.23	5.38	2.20	0.06	Bkg for Cell#18	
19	165.44	88.80	9/16/2019 8:10	9/27/2019 8:01	9/27/2019 12:33	263.85	4.53	2.23	0.11	Bkg for Cell#19	
20	133.3	88.80	8/29/2019 11:56	9/4/2019 9:20	9/4/2019 14:33	141.40	5.22	2.38	0.03	Bkg for Cell#20	
21	108.21	88.80	8/29/2019 12:03	9/4/2019 9:25	9/4/2019 14:33	141.37	5.13	1.93	0.06	Bkg for Cell#21	
22	120.37	88.80	8/29/2019 12:03	9/4/2019 9:30	9/4/2019 14:33	141.45	5.05	2.15	0.11	Bkg for Cell#22	
23	129.48	88.80	8/29/2019 12:03	9/4/2019 9:35	9/4/2019 14:33	141.53	4.97	2.31	0.08	Bkg for Cell#23	
24	125.2	88.80	8/29/2019 12:03	9/4/2019 9:40	9/4/2019 14:33	141.62	4.88	2.23	0.05	Bkg for Cell#24	
25	126.41	88.80	8/29/2019 12:03	9/4/2019 9:45	9/4/2019 14:33	141.70	4.80	2.25	0.08	Bkg for Cell#25	
26	124.61	88.80	9/4/2019 7:45	9/10/2019 7:44	9/10/2019 12:45	143.98	5.02	2.20	0.04	Bkg for Cell#26	
27	124.47	88.80	9/4/2019 7:50	9/10/2019 7:49	9/10/2019 12:45	143.98	4.93	2.20	0.07	Bkg for Cell#27	0.34
28	103.18	88.80	9/4/2019 7:55	9/10/2019 7:54	9/10/2019 12:45	143.98	4.85	1.82	0.06	Bkg for Cell#28	0.40
29	106.9	88.80	9/4/2019 8:00	9/10/2019 7:59	9/10/2019 12:45	143.98	4.77	1.88	0.04	Bkg for Cell#29	0.30
30	121.25	88.80	9/4/2019 8:05	9/10/2019 8:04	9/10/2019 12:45	143.98	4.68	2.13	0.05	Bkg for Cell#30	0.77
31	126.45	88.80	9/4/2019 8:10	9/10/2019 8:09	9/10/2019 12:45	143.98	4.60	2.22	0.06	Bkg for Cell#31	0.63
32	126.25	88.80	9/4/2019 8:15	9/10/2019 8:14	9/10/2019 12:45	143.98	4.52	2.22	0.07	Bkg for Cell#32	0.32
33	124.59	88.80	9/4/2019 8:20	9/10/2019 8:19	9/10/2019 12:45	143.98	4.43	2.19	0.08	Bkg for Cell#33	0.79
34	115.9	88.80	9/4/2019 8:25	9/10/2019 8:24	9/10/2019 12:45	143.98	4.35	2.03	0.01	Bkg for Cell#34	0.15
35	116.04	88.80	9/4/2019 8:30	9/10/2019 8:29	9/10/2019 12:45	143.98	4.27	2.04	0.05	Bkg for Cell#35	0.50
36	116.22	88.80	9/4/2019 8:35	9/10/2019 8:34	9/10/2019 12:45	143.98	4.18	2.04	0.05	Bkg for Cell#36	0.48
37	126.74	88.80	9/4/2019 8:40	9/10/2019 8:39	9/10/2019 12:45	143.98	4.10	2.22	0.05	Bkg for Cell#37	0.47
38	129.47	88.80	9/4/2019 8:45	9/10/2019 8:44	9/10/2019 12:45	143.98	4.02	2.27	0.04	Bkg for Cell#38	0.48
39	133.03	88.80	9/4/2019 8:50	9/10/2019 8:49	9/10/2019 14:30	143.98	5.68	2.36	0.04	Bkg for Cell#39	0.30
40	118.17	88.80	9/4/2019 8:55	9/10/2019 8:54	9/10/2019 14:30	143.98	5.60	2.09	0.05	Bkg for Cell#40	
41	121.5	88.80	9/4/2019 9:00	9/10/2019 8:59	9/10/2019 14:30	143.98	5.52	2.15	0.05	Bkg for Cell#41	
42	122.3	88.80	9/4/2019 9:05	9/10/2019 9:04	9/10/2019 14:30	143.98	5.43	2.16	0.19	Bkg for Cell#42	
43	120.75	88.80	9/4/2019 9:10	9/10/2019 9:09	9/10/2019 14:30	143.98	5.35	2.14	0.04	Bkg for Cell#43	
44	161.85	88.80	8/29/2019 12:09	9/10/2019 9:14	9/10/2019 14:30	285.08	5.27	2.15	0.05	Bkg for Cell#44	
45	127.67	88.80	9/4/2019 9:20	9/10/2019 9:19	9/10/2019 14:30	143.98	5.18	2.26	0.05	Bkg for Cell#45	
46	119.25	88.80	9/4/2019 9:25	9/10/2019 9:24	9/10/2019 14:30	143.98	5.10	2.11	0.06	Bkg for Cell#46	
47	117.47	88.80	9/4/2019 9:30	9/10/2019 9:29	9/10/2019 14:30	143.98	5.02	2.07	0.06	Bkg for Cell#47	
48	121.02	88.80	9/4/2019 9:35	9/10/2019 9:34	9/10/2019 14:30	143.98	4.93	2.13	0.14	Bkg for Cell#48	
49	117.59	88.80	9/4/2019 9:40	9/10/2019 9:39	9/10/2019 14:30	143.98	4.85	2.07	0.10	Bkg for Cell#49	
50	133.68	88.80	9/4/2019 9:45	9/10/2019 9:44	9/10/2019 14:30	143.98	4.77	2.35	0.12	Bkg for Cell#50	
51	123.22	88.80	9/10/2019 7:44	9/16/2019 8:00	9/16/2019 13:01	144.27	5.02	2.17	0.04	Bkg for Cell#51	
52	130.7	88.80	9/10/2019 7:49	9/16/2019 8:05	9/16/2019 13:01	144.27	4.93	2.30	0.04	Bkg for Cell#52	
53	131.17	88.80	9/10/2019 7:54	9/16/2019 8:10	9/16/2019 13:01	144.27	4.85	2.31	0.03	Bkg for Cell#53	
54	133.89	88.80	9/10/2019 7:59	9/16/2019 8:15	9/16/2019 13:01	144.27	4.77	2.36	0.06	Bkg for Cell#54	
55	120.38	88.80	9/10/2019 8:04	9/16/2019 8:20	9/16/2019 13:01	144.27	4.68	2.12	0.07	Bkg for Cell#55	
56	110.28	88.80	9/10/2019 8:09	9/16/2019 8:25	9/16/2019 13:01	144.27	4.60	1.94	0.05	Bkg for Cell#56	
57	127.43	88.80	9/10/2019 8:14	9/16/2019 8:30	9/16/2019 13:01	144.27	4.52	2.24	0.07	Bkg for Cell#57	
58	119.94	88.80	9/10/2019 8:19	9/16/2019 8:35	9/16/2019 13:01	144.27	4.43	2.10	0.09	Bkg for Cell#58	
59	123.07	88.80	9/16/2019 8:15	9/27/2019 8:06	9/27/2019 12:33	263.85	4.45	1.66	0.05	Bkg for Cell#59	
60	133.53	88.80	9/10/2019 8:29	9/16/2019 8:45	9/16/2019 13:01	144.27	4.27	2.34	0.06	Bkg for Cell#60	
61	123.53	88.80	9/10/2019 8:34	9/16/2019 8:50	9/16/2019 13:01	144.27	4.18	2.16	0.07	Bkg for Cell#61	
62	136.02	88.80	9/10/2019 8:39	9/16/2019 8:55	9/16/2019 13:01	144.27	4.10	2.38	0.08	Bkg for Cell#62	
63	126.61	88.80	9/10/2019 8:44	9/16/2019 9:00	9/16/2019 13:01	144.27	4.02	2.21	0.03	Bkg for Cell#63	
64	131.52	88.80	9/10/2019 8:49	9/16/2019 9:05	9/16/2019 14:48	144.27	5.72	2.33	0.05	Bkg for Cell#64	
65	138.29	88.80	9/10/2019 13:58	9/16/2019 9:10	9/16/2019 14:48	139.20	5.63	2.50	0.02	Bkg for Cell#65	
66	131.65	88.80	9/10/2019 8:59	9/16/2019 9:15	9/16/2019 14:48	144.27	5.55	2.33	0.08	Bkg for Cell#66	
67	125.15	88.80	9/10/2019 9:04	9/16/2019 9:20	9/16/2019 14:48	144.27	5.47	2.21	0.08	Bkg for Cell#67	
68	128.05	88.80	9/10/2019 9:09	9/16/2019 9:25	9/16/2019 14:48	144.27	5.38	2.26	0.13	Bkg for Cell#68	
69	117.75	88.80	9/10/2019 9:14	9/16/2019 9:30	9/16/2019 14:48	144.27	5.30	2.08	0.09	Bkg for Cell#69	
70	137.74	88.80	9/10/2019 9:19	9/16/2019 9:35	9/16/2019 14:48	144.27	5.22	2.43	0.14	Bkg for Cell#70	
71	119.94	88.80	9/10/2019 9:24	9/16/2019 9:40	9/16/2019 14:48	144.27	5.13	2.12	0.06	Bkg for Cell#71	
72	121.17	88.80	9/10/2019 9:29	9/16/2019 9:45	9/16/2019 14:48	144.27	5.05	2.14	0.08	Bkg for Cell#72	
73	131.93	88.80	9/10/2019 9:34	9/16/2019 9:50	9/16/2019 14:48	144.27	4.97	2.32	0.08	Bkg for Cell#73	
74	113.84	88.80	9/10/2019 9:39	9/16/2019 9:55	9/16/2019 14:48	144.27	4.88	2.00	0.06	Bkg for Cell#74	
75	127.39	88.80	9/10/2019 9:44	9/16/2019 10:00	9/16/2019 14:48	144.27	4.80	2.24	0.04	Bkg for Cell#75	
76	166.08	88.80	9/16/2019 8:20	9/27/2019 8:11	9/27/2019 12:33	263.85	4.37	2.24	0.03	Bkg for Cell#76	
77	148.81	88.80	9/16/2019 8:25	9/27/2019 8:16	9/27/2019 12:33	263.85	4.28	2.00	0.03	Bkg for Cell#77	
78	138.71	88.80	9/16/2019 8:30	9/27/2019 8:21	9/27/2019 12:33	263.85	4.20	1.87	0.04	Bkg for Cell#78	

