

Chemical Analysis Report

SE-DIST-2023-01-26-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Port St. Lucie Run**
Request ID: **RQ-2023-01-23-14**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 09-FEB-2023 18:01



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical group are included in this report: Metals.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: North Fork St. Lucie River- North of Port St. Lucie Blvd

Collection Date/Time: 01/25/2023 12:45

Field ID: G2SE0070

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2383393	EPA 200.7 Rev. 4.4	Calcium	177		mg/L	P425079	
		Chromium	5.1	I	ug/L	P425079	
		Iron	150	I	ug/L	P425079	
		Magnesium	322		mg/L	P425079	
		Potassium	98		mg/L	P425079	
		Sodium	2.71E+03		mg/L	P425079	
		Strontium	4.20E+03		ug/L	P425079	
		Tin	9.0	U	ug/L	P425079	
		Titanium	2.2	U	ug/L	P425079	
		Vanadium	6.0	U	ug/L	P425079	
	EPA 200.8 Rev. 5.4	Zinc	15	U	ug/L	P425079	
		Aluminum	86		ug/L	P425079	
		Antimony	0.20	U	ug/L	P425079	
		Arsenic	1.57		ug/L	P425079	
		Barium	34.8		ug/L	P425079	
		Beryllium	0.040	U	ug/L	P425079	
		Boron	1.04E+03		ug/L	P425079	
		Cadmium	0.080	U	ug/L	P425079	
		Cobalt	0.17	I	ug/L	P425079	
		Copper	1.9	I	ug/L	P425079	
		Lead	0.80	U	ug/L	P425079	
		Manganese	17.1		ug/L	P425079	
		Molybdenum	4.2		ug/L	P425079	
		Nickel	2.0	U	ug/L	P425079	
		Selenium	0.80	U	ug/L	P425079	
		Silver	0.040	U	ug/L	P425079	
		Thallium	0.40	U	ug/L	P425079	

Ref. Method and Comment:

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium, potassium, sodium and strontium are unavailable because of high analyte concentration in the QC sample.

Sample Location: North Fork St. Lucie- Prima Vista Blvd

Collection Date/Time: 01/25/2023 11:50

Field ID: G2SE0071

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2383394	EPA 200.7 Rev. 4.4	Calcium	112		mg/L	P425131	
		Chromium	1.0	U	ug/L	P425131	
		Iron	540		ug/L	P425131	
		Magnesium	32.0		mg/L	P425131	
		Potassium	7.1		mg/L	P425131	
		Sodium	187		mg/L	P425131	
		Strontium	4.02E+03		ug/L	P425131	
		Tin	3.0	U	ug/L	P425131	
		Titanium	2.7	I	ug/L	P425131	
		Vanadium	2.0	U	ug/L	P425131	
		Zinc	7.8	I	ug/L	P425131	
	EPA 200.8 Rev. 5.4	Aluminum	199		ug/L	P425131	
		Antimony	0.077	I	ug/L	P425131	
		Arsenic	1.21		ug/L	P425131	
		Barium	43.6		ug/L	P425131	
		Beryllium	0.015	I	ug/L	P425131	
		Boron	98.8		ug/L	P425131	
		Cadmium	0.020	U	ug/L	P425131	
		Cobalt	0.105		ug/L	P425131	
		Copper	2.08		ug/L	P425131	
		Lead	0.29	I	ug/L	P425131	
		Manganese	24.3		ug/L	P425131	
		Molybdenum	2.20		ug/L	P425131	
		Nickel	0.51	I	ug/L	P425131	
		Selenium	0.20	U	ug/L	P425131	
		Silver	0.010	U	ug/L	P425131	
		Thallium	0.10	U	ug/L	P425131	

Ref. Method and Comment:

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425079

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425131

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425079

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425131

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425079

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Chromium	104		P	85 - 115
Iron	104		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	104		P	85 - 115
Sodium	103		P	85 - 115
Strontium	103		P	85 - 115
Tin	106		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	103		P	85 - 115
Zinc	108		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P425131