ACZ Laboratories, Inc.
Radiochemistry Data Review Checklist

Data Reviewer: DJZ
Date: 12/31/19

Approved: TJR
Date: 12/31/19

Work Group: 488622
Sample Type: SO
Analysis Date: 12/30/19
Analyst: DJZ
Prep Date: 12/20/19

Weekly background file: 12/22/19
Daily background file: N/A

GAB dry date/time: N/A

Alpha performance file: 12/30/19
Beta performance file: N/A

	Yes	No	NA
1) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		
2) **FOR SREV:** For 903.1 WG's only, was the ICP Barium recovery raw data merged with the WG in LIMS?	✓		
3) Does the workgroup include all required QC samples?	✓		
4) Are all QC criteria listed in LIMS within specified limits?		✓	
5) Does all QC have the correct nomenclature (PBS vs PBW, etc.)?	✓		
6) For GABs: Beta LCS/MS deleted from Alpha & Alpha LCS/MS deleted from Beta?			✓
7) Are all PCNs / SCNs used for LIMS calculations entered correctly?	✓		
8) Have all transcriptions been reviewed for accuracy (e.g. volumes, BG's, sx counts, etc.)?	✓		
9) Are samples flagged for INSX, if applicable?			✓
10) Is any sample analyzed using less volume appropriately "D" qualified?			✓
11) Are all calculations based on the correct matrix?	✓		
12) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
13 Is a current standard/reagent sheet attached to the workgroup?	✓		
14) Are all associated WG benchsheets locked for editing?	✓		
15) For GAB WG's containing DW samples, did at least 72 hours elapse between end of drying and start of counting?			✓
16) Are all tracer or carrier recoveries within acceptable limits?	✓		
17) For Lead-210 WG's, are the counts off the instrument in gross counts?			✓
18) Is the correct instrument ID on the WG benchsheet, and does it correspond with the template and raw data?	✓		

QC limits *

Analyte	PBW	LCS & MS
gross alpha	2*LLD	67-144
gross beta	2*LLD	82-122
Ra-226 (903.1)	2*LLD	43-148
Alpha emitting Ra isotopes	2*LLD	66-132
Ra-228	2*LLD	47-123
Pb-210	2*LLD	55-121
Th	2*LLD	91-126
U-234	2*LLD	77-122
U-235	2*LLD	42-136
U-238	2*LLD	87-124
Po-210	2*LLD	51-128
GAMMA	2*LLD	90-110
Rn-222	2*LLD	90-110

Tracer/Carrier QC Limits

Tracer/Carrier	%Rec
Ra-228 (Ba & Y)	40-130
Alpha emitting Ra isotopes (Ba)	40-130
Ra-226 903.1 (Ba)	40-130
U-232	30-130
Po-209	25-130
Pb-210	30-130
Th-229	30-130

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action
L56331-1DUP	RPD out. Duplicated 5x<5x LLD. RER used for assessment	RA

Comments:

LCS MS limits developed from combined control chart data for LCSW LCSS.

ACZ LABORATORIES, INC. WG488622
Radium 226 by 903.1
FRMRC030.09.18.20
RA226-LUCASCELL-LIQUID

Project:

SOP# 1498

Instrument: LucasCell
Matrix Class: LIQUID
List Type: QC-RA-226-903.1
List Function: ANALYTICAL

Analyst: djc
Dept: 55
Prep Date: 12/20/2019
Analysis Date:
Start Time:
End Time:
Approved:
Approved:

ACZ Sample Number	Sample ID	Client ID	Sample Matrix	CPM-bkg cpm	Ba Recovery factor	E	Radium 226 Activity pCi/L	Radium 226 Error (+/-)	Radium 226 LLD pCi/L
1	WG488622PBW		AQ	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
2	WG488622LCSW	PCN57864	AQ	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
3	L56331-01	STSB32_0.5-3	AQ	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
4	L56331-02	STSB32_6-15	AQ	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
5	L56331-03	STSB34_0.5-3	AQ	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
6	L56331-04	STSB34_6-15	AQ	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
7	L56331-05	STSB33_0.5-3	NA	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
8	L56331-06	STSB33_6-15	SO	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
9	L56331-07	STSB33-FD_0.5	SO	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
10	L56331-08	STSB35_0.5-3	SO	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
11	L56331-09	STSB35_6-15	SO	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
12	L56331-01 DUP	STSB34_0.5-3	SO	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
13	L56331-02 MS	STSB34_6-15	SO	#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A
				#N/A	0.00	#N/A	#N/A	#N/A	#N/A

26 WG488184CCV2 PCN58503 AQ

Rn222 Decay constant= 0.00755

Bubbler ID	ACZ Sample Number	Volume ml	Rn Ingrow (mm/dd/yyyy hh:mm)	Rn Decay (mm/dd/yyyy hh:mm)	Rn Count (mm/dd/yyyy hh:mm)	Ingrow Time	Decay Time	Cell#	Counts	ICP RESULT
			12/[illegible]/19	12/30/19	12/30/19					
prep	WG488622PBW	300	1245	1248	1757	0.00	0.00	27	39	
α	WG488622LCSW			1253		0.00	0.00	28	3252	
trick	L56331-01			1258		0.00	0.00	29	86	
A	L56331-02			1303		0.00	0.00	30	125	
–	L56331-03			1308		0.00	0.00	31	154	
cono	L56331-04		1253	1313		0.00	0.00	32	148	
Sr	L56331-05			1318		0.00	0.00	33	165	
Cm	L56331-06			1323		0.00	0.00	34	97	
bomr	L56331-07			1328		0.00	0.00	35	103	
stand	L56331-08			1333		0.00	0.00	36	141	
S–	L56331-09		1301	1338		0.00	0.00	37	124	
Y	L56331-01			1343		0.00	0.00	38	140	
Agg	L56331-02			1348		0.00	0.00	39	4932	
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			
	0					0.00	0.00			

Lucas Cell calibration standards and ludlum counter standards

Lucas cells are calibrated with 1 mL of Ra226 PCN52427 at 40pCi/mL.

The performance of the Lucas cell is checked with ZnS paper and

Th230 PCN# 22288

ACZ LABORATORIES, INC.
Standards/Reagents Information
Radium 226 903.1
Water

WG488622.xlsx

ANALYST:
Second analyst:
DATE TIME of prep start:

PROJECT/WG:
Method 903.1

INSTR: LUDLUM

Approved:

Radioactive Standards

LCS & MS 57867

Reagents

Barium Carrier RC191102-2

Nitric Acid, conc. 59927

EDTA RC191226-1

Sulfuric Acid, conc. 59313

Hydrochloric Acid, conc. 60350

Sulfuric Acid 0.1N 59313

Ascarite 59343

Antifoam Emulsion N/A

Magnesium perchlorate 59342

Centrifuge Tubes Lot# H9AF828118

Sodium hydroxide 10N N/A

COMMENTS:

ACZ Sample Number	Bottle ID
WG488622PBW	
WG488622LCSW	
L56331-01	
L56331-02	
L56331-03	
L56331-04	
L56331-05	
L56331-06	
L56331-07	
L56331-08	
L56331-09	
L56331-01	
L56331-02	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	