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Chromium	102		P	85 - 115
Iron	106		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	105		P	85 - 115
Sodium	100		P	85 - 115
Strontium	101		P	85 - 115
Tin	103		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425079

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	95.0		P	85 - 115
Arsenic	99.8		P	85 - 115
Barium	102		P	85 - 115
Beryllium	89.9		P	85 - 115
Boron	101		P	85 - 115
Cadmium	103		P	85 - 115
Cobalt	97.4		P	85 - 115
Copper	99.4		P	85 - 115
Lead	97.9		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	96.0		P	85 - 115
Nickel	100		P	85 - 115
Selenium	97.8		P	85 - 115
Silver	98.6		P	85 - 115
Thallium	98.4		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425131

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	96.1		P	85 - 115
Arsenic	99.5		P	85 - 115
Barium	99.8		P	85 - 115
Beryllium	97.2		P	85 - 115
Boron	103		P	85 - 115
Cadmium	97.9		P	85 - 115
Cobalt	97.9		P	85 - 115
Copper	98.0		P	85 - 115
Lead	95.1		P	85 - 115
Manganese	97.4		P	85 - 115
Molybdenum	94.3		P	85 - 115
Nickel	98.7		P	85 - 115
Selenium	96.0		P	85 - 115
Silver	97.6		P	85 - 115
Thallium	96.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P425079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383393	Chromium	96.9	95.0	P/P	70 - 130
2383393	Iron	100	101	P/P	70 - 130
2383393	Tin	91.0	87.7	P/P	70 - 130
2383393	Titanium	101	105	P/P	70 - 130
2383393	Vanadium	100	104	P/P	70 - 130
2383393	Zinc	99.8	100	P/P	70 - 130

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P425131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383195	Chromium	98.6	98.3	P/P	80 - 120
2383195	Iron	104	106	P/P	80 - 120
2383195	Magnesium	100		P	80 - 120
2383195	Potassium	99.4	102	P/P	80 - 120
2383195	Sodium	103		P	80 - 120
2383195	Strontium	98.7	100	P/P	80 - 120
2383195	Tin	100	99.8	P/P	80 - 120
2383195	Titanium	98.9	98.8	P/P	80 - 120
2383195	Vanadium	101	101	P/P	80 - 120
2383195	Zinc	103	103	P/P	80 - 120
2383379	Calcium	104		P	80 - 120
2383379	Chromium	99.6		P	80 - 120
2383379	Iron	103		P	80 - 120
2383379	Magnesium	104		P	80 - 120
2383379	Potassium	99.4		P	80 - 120
2383379	Sodium	103		P	80 - 120
2383379	Strontium	101		P	80 - 120
2383379	Tin	104		P	80 - 120
2383379	Titanium	97.5		P	80 - 120
2383379	Vanadium	102		P	80 - 120
2383379	Zinc	106		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P425079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383393	Aluminum	112	120	P/P	70 - 130
2383393	Antimony	101	106	P/P	70 - 130
2383393	Arsenic	112	118	P/P	70 - 130
2383393	Barium	107	114	P/P	70 - 130
2383393	Beryllium	105	112	P/P	70 - 130
2383393	Boron	106	123	P/P	70 - 130
2383393	Cadmium	102	107	P/P	70 - 130
2383393	Cobalt	111	116	P/P	70 - 130
2383393	Copper	109	116	P/P	70 - 130
2383393	Lead	101	108	P/P	70 - 130
2383393	Manganese	104	110	P/P	70 - 130
2383393	Molybdenum	108	117	P/P	70 - 130
2383393	Nickel	116	123	P/P	70 - 130
2383393	Selenium	105	113	P/P	70 - 130
2383393	Silver	93.7	99.0	P/P	70 - 130

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P425079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383393	Thallium	104	111	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P425131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2383195	Aluminum	97.3	98.6	P/P	80 - 120
2383195	Antimony	103	103	P/P	80 - 120
2383195	Arsenic	106	106	P/P	80 - 120
2383195	Barium	105	106	P/P	80 - 120
2383195	Beryllium	103	102	P/P	80 - 120
2383195	Boron	97.7	100	P/P	80 - 120
2383195	Cadmium	103	105	P/P	80 - 120
2383195	Cobalt	103	104	P/P	80 - 120
2383195	Copper	99.4	101	P/P	80 - 120
2383195	Lead	98.4	99.3	P/P	80 - 120
2383195	Manganese	101	103	P/P	80 - 120
2383195	Molybdenum	103	105	P/P	80 - 120
2383195	Nickel	103	104	P/P	80 - 120
2383195	Selenium	104	104	P/P	80 - 120
2383195	Silver	96.9	98.2	P/P	80 - 120
2383195	Thallium	101	103	P/P	80 - 120
2383379	Aluminum	99.8		P	80 - 120
2383379	Antimony	101		P	80 - 120
2383379	Arsenic	103		P	80 - 120
2383379	Barium	102		P	80 - 120
2383379	Beryllium	99.0		P	80 - 120
2383379	Boron	106		P	80 - 120
2383379	Cadmium	103		P	80 - 120
2383379	Cobalt	101		P	80 - 120
2383379	Copper	99.9		P	80 - 120
2383379	Lead	98.1		P	80 - 120
2383379	Manganese	100		P	80 - 120
2383379	Molybdenum	98.8		P	80 - 120
2383379	Nickel	102		P	80 - 120
2383379	Selenium	99.2		P	80 - 120
2383379	Silver	99.9		P	80 - 120
2383379	Thallium	101		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P425079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383393	Calcium	2.18	Spike	P	0 - 20
2383393	Chromium	1.89	Spike	P	0 - 20
2383393	Iron	0.677	Spike	P	0 - 20
2383393	Magnesium	5.12	Spike	P	0 - 20
2383393	Potassium	4.92	Spike	P	0 - 20
2383393	Sodium	3.69	Spike	P	0 - 20
2383393	Strontium	3.01	Spike	P	0 - 20
2383393	Tin	3.64	Spike	P	0 - 20
2383393	Titanium	3.44	Spike	P	0 - 20
2383393	Vanadium	3.69	Spike	P	0 - 20
2383393	Zinc	0.341	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P425131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383195	Calcium	0.0133	Spike	P	0 - 20
2383195	Chromium	0.299	Spike	P	0 - 20
2383195	Iron	1.18	Spike	P	0 - 20
2383195	Magnesium	1.01	Spike	P	0 - 20
2383195	Potassium	1.96	Spike	P	0 - 20
2383195	Sodium	0.257	Spike	P	0 - 20
2383195	Strontium	1.26	Spike	P	0 - 20
2383195	Tin	0.554	Spike	P	0 - 20
2383195	Titanium	0.134	Spike	P	0 - 20
2383195	Vanadium	0.455	Spike	P	0 - 20
2383195	Zinc	0.131	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P425079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383393	Aluminum	6.65	Spike	P	0 - 20
2383393	Antimony	5.56	Spike	P	0 - 20
2383393	Arsenic	5.69	Spike	P	0 - 20
2383393	Barium	4.75	Spike	P	0 - 20
2383393	Beryllium	5.95	Spike	P	0 - 20
2383393	Boron	2.67	Spike	P	0 - 20
2383393	Cadmium	4.79	Spike	P	0 - 20
2383393	Cobalt	4.63	Spike	P	0 - 20
2383393	Copper	5.92	Spike	P	0 - 20
2383393	Lead	6.42	Spike	P	0 - 20
2383393	Manganese	5.05	Spike	P	0 - 20
2383393	Molybdenum	6.83	Spike	P	0 - 20
2383393	Nickel	6.24	Spike	P	0 - 20
2383393	Selenium	7.35	Spike	P	0 - 20
2383393	Silver	5.50	Spike	P	0 - 20
2383393	Thallium	7.22	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2383195	Aluminum	1.32	Spike	P	0 - 20
2383195	Antimony	0.127	Spike	P	0 - 20
2383195	Arsenic	0.303	Spike	P	0 - 20
2383195	Barium	0.626	Spike	P	0 - 20
2383195	Beryllium	0.707	Spike	P	0 - 20
2383195	Boron	1.87	Spike	P	0 - 20
2383195	Cadmium	1.57	Spike	P	0 - 20
2383195	Cobalt	1.57	Spike	P	0 - 20
2383195	Copper	1.71	Spike	P	0 - 20
2383195	Lead	0.918	Spike	P	0 - 20
2383195	Manganese	1.08	Spike	P	0 - 20
2383195	Molybdenum	1.09	Spike	P	0 - 20
2383195	Nickel	1.53	Spike	P	0 - 20
2383195	Selenium	0.0987	Spike	P	0 - 20
2383195	Silver	1.33	Spike	P	0 - 20
2383195	Thallium	2.02	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A117195