L56331-2006231417

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 18:00

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE	AS REC		12/17/19 7:00		10.08		10.08	10.08							20.1
2	WG488184CSTD2	NONE	AS REC		12/17/19 8:40		7.02		7.02	7.02							20.3
3	WG488184CSTD3	NONE	AS REC		12/17/19 10:20		2.07		2.07	2.07							20.3
4	WG488184ICV	PCN58503	AS REC		12/17/19 12:00		3.97		3.97	3.97							20.1
5	WG488184PBS	NONE	AS REC		12/17/19 13:40		4.89		6.18	6.21	0	5002.4		12/17/2019 8:45:00 AM	12/18/2019 10:20:00 AM	25.58333333326	19
6	L56331-01	STSB32_0.5-3	AS REC		12/17/19 15:20	0	4.89	23	4.16	4.2	5238	5017	11.3	12/17/2019 8:45:00 AM	12/18/2019 1:30:00 PM	28.74999999994	19.3
7	L56331-02	STSB32_6-15	AS REC		12/17/19 17:00	0	4.89	23	5.33	5.48	5700	5000.7	20.37	12/17/2019 8:45:00 AM	12/18/2019 2:00:00 PM	29.25	19.9
8	L56331-03	STSB34_0.5-3	AS REC		12/17/19 18:40	0	4.89	23	4.94	4.9	5253	5003	10.64	12/17/2019 8:45:00 AM	12/18/2019 1:34:00 PM	28.81666666665	19.9
9	L56331-04	STSB34_6-15	AS REC		12/17/19 20:20	0	4.89	23	5.26	5.38	6092	5003.4	19.98	12/17/2019 8:45:00 AM	12/18/2019 1:35:00 PM	28.83333333332	19.8
10	L56331-05	STSB33_0.5-3	AS REC		12/17/19 22:00	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
11	L56331-05MS1	MS191119-5	AS REC		12/17/19 23:40	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
12	L56331-05MSD1	MS191119-5	AS REC		12/18/19 1:20	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
13	L56331-05MS2	II191204-3	AS REC		12/18/19 3:00	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
14	L56331-05MSD2	II191204-3	AS REC		12/18/19 4:40	0	4.89	23	4.3	4.19	5341	5022	16.27	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.8
15	WG488184CCV1	PCN58503	AS REC		12/18/19 6:20		4.06		4.07	4.08							19.8
16	L56331-06	STSB33_6-15	AS REC		12/18/19 8:00	0	4.89	23	7.07	7.34	5492	5009.7	21.6	12/17/2019 8:45:00 AM	12/18/2019 4:00:00 PM	31.24999999988	19.2
17	L56331-07	STSB33-FD_0.5-3	AS REC		12/18/19 9:40	0	4.89	23	4.28	4.34	5249	5000.3	16.22	12/17/2019 8:45:00 AM	12/18/2019 2:25:00 PM	29.66666666663	19.2
18	L56331-08	STSB35_0.5-3	AS REC		12/18/19 11:20	0	4.89	23	4.25	4.21	5225	5000	11.69	12/17/2019 8:45:00 AM	12/18/2019 2:15:00 PM	29.49999999994	19.2
19	L56331-09	STSB35_6-15	AS REC		12/18/19 13:00	0	4.89	23	3.87	3.8	5382	5004.4	11.16	12/17/2019 8:45:00 AM	12/18/2019 3:20:00 PM	30.58333333331	19.4
20	WG488184LFB1	II191204-3	AS REC		12/18/19 14:40	0	4.89	23	6.18	6.21	0	5002.4		12/17/2019 8:45:00 AM	12/18/2019 10:20:00 AM	25.58333333326	19
21	WG488184LFB2	MS191119-5	AS REC		12/18/19 16:20	0	4.89	23	6.18	6.21	0	5002.4		12/17/2019 8:45:00 AM	12/18/2019 10:20:00 AM	25.58333333326	19
22	WG488184CCV2	PCN58503	AS REC		12/18/19 18:00		4.03		4.07	4.02							19.7

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/19/2019 5:19:43 PM 10120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488622

Date Reported: 31-Dec-19
Run ID: R1766232
Date Analyzed: 30-Dec-19
ICAL Workgroup:
Instrument ID: LUCASCELL

WG488184PBW

Tag: **Measured:** 12/30/2019

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	FOUND	0.09 ✓	U 1		pCi/L	++	0.54	0.29			

WG488184LCSW

Tag: **Measured:** 12/30/2019 12:01:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	FOUND	62	1		pCi/L	++	0.5	2.2	PCN57864		
SREV	RADIUM 226	REC	93 ✓	1		%	++	0.5	2.2	PCN57864		
SREV	RADIUM 226	TRUE	6666666667	1		pCi/L	++	0.5	2.2	PCN57864		

L56331-01

Tag: **Measured:** 12/30/2019 12:02:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	.1-MWMT	0.9	1		pCi/L	++	0.31	0.34		RG TB	

L56331-02

Tag: **Measured:** 12/30/2019 12:04:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	.1-MWMT	0.71	1		pCi/L	++	0.37	0.41		RG TB	

L56331-03

Tag: **Measured:** 12/30/2019 12:05:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	.1-MWMT	1.2	1		pCi/L	++	0.4	0.39		RG TB	

L56331-04

Tag: **Measured:** 12/30/2019 12:07:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	.1-MWMT	1.6	1		pCi/L	++	0.42	0.36		RG TB	

L56331-05

Tag: **Measured:** 12/30/2019 12:08:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	.1-MWMT	1.2	1		pCi/L	++	0.5	0.42		RG TB	

L56331-06

Tag: **Measured:** 12/30/2019 12:10:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	.1-MWMT	1.2	1		pCi/L	++	0.1	0.31		RG TB	

L56331-07

Tag: **Measured:** 12/30/2019 12:11:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	.1-MWMT	0.79	1		pCi/L	++	0.36	0.36		RG TB	

L56331-08

Tag: Measured: 12/30/2019 12:12:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	.1-MWMT	1.4	1		pCi/L	++	0.32	0.4		RG TB	

L56331-09

Tag: Measured: 12/30/2019 12:14:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	.1-MWMT	1.1	1		pCi/L	++	0.32	0.35		RG TB	

L56331-01DUP

Tag: Measured: 12/30/2019 12:15:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	FOUND	1.3	1		pCi/L	++	0.23	0.36			
SREV	RADIUM 226	RER	0.81	1		%	++	0.4	5		RER = 1.4	
SREV	RADIUM 226	RPD	36	1		pCi/L	ALRT	0.23	0.36		RG	

L56331-02MS

Tag: Measured: 12/30/2019 12:17:00 AM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 226	FOUND	63	1		pCi/L	++	0.27	1.8	PCN57864		
SREV	RADIUM 226	REC	93	1		%	++	0.27	1.8	PCN57864		
SREV	RADIUM 226	TRUE	6666666667	1		pCi/L	++	0.27	1.8	PCN57864		

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Run Log by Workgroup

Wood - E&I Solutions, Inc.

Project ID: L56331

Radiochemistry

WG488622 **Ra226**

Sample	Date	SCN	RADIUM 226
WG488184PBW	12/30/19 00:00		X
WG488184LCSW	12/30/19 00:01		X
L56331-01	12/30/19 00:02		X
L56331-02	12/30/19 00:04		X
L56331-03	12/30/19 00:05		X
L56331-04	12/30/19 00:07		X
L56331-05	12/30/19 00:08		X
L56331-06	12/30/19 00:10		X
L56331-07	12/30/19 00:11		X
L56331-08	12/30/19 00:12		X
L56331-09	12/30/19 00:14		X
L56331-01DUP	12/30/19 00:15		X
L56331-02MS	12/30/19 00:17		X

12/30/14 Ref JLG

1) 1187 2) 1157 3) 1145 4) 1135 5) 1202 6) 1169 7) 1230 8) 1279 9) 1179
10) 1193 11) 1174 12) 1156 13) 1084

1 49	2 38	3 22	4 22	5 29	6 32	7 22	8 67	9 61	10 25	11 44	12 33	13 31
14 97	15	16 23	17	18	19	20	21	22 83	23	24 45	25	26
27	28	29	30	31	32	33	34	35	36	37	38	39
40 [illegible]	41	42	43	44	45	46	47	48	49	50	51	52
53 48	54 25	55 46	56 58	57 75	58 62	59 42	60 76	61 64	62 45	63 27	64 13	65 [illegible]
66	67 34	68 34	69 36	70 42	71 44	72 55	73 51	74 56	75 38	76 16	77 17	78 [illegible]

12/31/14 Ref JLG

1) 1133 2) 1112 3) 1156 4) 1112 5) 1197 6) 1178 7) 1126 8) 1228 9) 1129
10) 1161 11) 1257 12) 1206 13) 1109

ACZ Laboratories, Inc.

Steamboat Springs, CO 80487

Detector 1	Detector 2	Detector 3
1074 - 1288	1092 - 1232	1064 - 1185
Detector 4	Detector 5	Detector 6
1086 - 1200	1140 - 1239	1141 - 1223
Detector 7	Detector 8	Detector 9
1119 - 1234	1121 - 1295	1100 - 1206
Detector 10	Detector 11	Detector 12
1138 - 1258	1105 - 1237	1112 - 1224
Detector 13		
1049 - 1180		

Element, Wavelength and Order	Date of Fit	Date of Cal.	Type of Fit	Weighting	A0	A1	A2	n (Exponent)
Ag 328.068 {103}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000193	0.046674	0.000000	1.000000
Al 396.152 { 85}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	-0.000058	0.032384	0.000000	1.000000
As 189.042 {478}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	-0.000012	0.001511	0.000000	1.000000
B 208.959 {461}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000059	0.007894	0.000000	1.000000
Ba 455.403 { 74}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.004428	2.947004	0.000000	1.000000
Be 313.042 {108}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.001379	2.002242	0.000000	1.000000
Bi 223.061 {451}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000129	0.001884	0.000000	1.000000
Ca 315.887 {107}	12/31/2019 3:47:27	12/31/2019 3:47:27	Linear	None	-0.005807	0.017994	0.000000	1.000000
Cd 214.438 {457}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000162	0.050743	0.000000	1.000000
Cd 226.502 {449}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000299	0.040665	0.000000	1.000000
Co 228.616 {447}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000093	0.012781	0.000000	1.000000
Cr 205.560 {464}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000263	0.017652	0.000000	1.000000
Cr 267.716 {126}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000319	0.036444	0.000000	1.000000
Cu 324.754 {104}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.001052	0.063055	0.000000	1.000000
Fe 240.488 {140}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000013	0.013287	0.000000	1.000000
Fe 259.940 {130}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000206	0.029364	0.000000	1.000000
Ga 294.364 {114}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000594	0.002987	0.000000	1.000000
K 766.490 { 44}	12/31/2019 3:47:27	12/31/2019 3:47:27	Linear	None	0.003089	0.019123	0.000000	1.000000
Li 670.784 { 50}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	-0.004422	0.502134	0.000000	1.000000
Mg 279.079 {121}	12/31/2019 3:47:27	12/31/2019 3:47:27	Linear	None	0.000308	0.003142	0.000000	1.000000
Mn 257.610 {131}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.001426	0.207753	0.000000	1.000000
Mo 202.030 {467}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000055	0.009608	0.000000	1.000000
Na 589.592 { 57}	12/31/2019 3:47:27	12/31/2019 3:47:27	Linear	None	0.012395	0.071926	0.000000	1.000000
Ni 231.604 {446}	12/31/2019 3:47:27	12/31/2019 3:47:27	Linear	None	-0.000021	0.009895	0.000000	1.000000
P 214.914 {457}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	-0.000051	0.001034	0.000000	1.000000
Pb 220.353 {453}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000086	0.002546	0.000000	1.000000
S 182.034 {485}	12/31/2019 3:47:27	12/31/2019 3:47:27	Linear	None	0.000159	0.001256	0.000000	1.000000
Sb 206.833 {463}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000017	0.001845	0.000000	1.000000
Sc 361.384 { 93}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.002219	0.773389	0.000000	1.000000
Se 196.090 {472}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000027	0.001236	0.000000	1.000000
Si 251.611 {134}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000480	0.010447	0.000000	1.000000
Si 251.611 {134}2	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000480	0.010447	0.000000	1.000000
Sn 189.989 {477}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000056	0.002253	0.000000	1.000000
Sr 421.552 { 80}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.004853	2.977853	0.000000	1.000000
Ti 334.941 {101}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000107	0.158479	0.000000	1.000000
Tl 190.856 {477}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000045	0.001631	0.000000	1.000000
V 292.402 {115}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	-0.000495	0.032910	0.000000	1.000000
Y 371.030 { 91}*	12/31/2019 3:47:27	12/31/2019 3:47:27	Linear	None	16016.591	-300.01375	0.000000	1.000000
Zn 206.200 {463}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000064	0.016076	0.000000	1.000000
Zn 213.856 {457}	12/31/2019 3:44:14	12/31/2019 3:44:14	Linear	None	0.000131	0.022092	0.000000	1.000000