Included Lab Sample IDs: 2383393, 2383394

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Calcium	99.9	101	P/P	90 - 110
Chromium	102	101	P/P	90 - 110
Chromium	102	102	P/P	90 - 110
Iron	103	101	P/P	90 - 110
Iron	99.3	102	P/P	90 - 110
Magnesium	102	93.2	P/P	90 - 110
Magnesium	103	101	P/P	90 - 110
Potassium	103	99.1	P/P	90 - 110
Potassium	103	98.9	P/P	90 - 110
Sodium	101	99.9	P/P	90 - 110
Sodium	103	101	P/P	90 - 110
Strontium	102	104	P/P	90 - 110
Strontium	103	102	P/P	90 - 110
Tin	102	99.8	P/P	90 - 110
Tin	103	103	P/P	90 - 110
Titanium	98.9	101	P/P	90 - 110
Titanium	99.1	99.0	P/P	90 - 110
Vanadium	99.8	99.9	P/P	90 - 110
Vanadium	99.8	100	P/P	90 - 110
Zinc	105	101	P/P	90 - 110
Zinc	107	107	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A117214

Included Lab Sample IDs: 2383394

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	101	P/P	90 - 110
Antimony	98.1	99.0	P/P	90 - 110
Arsenic	101	100	P/P	90 - 110
Barium	99.2	100	P/P	90 - 110
Beryllium	102	103	P/P	90 - 110
Boron	100	102	P/P	90 - 110
Cadmium	99.7	101	P/P	90 - 110
Cobalt	98.2	99.1	P/P	90 - 110
Copper	99.0	99.7	P/P	90 - 110
Lead	99.5	99.1	P/P	90 - 110
Manganese	99.2	102	P/P	90 - 110
Molybdenum	94.7	96.4	P/P	90 - 110
Nickel	98.7	99.4	P/P	90 - 110
Selenium	98.3	99.8	P/P	90 - 110
Silver	98.5	99.9	P/P	90 - 110
Thallium	100	99.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A117245

Included Lab Sample IDs: 2383393

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A117245

Included Lab Sample IDs: 2383393

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	95.9	96.6	P/P	90 - 110
Arsenic	101	102	P/P	90 - 110
Barium	102	104	P/P	90 - 110
Beryllium	98.2	101	P/P	90 - 110
Cadmium	101	100	P/P	90 - 110
Copper	101	102	P/P	90 - 110
Lead	99.3	98.8	P/P	90 - 110
Manganese	103	104	P/P	90 - 110
Molybdenum	95.6	96.0	P/P	90 - 110
Nickel	102	104	P/P	90 - 110
Selenium	101	103	P/P	90 - 110
Silver	99.6	99.3	P/P	90 - 110
Thallium	98.7	98.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A117292

Included Lab Sample IDs: 2383393

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	98.5	97.1	P/P	90 - 110
Cobalt	99.6	101	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			LCS	Precision SMP	MS
EPA 200.7 Rev. 4.4	Calcium	104						2.18
	Calcium	102		104				0.0133
	Chromium	104		96.9	95.0			1.89
	Chromium	102		98.6	98.3	99.6		0.299
	Iron	104		100	101			0.677
	Iron	106		104	106	103		1.18
	Magnesium	104						5.12
	Magnesium	104		100	104			1.01
	Potassium	104						4.92
	Potassium	105		99.4	102	99.4		1.96
	Sodium	103						3.69
	Sodium	100		103	103			0.257
	Strontium	103						3.01
	Strontium	101		98.7	100	101		1.26
	Tin	106		91.0	87.7			3.64
	Tin	103		104	100	99.8		0.554
	Titanium	102		101	105			3.44
	Titanium	101		98.9	98.8	97.5		0.134
	Vanadium	103		100	104			3.69
	Vanadium	101		101	101	102		0.455
	Zinc	108		99.8	100			0.341
	Zinc	106		103	103	106		0.131
EPA 200.8 Rev. 5.4	Aluminum	103		112	120			6.65
	Aluminum	101		97.3	98.6	99.8		1.32
	Antimony	95.0		101	106			5.56
	Antimony	96.1		103	103	101		0.127
	Arsenic	99.8		112	118			5.69
	Arsenic	99.5		106	106	103		0.303
	Barium	102		107	114			4.75
	Barium	99.8		105	106	102		0.626
	Beryllium	89.9		105	112			5.95
	Beryllium	97.2		103	102	99.0		0.707
	Boron	101		106	123			2.67
	Boron	103		97.7	100	106		1.87
	Cadmium	103		102	107			4.79
	Cadmium	97.9		103	105	103		1.57
	Cobalt	97.4		111	116			4.63
	Cobalt	97.9		103	104	101		1.57
	Copper	99.4		109	116			5.92
	Copper	98.0		99.4	101	99.9		1.71
	Lead	97.9		101	108			6.42
	Lead	95.1		98.4	99.3	98.1		0.918
	Manganese	101		104	110			5.05
	Manganese	97.4		101	103	100		1.08
	Molybdenum	96.0		108	117			6.83
	Molybdenum	94.3		103	105	98.8		1.09
	Nickel	100		116	123			6.24
	Nickel	98.7		103	104	102		1.53
	Selenium	97.8		105	113			7.35
	Selenium	96.0		104	104	99.2		0.0987
	Silver	98.6		93.7	99.0			5.50
	Silver	97.6		96.9	98.2	99.9		1.33
	Thallium	98.4		104	111			7.22
	Thallium	96.7		101	103	101		2.02

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2383393, 2383394
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2383393, 2383394

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	01/26/2023	01/27/2023 11:00	Vijayalakshmi Reddy	01/31/2023 20:22	McKinley C Carter	2383393
	01/26/2023	01/27/2023 11:00	Vijayalakshmi Reddy	01/31/2023 21:20	McKinley C Carter	2383393
	01/26/2023	01/30/2023 11:10	Vijayalakshmi Reddy	01/31/2023 16:49	McKinley C Carter	2383394
EPA 200.8 Rev. 5.4	01/26/2023	01/27/2023 11:00	Vijayalakshmi Reddy	02/02/2023 22:59	Emily M Philpot	2383393
	01/26/2023	01/27/2023 11:00	Vijayalakshmi Reddy	02/03/2023 18:03	Emily M Philpot	2383393
	01/26/2023	01/30/2023 11:10	Vijayalakshmi Reddy	02/02/2023 03:03	Emily M Philpot	2383394