Element, Wavelength and Order	Correlation	Std Error of Est	Predicted MDL	Predicted MQL	Status	Reslope		QC Norm	
						Slope	Y-int	Slope factor	Offset
Ag 328.068 {103}	0.999969	0.000258	0.006431	0.021438	OK.	1.000000	0.000000	1	0
Al 396.152 { 85}	0.999991	0.000992	0.015325	0.051085	OK.	1.000000	0.000000	1	0
As 189.042 {478}	0.999921	0.000067	0.018328	0.061094	OK.	1.000000	0.000000	1	0
B 208.959 {461}	0.999985	0.000157	0.004996	0.016653	OK.	1.000000	0.000000	1	0
Ba 455.403 { 74}	0.999999	0.005321	0.000301	0.001003	OK.	1.000000	0.000000	1	0
Be 313.042 {108}	0.999994	0.009613	0.000203	0.000677	OK.	1.000000	0.000000	1	0
Bi 223.061 {451}	0.999994	0.000024	0.023680	0.078932	OK.	1.000000	0.000000	1	0
Ca 315.887 {107}	1.000000	0.000721	0.017419	0.058062	OK.	1.000000	0.000000	1	0
Cd 214.438 {457}	0.999956	0.000676	0.000822	0.002741	OK.	1.000000	0.000000	1	0
Cd 226.502 {449}	0.999948	0.000585	0.001163	0.003878	OK.	1.000000	0.000000	1	0
Co 228.616 {447}	0.999950	0.000181	0.003383	0.011277	OK.	1.000000	0.000000	1	0
Cr 205.560 {464}	0.999948	0.000637	0.002619	0.008729	OK.	1.000000	0.000000	1	0
Cr 267.716 {126}	0.999971	0.000982	0.006617	0.022058	OK.	1.000000	0.000000	1	0
Cu 324.754 {104}	0.999998	0.000170	0.006321	0.021071	OK.	1.000000	0.000000	1	0
Fe 240.488 {140}	0.999979	0.000307	0.013931	0.046435	OK.	1.000000	0.000000	1	0
Fe 259.940 {130}	0.999971	0.000797	0.005404	0.018012	OK.	1.000000	0.000000	1	0
Ga 294.364 {114}	0.999977	0.000028	0.064641	0.215470	OK.	1.000000	0.000000	1	0
K 766.490 { 44}	1.000000	0.000859	0.052411	0.174702	OK.	1.000000	0.000000	1	0
Li 670.784 { 50}	1.000000	0.000127	0.002141	0.007138	OK.	1.000000	0.000000	1	0
Mg 279.079 {121}	0.999996	0.000503	0.057126	0.190421	OK.	1.000000	0.000000	1	0
Mn 257.610 {131}	0.999950	0.002931	0.000819	0.002729	OK.	1.000000	0.000000	1	0
Mo 202.030 {467}	0.999963	0.000117	0.003650	0.012166	OK.	1.000000	0.000000	1	0
Na 589.592 { 57}	1.000000	0.000413	0.014918	0.049726	OK.	1.000000	0.000000	1	0
Ni 231.604 {446}	1.000000	0.000000	0.004744	0.015813	OK.	1.000000	0.000000	1	0
P 214.914 {457}	0.999823	0.000069	0.040067	0.133558	OK.	1.000000	0.000000	1	0
Pb 220.353 {453}	0.999981	0.000056	0.017267	0.057558	OK.	1.000000	0.000000	1	0
S 182.034 {485}	0.999996	0.000103	0.026947	0.089824	OK.	1.000000	0.000000	1	0
Sb 206.833 {463}	0.999738	0.000060	0.020408	0.068027	OK.	1.000000	0.000000	1	0
Sc 361.384 { 93}	0.999999	0.001185	0.000544	0.001812	OK.	1.000000	0.000000	1	0
Se 196.090 {472}	0.999981	0.000027	0.026344	0.087813	OK.	1.000000	0.000000	1	0
Si 251.611 {134}	0.999992	0.000145	0.015257	0.050855	OK.	1.000000	0.000000	1	0
Si 251.611 {134}2	0.999992	0.000145	0.015257	0.050855	OK.	1.000000	0.000000	1	0
Sn 189.989 {477}	0.999972	0.000059	0.011778	0.039261	OK.	1.000000	0.000000	1	0
Sr 421.552 { 80}	0.999998	0.008172	0.000225	0.000750	OK.	1.000000	0.000000	1	0
Ti 334.941 {101}	0.999993	0.000412	0.001841	0.006135	OK.	1.000000	0.000000	1	0
Tl 190.856 {477}	0.999823	0.000217	0.023494	0.078313	OK.	1.000000	0.000000	1	0
V 292.402 {115}	0.999909	0.000302	0.006408	0.021360	OK.	1.000000	0.000000	1	0
Y 371.030 { 91}*	0.501850	316.64738	-1.000000	-1.000000	Warnin	1.000000	0.000000	1	0
Zn 206.200 {463}	0.999902	0.000318	0.002049	0.006830	OK.	1.000000	0.000000	1	0
Zn 213.856 {457}	0.999950	0.000314	0.001502	0.005008	OK.	1.000000	0.000000	1	0

CALIBRATION REAGENTS

6010/200.7 Reagent Sheet

1% Calibration Standards			10% Calibration Standards		
CLPSTD1:	**	SCN	CLPTSTD1:	**	SCN
CLPSTD2:	II191210-2	SCN	CLPTSTD2:	II191209-3	SCN
CLPSTD3:	II191209-1	SCN	CLPTSTD3:	II191230-1	SCN

Yttrium (Internal Standard) = PCN59951 EXP: 12/30/2020

**=CALSTD1 is a 2X dilution on CALSTD2 using either 1% or 10% Blank as the dilutent.

Blank Solutions:

Nitric acid:	60422	PCN	Nitric acid:	60422	PCN
Hydrochloric acid:	60374	PCN	Hydrochloric acid:	60375	PCN

VERIFIED BY: JLW 12/31/19

ICPSTD

1488867

ACZ Laboratories, Inc. **WG488867**
Radium 228 in Water
EPA 904.0/9320

xlsx1/7/2020 6:17 PM

Project:

SOP # 1495

Instrument: G542
Matrix Class: LIQUID
List Type: QC-RA-228
List Function: ANALYTICAL

Analyst: AMK
Dept: 55
Prep Date: 12/26/2019
Analysis Date: 1/7/2020
Start Time:
End Time:
Approved: AMK 1/7/20
Approved: TJR 1/8/2020

Seq #	ACZ Sample No.	Client Sample ID	Sample Volume mL	Sample Matrix	Y Planchett Weight g	Y Gross Weight g	Sample Weight g	Residue Density mg/cm³	Ba Planchett Weight g	Ba Gross Weight g	Radium 228 pCi/L	Error (+-)	LLD pCi/L
1	WG488184PBW		300	SO	9.1472	9.1737	0.0265	1.3250	9.1402	9.1953	2.09	1.98	5.12
2	WG488184LCSW	PCN57186	250	SO	9.1999	9.2258	0.0259	1.2950	9.1913	9.2453	31.50	3.91	6.44
3	L56331-01	STSB32_0.5-3	300	SO	9.165	9.1891	0.0241	1.2050	9.194	9.2458	2.16	2.53	6.07
4	L56331-01DUP		300	SO	9.1442	9.1687	0.0245	1.2250	9.1422	9.1972	2.13	2.40	5.66
5	L56331-02	STSB32_6-15	300	SO	9.1858	9.2097	0.0239	1.1950	9.2554	9.3105	4.87	2.37	5.75
6	L56331-02MS	PCN57186	300	SO	9.1946	9.2198	0.0252	1.2600	9.2001	9.2528	31.55	3.55	5.63
7	L56331-03	STSB34_0.5-3	300	SO	9.1592	9.1827	0.0235	1.1750	9.1386	9.1877	3.11	2.83	6.60
8	L56331-04	STSB34_6-15	300	SO	9.1644	9.1885	0.0241	1.2050	9.1771	9.2311	4.78	2.75	5.72
9	L56331-05	STSB33_0.5-3	300	SO	9.1566	9.1829	0.0263	1.3150	9.2167	9.2743	0.64	2.06	5.14
10	L56331-06	STSB33_6-15	300	SO	9.2073	9.2311	0.0238	1.1900	9.214	9.2666	-0.07	2.41	6.37
11	L56331-07	STSB33-FD_0.5-3	300	SO	9.1782	9.2027	0.0245	1.2250	9.1676	9.2198	2.96	2.42	5.89
12	L56331-08	STSB35_0.5-3	300	SO	9.2163	9.2409	0.0246	1.2300	9.2116	9.2672	1.76	2.45	5.80
13	L56331-09	STSB35_6-15	300	SO	9.1856	9.2109	0.0253	1.2650	9.1775	9.2326	-0.50	2.11	5.94
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Comments:

Decay Equation for Ra228:	
Standard Preparation Date	8/20/2018
Initial True Value (pCi/mL)	40.00
Decayed Value (pCi/mL)	33.85

Sr89 Calibration performed with PCN 54078

Daily performance check with SR-Y PCN 22287

ACZ Sample No.	Det.	Gross CPM	BG β	NET CPM Beta	Ingrow Time (mm/dd/yyyy hh:mm)	Decay Time (mm/dd/yyyy hh:mm)	Analysis Time (mm/dd/yyyy hh:mm)	Ingrow Time min.	Decay Time min.	Y Yield (dec %)	Enter values in only one of these two columns* Ba Rec Weight (g)	Ba Yield (dec %)	Ba Rec ICPMS (ug/L)	Total Yield (dec %)	Efficiency Beta	Radium 228 Calculations (See notes) A	B	C	D	Det.	Det. BG β
WG488184PBW	2A	2.1890	1.7560	0.4330	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.87	0.06	1.00		0.87	0.4927	1.31967	1.08717	1.00000	1.26078	1A	1.967
WG488184LCSW	2B	7.4780	2.2780	5.2000	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.85	0.05	0.98		0.83	0.4901	19.11572	1.08717	1.00000	1.26078	1B	2.2
L56331-01	2C	2.4780	2.1000	0.3780	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.79	0.05	0.94		0.74	0.4852	1.16973	1.08717	1.00000	1.26078	1C	1.711
L56331-01DUP	2D	2.5780	2.1780	0.4000	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.80	0.05	1.00		0.80	0.4817	1.24686	1.08717	1.00000	1.26078	1D	1.8
L56331-02	3A	2.6890	1.7890	0.9000	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.78	0.06	1.00		0.78	0.4862	2.77921	1.08717	1.00000	1.26078	2A	1.756
L56331-02MS	3B	8.2330	2.2780	5.9550	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.82	0.05	0.96		0.79	0.4919	18.17875	1.08717	1.00000	1.26078	2B	2.278
L56331-03	3C	2.6890	2.1890	0.5000	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.77	0.05	0.89		0.69	0.4829	1.55464	1.08717	1.00000	1.26078	2C	2.1
L56331-04	3D	3.5110	2.6220	0.8890	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.79	0.05	0.98		0.77	0.4942	2.70126	1.08717	1.00000	1.26078	2D	2.178
L56331-05	4A	2.2000	2.0670	0.1330	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.86	0.06	1.05		0.86	0.4946	0.40375	1.08717	1.00000	1.26078	3A	1.789
L56331-06	4B	1.8890	1.9000	-0.0110	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.78	0.05	0.96		0.74	0.4612	-0.03581	1.08717	1.00000	1.26078	3B	2.278
L56331-07	1A	2.5000	1.9670	0.5330	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.80	0.05	0.95		0.76	0.4878	1.64064	1.08717	1.00000	1.26078	3C	2.189
L56331-08	1B	2.5220	2.2000	0.3220	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.80	0.06	1.01		0.80	0.4685	1.03193	1.08717	1.00000	1.26078	3D	2.622
L56331-09	1C	1.6220	1.7110	-0.0890	12/27/2019 14:01	1/7/2020 12:51	1/7/2020 14:54	15770.00	123	0.83	0.06	1.00		0.83	0.4449	-0.30034	1.08717	1.00000	1.26078	4A	2.067
												0.00		0.00			1.08717			4B	1.9
												0.00		0.00			1.08717			4C	2.633
												0.00		0.00			1.08717			4D	1.522
												0.00		0.00			1.08717				
												0.00		0.00			1.08717				
												0.00		0.00			1.08717				
												0.00		0.00			1.08717				
												0.00		0.00			1.08717				
												0.00		0.00			1.08717				
												0.00		0.00			1.08717				
												0.00		0.00			1.08717				

Radium 228 Calculations

A	(Net CPM Beta * 1000) / (2.22 * Eff. Beta * Samp. Vol.)
B	(0.001884 * 90) / (1 - 2.7183 ^ (-0.001884 * 90))
C	1 / (1 - 2.7183 ^ (-0.001884 * Ingrow Time))
D	1 / (2.7183 ^ (-0.001884 * Decay Time))

*see <P:\QAQC\QA - Editable\Scanned DOC, MDL, etc\RadChem\2015\EPA904.0\"Ra228 Ba Yield Test"> for derivation of Ba true values

Beta efficiency equation factors for each of 16 G542 detectors

Efficiency Equation:
(Y = MX + B)
where
(X=Residue Density)

Detector	M	B
1A	-0.0049	0.4938
1B	-0.0012	0.4700
1C	-0.0089	0.4562
1D	-0.0034	0.4564
2A	-0.0032	0.4969
2B	-0.0019	0.4926
2C	0.0025	0.4822
2D	0.0004	0.4812
3A	0.0007	0.4854
3B	0.0000	0.4919
3C	-0.0028	0.4862
3D	-0.0056	0.5009
4A	-0.0022	0.4975
4B	0.0022	0.4586
4C	-0.0021	0.4821
4D	-0.0029	0.4916

ACZ Laboratories, Inc.
Radiochemistry Data Review Checklist

Data Reviewer: AMK
Date: 1/7/2020

Approved: TJR
Date: 1/8/2020

Work Group: 488867
Sample Type: SO
Analysis Date: 1/7/2020
Analyst: AMK
Prep Date: 12/26/19

Weekly background file: —
Daily background file: 1/7/20 854

Alpha performance file: —
Beta performance file: 1/7/20 1400

GAB dry date/time: —

	Yes	No	NA
1) **FOR SREV:** QA/QC approval for initial training or 2 sets of initials for WG & LIMS?	✓		
2) **FOR SREV:** For 903.1 WG's only, was the ICP Barium recovery raw data merged with the WG in LIMS?			✓
3) Does the workgroup include all required QC samples?	✓		
4) Are all QC criteria listed in LIMS within specified limits?	✓		
5) Does all QC have the correct nomenclature (PBS vs PBW, etc.)?	✓		
6) For GABs: Beta LCS/MS deleted from Alpha & Alpha LCS/MS deleted from Beta?			✓
7) Are all PCNs / SCNs used for LIMS calculations entered correctly?	✓		
8) Have all transcriptions been reviewed for accuracy (e.g. volumes, BG's, sx counts, etc.)?	✓		
9) Are samples flagged for INSX, if applicable?			✓
10) Is any sample analyzed using less volume appropriately "D" qualified?			✓
11) Are all calculations based on the correct matrix?	✓		
12) Are all errors properly corrected (i.e. single-line crossout, dated & initialed)?	✓		
13 Is a current standard/reagent sheet attached to the workgroup?	✓		
14) Are all associated WG benchsheets locked for editing?	✓		
15) For GAB WG's containing DW samples, did at least 72 hours elapse between end of drying and start of counting?			✓
16) Are all tracer or carrier recoveries within acceptable limits?	✓		
17) For Lead-210 WG's, are the counts off the instrument in gross counts?			✓
18) Is the correct instrument ID on the WG benchsheet, and does it correspond with the template and raw data?	✓		

QC limits *

Analyte	PBW	LCS & MS
gross alpha	2*LLD	67-144
gross beta	2*LLD	82-122
Ra-226 (903.1)	2*LLD	43-148
Alpha emitting Ra isotopes	2*LLD	66-132
Ra-228	2*LLD	47-123
Pb-210	2*LLD	55-121
Th	2*LLD	91-126
U-234	2*LLD	77-122
U-235	2*LLD	42-136
U-238	2*LLD	87-124
Po-210	2*LLD	51-128
GAMMA	2*LLD	90-110
Rn-222	2*LLD	90-110

Tracer/Carrier QC Limits

Tracer/Carrier	%Rec
Ra-228 (Ba & Y)	40-130
Alpha emitting Ra isotopes (Ba)	40-130
Ra-226 903.1 (Ba)	40-130
U-232	30-130
Po-209	25-130
Pb-210	30-130
Th-229	30-130

For any of the items listed above that are checked "No" state the corrective action/explanation below.

QC/Sample ID	Analytical Problem	Corrective action

Comments:

LCS MS limits developed from combined control chart data for LCSW LCSS.

ACZ Laboratories, Inc. **WG488867**
Radium 228 in Water
EPA 904.0/9320

[redacted]dsx12/26/2019 5:27 PM

Project: _____

SOP # 1495

Instrument: G542
Matrix Class: LIQUID
List Type: QC-RA-228
List Function: ANALYTICAL

Analyst: AMK
Dept: 55
Prep Date: 12/26/2019
Analysis Date:
Start Time:
End Time:
Approved:
Approved:

Seq #	ACZ Sample No. AMK 12/26/19	Client Sample ID	Sample Volume mL	Sample Matrix	Y Planchett Weight g	Y Gross Weight g	Sample Weight g	Residue Density mg/cm²	Ba Planchett Weight g	Ba Gross Weight g	Radium 228 pCi/L	Error (+-)	LLD pCi/L
1	WG488184PB5 W		300	SO									#DIV/0!
2	WG488184LCS2 W	PCN57186	250	SO									#DIV/0!
3	L56331-01	STSB32_0.5-3	300	SO									#DIV/0!
4	L56331-01DUP			SO									#DIV/0!
5	L56331-02	STSB32_6-15		SO									#DIV/0!
6	L56331-02MS	PCN57186		SO									#DIV/0!
7	L56331-03	STSB34_0.5-3		SO									#DIV/0!
8	L56331-04	STSB34_6-15		SO									#DIV/0!
9	L56331-05	STSB33_0.5-3		SO									#DIV/0!
10	L56331-06	STSB33_6-15		SO									#DIV/0!
11	L56331-07	STSB33-FD_0.5-3		SO									#DIV/0!
12	L56331-08	STSB35_0.5-3		SO									#DIV/0!
13	L56331-09	STSB35_6-15		SO									#DIV/0!
													#DIV/0!
													#DIV/0!
													#DIV/0!
													#DIV/0!
													#DIV/0!
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													#DIV/0!
													#DIV/0!
													#DIV/0!

Comments: ingrow 12/27/19 @ 1401
decay 1/7/20 @ 1251

LCSW ran using 250mL to accommodate other procedures

Decay Equation for Ra228:	
Standard Preparation Date	8/20/2018
Initial True Value (pCi/mL)	#DIV/0!
Decayed Value (pCi/mL)	measuredate?

Sr89 Calibration performed with PCN 54078

Daily performance check with SR-Y PCN 22287

ACZ LABORATORIES, INC.
Standards/Reagents Information

ANALYST: _____
WG488867.xlsx12/26/2019 5:27 PM
Second analyst: _____

Water

DATE TIME of prep start: _____

PROJECT/WG: _____
Method Ra-228 904/9320

INSTR: G542

Radioactive Standards

LCS & MS 57186

Reagents

Ammonium Sulfate:	RC191218-2	Ytrium carrer	RC191211-2	Ammonium Hydroxide.	59977
Barium Carrier:	RC191102-2	Strontium carrer	RC191211-1	Ammonium oxalate.	RC191126-3
Lead Carrier:	RC191206-1	Sr-Y mix	RC191102-1	Ammonium sulfide.	RC191209-1
Citric Acid	RC191025-1	Sulfuric Acid:	60173	EDTA	RC191226-1/RC191231-1/RC200107-3
Nitric Acid	60461	Acetic Acid:	60548	Methyl Orange	60079
Nitric Acid 6N	59928	Nitric Acid 1.0N	60461	Sodium hydroxide 18 N	RC191230-1
		Sodium hydroxide 10 N	RC191227-1		

COMMENTS:

ACZ Sample Number	Bottle ID
WG488184PBS	
WG488184LCSS	
L56331-01	
L56331-01DUP	
L56331-02	
L56331-02MS	
L56331-03	
L56331-04	
L56331-05	
L56331-06	
L56331-07	
L56331-08	
L56331-09	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	

Meteoric Water Mobility

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

WG488184

ACZ Laboratories, Inc

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 17:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
1	WG488184CSTD1	NONE															
2	WG488184CSTD2	NONE															
3	WG488184CSTD3	NONE															
4	WG488184ICV	PCN58503															
5	WG488184PBS	NONE	AS REC		12/18/19 17:59		4.89		6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
6	L56331-01	STSB32_0.5-3	AS REC		12/17/19 7:00	0	4.89	23	4.16	4.2	5000	5017	11.3	12/17/19 8:45	12/18/19 13:30	28.7499999999418	19.3
7	L56331-02	STSB32_6-15	AS REC		12/17/19 8:35	0	4.89	23	5.33	5.48	5000	5000.7	20.37	12/17/19 8:45	12/18/19 14:00	29.25	19.9
8	L56331-03	STSB34_0.5-3	AS REC		12/17/19 10:10	0	4.89	23	4.94	4.9	5000	5003	10.64	12/17/19 8:45	12/18/19 13:34	28.8666666666511	19.9
9	L56331-04	STSB34_6-15	AS REC		12/17/19 11:46	0	4.89	23	5.26	5.38	5000	5003.4	19.98	12/17/19 8:45	12/18/19 13:35	28.8333333331975	19.8
10	L56331-05	STSB33_0.5-3	AS REC		12/17/19 13:21	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
11	L56331-05MS1	MS191119-5	AS REC		12/17/19 14:57	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
12	L56331-05MSD1	MS191119-5	AS REC		12/17/19 18:08	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
13	L56331-05MS2	II191204-3	AS REC		12/17/19 16:32	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
14	L56331-05MSD2	II191204-3	AS REC		12/17/19 19:43	0	4.89	23	4.3	4.19	5000	5022	16.27	12/17/19 8:45	12/18/19 15:20	30.5833333333139	19.8
15	WG488184CCV1	PCN58503	AS REC		12/18/19 3:40		4.06		4.07	4.08							19.8
16	L56331-06	STSB33_6-15	AS REC		12/17/19 21:19	0	4.89	23	7.07	7.34	5000	5009.7	21.6	12/17/19 8:45	12/18/19 16:00	31.2499999998636	19.2
17	L56331-07	STSB33-FD_0.5-3	AS REC		12/17/19 22:54	0	4.89	23	4.28	4.34	5000	5000.3	16.22	12/17/19 8:45	12/18/19 14:25	29.6666666666279	19.2
18	L56331-08	STSB35_0.5-3	AS REC		12/18/19 0:29	0	4.89	23	4.25	4.21	5000	5000	11.69	12/17/19 8:45	12/18/19 14:15	29.4999999999418	19.2
19	L56331-09	STSB35_6-15	AS REC		12/18/19 2:05	0	4.89	23	3.87	3.8	5000	5004.4	11.16	12/17/19 8:45	12/18/19 14:15	29.4999999999418	19.4
20	WG488184ICV1		AS REC		12/18/19 13:13		3.97		3.97	3.97							20.1
20	WG488184LFB1	II191204-3	AS REC		12/18/19 14:49	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19
21	WG488184LFB2	MS191119-5	AS REC		12/18/19 16:24	0	4.89	23	6.18	6.21	0	5002.4		12/17/19 8:45	12/18/19 10:20	25.5833333332557	19

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/26/2019 5:26:20 PM 10120

Meteoric Water Mobility

WG488184

ACZ Laboratories, Inc

QC List Type: I-X-MWME
QCListMatClass: SOLID
Bench Sheet List: I-RFA-CN-FREE
QC Ref: CSTD3X-PBS-LFB-MSX2
Group ID: SP-G-MWMT
Method Ref: ASTM E2242-13
SOP Ref: SOPSO036

Instrument ID: SOILSPREP
Analyst: GKH
ACZ Dept: 20
Create Date: 12/16/2019 10:05
Start Date/Time: 12/17/2019 7:00
End Date/Time: 12/18/2019 17:59

SEQ	ACZ ID	Client ID	SubSX	Pri	Analysis Date	Particle Size over 5 cm (%)	Extraction pH (units)	Extraction Temperature (C)	Pre Filter pH (units)	Post Filter pH (units)	Dry Weight (g)	Leachate Volume (mL)	Retained Moisture (%)	Time In	Time Out	Extraction Time (hrs)	Temperature (C)
22	WG488184CCV2	PCN58503	AS REC		12/18/19 5:16		4.03		4.07	4.02							19.7

Sample	Login Comments
L56331-01	BUCKET || hand delivered to soils
L56331-02	BUCKET || hand delivered to soils
L56331-03	BUCKET || hand delivered to soils
L56331-04	BUCKET || hand delivered to soils
L56331-05	BUCKET || hand delivered to soils
L56331-05MS1	ICPMS Spike
L56331-05MS2	ICP Spike
L56331-05MSD1	ICPMS Spike
L56331-05MSD2	ICP Spike
L56331-06	BUCKET || hand delivered to soils
L56331-07	BUCKET || hand delivered to soils
L56331-08	BUCKET || hand delivered to soils
L56331-09	BUCKET || hand delivered to soils
WG488184CCV1	pH QC
WG488184CCV2	pH QC
WG488184CSTD1	pH QC
WG488184CSTD2	pH QC
WG488184CSTD3	pH QC
WG488184ICV	pH QC
WG488184ICV1	WG488184ICV1
WG488184LFB1	ICP LFB
WG488184LFB2	ICPMS LFB

Report Comments: _____

Internal Comments _____

AREV: _____
Initials, Date

SREV: _____
Initials, Date

12/26/2019 5:26:20 PM 10120

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Workgroup Review and Approval

WG488867

Date Reported: 08-Jan-20
Run ID: R1766865
Date Analyzed: 07-Jan-20
ICAL Workgroup:
Instrument ID: G542

L56331-01

Tag: **Measured:** 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	20-MWMT	2.2	1		pCi/L	++	6.1	2.5		TB	

L56331-01DUP

Tag: **Measured:** 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	FOUND	2.1 ✓	1		pCi/L	++	5.7	2.4			
FAIL	RADIUM 228	RER	0.03	1		%	++	1.5	3	RER = 0.017 ✓		
SREV	RADIUM 228	RPD	5	1		pCi/L	++	5.7	2.4			

L56331-02

Tag: **Measured:** 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	20-MWMT	4.9	1		pCi/L	++	5.8	2.4		TB	

L56331-02MS

Tag: **Measured:** 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	FOUND	32	1		pCi/L	++	5.6	3.6	PCN57186		
SREV	RADIUM 228	REC	96	1		%	++	5.6	3.6	PCN57186		
SREV	RADIUM 228	TRUE	0666666667 ✓	1		pCi/L	++	5.6	3.6	PCN57186		

L56331-03

Tag: **Measured:** 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	20-MWMT	3.1	1		pCi/L	++	6.6	2.8		TB	

L56331-04

Tag: **Measured:** 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	20-MWMT	4.8	1		pCi/L	++	5.7	2.8		TB	

L56331-05

Tag: **Measured:** 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	20-MWMT	0.64	1		pCi/L	++	5.1	2.1		TB	

L56331-06

Tag: **Measured:** 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	20-MWMT	-0.07	1		pCi/L	++	6.4	2.4		TB	

L56331-07

Tag: **Measured:** 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	20-MWMT	3	1		pCi/L	++	5.9	2.4		TB	

L56331-08

Tag: Measured: 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	20-MWMT	1.8	1		pCi/L	++	5.8	2.5		TB	

L56331-09

Tag: Measured: 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	20-MWMT	-0.5	1		pCi/L	++	5.9	2.1		TB	

WG488184LCSW

Tag: Measured: 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	FOUND	32	1		pCi/L	++	6.4	3.9	PCN57186		
SREV	RADIUM 228	REC	95	1		%	++	6.4	3.9	PCN57186		
SREV	RADIUM 228	TRUE	33.85208	1		pCi/L	++	6.4	3.9	PCN57186		

WG488184PBW

Tag: Measured: 1/7/2020 2:54:00 PM

Status	Parm_Stored	Type	Value	Dil	Qual	Units	Appv	MDL	PQL	Text Value	Ext Qual	Signal
SREV	RADIUM 228	FOUND	2.1 U	1		pCi/L	++	5.1	2			

ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa
USER ID: radchem

Source Name:
System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch	Elapsed Count Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
1	A	Daily BG		90Min. 0 Sec.	9	0.10	177	1.967
Status: Bkg		Acq Date: 2020/01/07 08:54:21.00						
Alpha Background QC CPM: 0.00 to 0.10 At 1.960 Std. **Yes** Beta Background QC CPM: 1.91 to 2.42 At 1.960 Std. **Yes**								
1	B	Daily BG		90Min. 0 Sec.	6	0.0667	198	2.2
Status: Bkg		Acq Date: 2020/01/07 08:54:21.00						
Alpha Background QC CPM: 0.00 to 0.08 At 1.960 Std. **Yes** Beta Background QC CPM: 1.91 to 2.40 At 1.960 Std. **Yes**								
1	D	Daily BG		90Min. 0 Sec.	9	0.10	162	1.8
Status: Bkg		Acq Date: 2020/01/07 08:54:21.00						
Alpha Background QC CPM: 0.02 to 0.11 At 1.960 Std. **Yes** Beta Background QC CPM: 1.72 to 2.57 At 1.960 Std. **Yes**								
1	C	Daily BG		90Min. 0 Sec.	10	0.1111	154	1.711
Status: Bkg		Acq Date: 2020/01/07 08:54:21.00						
Alpha Background QC CPM: 0.02 to 0.08 At 1.960 Std. **No** Beta Background QC CPM: 1.50 to 2.36 At 1.960 Std. **Yes**								
2	A	Daily BG		90Min. 0 Sec.	7	0.0778	158	1.756
Status: Bkg		Acq Date: 2020/01/07 08:54:26.00						
Alpha Background QC CPM: -0.01 to 0.15 At 1.960 Std. **Yes** Beta Background QC CPM: 1.72 to 3.40 At 1.960 Std. **Yes**								
2	D	Daily BG		90Min. 0 Sec.	11	0.1222	196	2.178
Status: Bkg		Acq Date: 2020/01/07 08:54:26.00						
Alpha Background QC CPM: 0.02 to 0.06 At 1.960 Std. **No** Beta Background QC CPM: 1.77 to 2.66 At 1.960 Std. **Yes**								
2	B	Daily BG		90Min. 0 Sec.	4	0.0444	205	2.278
Status: Bkg		Acq Date: 2020/01/07 08:54:26.00						
Alpha Background QC CPM: -0.05 to 0.12 At 1.960 Std. **Yes** Beta Background QC CPM: 1.72 to 3.40 At 1.960 Std. **Yes**								
2	C	Daily BG		90Min. 0 Sec.	7	0.0778	189	2.1
Status: Bkg		Acq Date: 2020/01/07 08:54:26.00						
Alpha Background QC CPM: 0.03 to 0.12 At 1.960 Std. **Yes** Beta Background QC CPM: 1.85 to 2.86 At 1.960 Std. **Yes**								
3	A	Daily BG		90Min. 0 Sec.	8	0.0889	161	1.789
Status: Bkg		Acq Date: 2020/01/07 08:54:31.00						
Alpha Background QC CPM: 0.01 to 0.09 At 1.960 Std. **Yes** Beta Background QC CPM: 1.70 to 2.64 At 1.960 Std. **Yes**								
3	C	Daily BG		90Min. 0 Sec.	6	0.0667	197	2.189
Status: Bkg		Acq Date: 2020/01/07 08:54:31.00						
Alpha Background QC CPM: 0.01 to 0.07 At 1.960 Std. **Yes** Beta Background QC CPM: 1.90 to 2.95 At 1.960 Std. **Yes**								
3	D	Daily BG		90Min. 0 Sec.	12	0.1333	236	2.622
Status: Bkg		Acq Date: 2020/01/07 08:54:31.00						
Alpha Background QC CPM: 0.00 to 0.08 At 1.960 Std. **No** Beta Background QC CPM: 2.34 to 3.51 At 1.960 Std. **Yes**								
3	B	Daily BG		90Min. 0 Sec.	8	0.0889	205	2.278
Status: Bkg		Acq Date: 2020/01/07 08:54:31.00						
Alpha Background QC CPM: 0.01 to 0.09 At 1.960 Std. **Yes** Beta Background QC CPM: 1.81 to 2.98 At 1.960 Std. **Yes**								
4	A	Daily BG		90Min. 0 Sec.	7	0.0778	186	2.067
Status: Bkg		Acq Date: 2020/01/07 08:54:35.00						
Alpha Background QC CPM: 0.04 to 0.17 At 1.960 Std. **Yes** Beta Background QC CPM: 1.82 to 2.44 At 1.960 Std. **Yes**								
4	C	Daily BG		90Min. 0 Sec.	6	0.0667	237	2.633
Status: Bkg		Acq Date: 2020/01/07 08:54:35.00						
Alpha Background QC CPM: 0.01 to 0.09 At 1.960 Std. **Yes** Beta Background QC CPM: 1.98 to 2.55 At 1.960 Std. **No**								
4	B	Daily BG		90Min. 0 Sec.	6	0.0667	171	1.9
Status: Bkg		Acq Date: 2020/01/07 08:54:35.00						
Alpha Background QC CPM: 0.00 to 0.08 At 1.960 Std. **Yes** Beta Background QC CPM: 1.76 to 2.51 At 1.960 Std. **Yes**								

Health Physics Specialist: _____ **Date:** _____

ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa
USER ID: radchem

Source Name:
System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch	Elapsed Count Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
4 D		Daily BG		90Min. 0 Sec.	8	0.0889	137	1.522
Status: Bkg		Acq Date: 2020/01/07 08:54:35.00						

Alpha Background QC CPM: -0.01 to 0.12 At 1.960 Std. **Yes** Beta Background QC CPM: 1.81 to 2.74 At 1.960 Std. [**No**

4C and 4D were not used to analyze samples.

Health Physics Specialist: _____ **Date:** _____

All meet criteria

ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name: 90SR3103846
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
1 A	Beta	Beta Perf		0Min.30 Sec.	5	10.0	1366	2732.0
Status: Source		Acq Date: 2020/01/07 14:00:28.00						
Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std No Beta Source QC CPM: 2,500.22 to 2,810.98 At 1.9 Yes								
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta								
1 B	Beta	Beta Perf		0Min.30 Sec.	0	0.0	2	4.0
Status: Unknown		Acq Date: 2020/01/07 14:00:28.00						
1 C	Beta	Beta Perf		0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:00:28.00						
1 D	Beta	Beta Perf		0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:00:28.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
1 A	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	4	8.0
Status: Unknown		Acq Date: 2020/01/07 14:01:19.00						
1 B	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1277	2554.0
Status: Source		Acq Date: 2020/01/07 14:01:19.00						

Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std Yes Beta Source QC CPM: 2,536.99 to 2,719.41 At 1.9 Yes
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta

1 C	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	3	6.0
Status: Unknown		Acq Date: 2020/01/07 14:01:19.00						
1 D	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:01:19.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
1 A	Beta	Beta Perf		0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/03 12:11:14.00						
1 B	Beta	Beta Perf		0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/03 12:11:14.00						
1 C	Beta	Beta Perf		0Min.30 Sec.	0	0.0	1029	2058.0
Status: Source		Acq Date: 2020/01/03 12:11:14.00						

Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std Yes Beta Source QC CPM: 2,021.69 to 2,662.71 At 1.9 Yes
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta

1 D	Beta	Beta Perf		0Min.30 Sec.	0	0.0	2	4.0
Status: Unknown		Acq Date: 2020/01/03 12:11:14.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
1 A	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/08 14:04:37.00						
1 B	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	3	6.0
Status: Unknown		Acq Date: 2020/01/08 14:04:37.00						
1 C	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1146	2292.0
Status: Source		Acq Date: 2020/01/08 14:04:37.00						

Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std Yes Beta Source QC CPM: 2,021.69 to 2,662.71 At 1.9 Yes
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta

1 D	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/08 14:04:37.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name: 90SR3103846
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
2 A	Beta	Beta Perf		0Min.30 Sec.	2	4.0	1298	2596.0
Status: Source		Acq Date: 2020/01/07 14:05:08.00						
Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std No Beta Source QC CPM: 2,492.64 to 2,830.56 At 1.9 Yes								
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta								
2 B	Beta	Beta Perf		0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:05:08.00						
2 C	Beta	Beta Perf		0Min.30 Sec.	0	0.0	4	8.0
Status: Unknown		Acq Date: 2020/01/07 14:05:08.00						
2 D	Beta	Beta Perf		0Min.30 Sec.	0	0.0	3	6.0
Status: Unknown		Acq Date: 2020/01/07 14:05:08.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
2 A	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	3	6.0
Status: Unknown		Acq Date: 2020/01/07 14:05:58.00						
2 B	Beta	Beta Perf	1	0Min.30 Sec.	1	2.0	1232	2464.0
Status: Source		Acq Date: 2020/01/07 14:05:58.00						

Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std No Beta Source QC CPM: 2,460.97 to 2,747.03 At 1.9 Yes
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta

2 C	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	2	4.0
Status: Unknown		Acq Date: 2020/01/07 14:05:58.00						
2 D	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:05:58.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
2 A	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:06:50.00						
2 B	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:06:50.00						
2 C	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1317	2634.0
Status: Source		Acq Date: 2020/01/07 14:06:50.00						

Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std Yes Beta Source QC CPM: 2,491.79 to 2,804.61 At 1.9 Yes
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta

2 D	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:06:50.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
2 A	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	2	4.0
Status: Unknown		Acq Date: 2020/01/07 14:07:40.00						
2 B	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:07:40.00						
2 C	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:07:40.00						
2 D	Beta	Beta Perf	3	0Min.30 Sec.	3	6.0	1293	2586.0
Status: Source		Acq Date: 2020/01/07 14:07:40.00						

Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std No Beta Source QC CPM: 2,455.43 to 2,748.57 At 1.9 Yes
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name: 90SR3103846
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
3 A	Beta	Beta Perf		0Min.30 Sec.	1	2.0	1289	2578.0
Status: Source		Acq Date: 2020/01/07 14:08:35.00						
Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std No Beta Source QC CPM: 2,482.40 to 2,722.80 At 1.9 Yes								
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta								
3 B	Beta	Beta Perf		0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:08:35.00						
3 C	Beta	Beta Perf		0Min.30 Sec.	0	0.0	2	4.0
Status: Unknown		Acq Date: 2020/01/07 14:08:35.00						
3 D	Beta	Beta Perf		0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:08:35.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
3 A	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	2	4.0
Status: Unknown		Acq Date: 2020/01/07 14:09:24.00						
3 B	Beta	Beta Perf	2	0Min.30 Sec.	2	4.0	1310	2620.0
Status: Source		Acq Date: 2020/01/07 14:09:24.00						

Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std No Beta Source QC CPM: 2,454.74 to 2,782.06 At 1.9 Yes
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta

3 C	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:09:24.00						
3 D	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:09:24.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
3 A	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:10:16.00						
3 B	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	3	6.0
Status: Unknown		Acq Date: 2020/01/07 14:10:16.00						
3 C	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1280	2560.0
Status: Source		Acq Date: 2020/01/07 14:10:16.00						

Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std Yes Beta Source QC CPM: 2,476.48 to 2,730.32 At 1.9 Yes
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta

3 D	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:10:16.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch	Elapsed Time	Alpha Count	Alpha Counts	Net cpm	Beta Counts	Beta Net cpm
3 A	Beta	Beta Perf		0Min.30 Sec.	0	0.0		0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:11:05.00							
3 B	Beta	Beta Perf		0Min.30 Sec.	0	0.0		1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:11:05.00							
3 C	Beta	Beta Perf		0Min.30 Sec.	0	0.0		1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:11:05.00							
3 D	Beta	Beta Perf		0Min.30 Sec.	1	2.0		1275	2550.0
Status: Source		Acq Date: 2020/01/07 14:11:05.00							

Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std No Beta Source QC CPM: 2,522.78 to 2,817.62 At 1.9 Yes
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name: 90SR3103846
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
4 A	Beta	Beta Perf		0Min.30 Sec.	0	0.0	1292	2584.0
Status: Source		Acq Date: 2020/01/07 14:11:59.00						
Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std Yes Beta Source QC CPM: 2,559.64 to 2,776.76 At 1.9 Yes								
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta								
4 B	Beta	Beta Perf		0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:11:59.00						
4 C	Beta	Beta Perf		0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:11:59.00						
4 D	Beta	Beta Perf		0Min.30 Sec.	0	0.0	4	8.0
Status: Unknown		Acq Date: 2020/01/07 14:11:59.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch Count	Elapsed Time	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
4 A	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:12:49.00						
4 B	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1250	2500.0
Status: Source		Acq Date: 2020/01/07 14:12:49.00						
Alpha Source QC CPM: 0.00 to 0.00 At 1.960 Std Yes Beta Source QC CPM: 2,421.64 to 2,584.36 At 1.9 Yes								
Source Name : 90SR3103846 Isotope Name: Sr-90 Half Life: 28.79 Years Emission Type: Beta								
4 C	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	1	2.0
Status: Unknown		Acq Date: 2020/01/07 14:12:49.00						
4 D	Beta	Beta Perf	0	0Min.30 Sec.	0	0.0	0	0.0
Status: Unknown		Acq Date: 2020/01/07 14:12:49.00						

Health Physics Specialist: _____ Date: _____

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ACZ LABS
G-542W QC and Analysis Report

Machine Name: Medusa Source Name:
USER ID: radchem System Serial #: 061701

Sample Position/De	Sample Ident	Sample Type	Batch	Elapsed Time	Alpha Count	Alpha Counts	Alpha Net cpm	Beta Counts	Beta Net cpm
1 A	31-7	Ra228_4a		90Min. 0 Sec.	15	0.1667	225	2.5	
Status: Unknown		Acq Date: 2020/01/07 14:53:47.00							
1 B	31-8	Ra228_4a		90Min. 0 Sec.	18	0.20	227	2.522	
Status: Unknown		Acq Date: 2020/01/07 14:53:47.00							
1 D		Ra228_4a		90Min. 0 Sec.	6	0.0319	208	2.311	
Status: Unknown		Acq Date: 2020/01/07 14:53:47.00							
1 C	31-9	Ra228_4a		90Min. 0 Sec.	12	0.1333	146	1.622	
Status: Unknown		Acq Date: 2020/01/07 14:53:47.00							
2 A	pbw	Ra228_4a		90Min. 0 Sec.	14	0.0889	197	2.189	
Status: Unknown		Acq Date: 2020/01/07 14:53:52.00							
2 D	31-1dup	Ra228_4a		90Min. 0 Sec.	12	0.1333	232	2.578	
Status: Unknown		Acq Date: 2020/01/07 14:53:52.00							
2 B	lcsw	Ra228_4a		90Min. 0 Sec.	20	0.1306	673	7.478	
Status: Unknown		Acq Date: 2020/01/07 14:53:52.00							
2 C	31-1	Ra228_4a		90Min. 0 Sec.	16	0.1111	223	2.478	
Status: Unknown		Acq Date: 2020/01/07 14:53:52.00							
3 A	31-2	Ra228_4a		90Min. 0 Sec.	6	0.0167	242	2.689	
Status: Unknown		Acq Date: 2020/01/07 14:53:56.00							
3 C	31-3	Ra228_4a		90Min. 0 Sec.	8	0.0722	242	2.689	
Status: Unknown		Acq Date: 2020/01/07 14:53:56.00							
3 D	31-4	Ra228_4a		90Min. 0 Sec.	19	0.1764	316	3.511	
Status: Unknown		Acq Date: 2020/01/07 14:53:56.00							
3 B	31-2ms	Ra228_4a		90Min. 0 Sec.	12	0.0917	741	8.233	
Status: Unknown		Acq Date: 2020/01/07 14:53:56.00							
4 A	31-5	Ra228_4a		90Min. 0 Sec.	6	0.0	198	2.2	
Status: Unknown		Acq Date: 2020/01/07 14:54:01.00							
4 C		Ra228_4a		90Min. 0 Sec.	14	0.0972	278	3.089	
Status: Unknown		Acq Date: 2020/01/07 14:54:01.00							
4 B	31-6	Ra228_4a		90Min. 0 Sec.	11	0.0639	170	1.889	
Status: Unknown		Acq Date: 2020/01/07 14:54:01.00							
4 D		Ra228_4a		90Min. 0 Sec.	10	0.0861	219	2.433	
Status: Unknown		Acq Date: 2020/01/07 14:54:01.00							

Health Physics Specialist: _____ Date: _____

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Wood - E&I Solutions, Inc.

Project ID: L56331

Radiochemistry

WG488867 **Ra228**

Sample	Date	SCN	RADIUM 228
L56331-01	01/07/20 14:54		X
L56331-06	01/07/20 14:54		X
L56331-07	01/07/20 14:54		X
WG488184PBW	01/07/20 14:54		X
WG488184LCSW	01/07/20 14:54		X
L56331-02MS	01/07/20 14:54		X
L56331-01DUP	01/07/20 14:54		X
L56331-03	01/07/20 14:54		X
L56331-09	01/07/20 14:54		X
L56331-05	01/07/20 14:54		X
L56331-04	01/07/20 14:54		X
L56331-02	01/07/20 14:54		X
L56331-08	01/07/20 14:54		X