Chemical Analysis Report

TLH-ROC-2022-03-01-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Run 18**
Request ID: **RQ-2022-02-21-77**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

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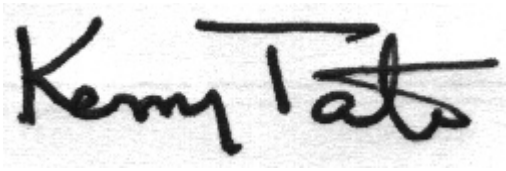
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 10-MAR-2022 13:01



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: Quincy Creek upstream Ralph Strang Rd **Collection Date/Time: 03/01/2022 09:50**

Field ID: G1TLHR0163 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2308895	EPA 200.7 Rev. 4.4	Calcium	18.8		mg/L	P410595	
		Iron	2.46E+03		ug/L	P410595	
		Magnesium	4.19		mg/L	P410595	
		Potassium	3.0		mg/L	P410595	
		Sodium	16.8		mg/L	P410595	
		Strontium	43.8		ug/L	P410595	
		Tin	3.0	U	ug/L	P410595	
		Titanium	1.1	I	ug/L	P410595	
		Vanadium	2.0	U	ug/L	P410595	
		Zinc	9.9	I	ug/L	P410595	
	EPA 200.8 Rev. 5.4	Aluminum	56		ug/L	P410595	
		Antimony	0.12	I	ug/L	P410595	
		Arsenic	0.80		ug/L	P410595	
		Barium	16.6		ug/L	P410595	
		Beryllium	0.010	U	ug/L	P410595	
		Boron**	66.4		ug/L	P410595	
		Cadmium	0.020	U	ug/L	P410595	
		Chromium	0.40	U	ug/L	P410595	
		Cobalt	0.288		ug/L	P410595	
		Copper	0.75	I	ug/L	P410595	
		Lead	0.20	U	ug/L	P410595	
		Manganese	144		ug/L	P410595	
		Molybdenum	0.55	I	ug/L	P410595	
		Nickel	0.50	U	ug/L	P410595	
		Selenium	0.20	U	ug/L	P410595	
		Silver	0.010	U	ug/L	P410595	
		Thallium	0.10	U	ug/L	P410595	
	SM 2340B	Hardness	64.1		mg/L	P410595	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese 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: P410595

Component	Result	Code	Units
Calcium	0.075	U	mg/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: P410595

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
Chromium	0.40	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: P410595

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	108		P	85 - 115
Iron	108		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	106		P	85 - 115
Sodium	105		P	85 - 115
Strontium	104		P	85 - 115
Tin	105		P	85 - 115
Titanium	104		P	85 - 115
Vanadium	97.8		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410595

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	99.6		P	85 - 115
Arsenic	98.5		P	85 - 115
Barium	102		P	85 - 115
Beryllium	97.0		P	85 - 115
Boron	102		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	95.7		P	85 - 115
Cobalt	97.5		P	85 - 115
Copper	96.5		P	85 - 115
Lead	95.2		P	85 - 115
Manganese	96.6		P	85 - 115
Molybdenum	98.3		P	85 - 115
Nickel	98.0		P	85 - 115
Selenium	98.5		P	85 - 115
Silver	98.8		P	85 - 115
Thallium	98.1		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2308895	Calcium	104		P	80 - 120
2308895	Iron	104	107	P/P	80 - 120
2308895	Magnesium	103		P	80 - 120
2308895	Potassium	102	104	P/P	80 - 120
2308895	Sodium	102		P	80 - 120
2308895	Strontium	104	105	P/P	80 - 120
2308895	Tin	108	105	P/P	80 - 120
2308895	Titanium	104	105	P/P	80 - 120
2308895	Vanadium	99.7	102	P/P	80 - 120
2308895	Zinc	105	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2307546	Aluminum	99.5		P	75 - 125
2307546	Antimony	104		P	75 - 125
2307546	Arsenic	102		P	75 - 125
2307546	Barium	103		P	75 - 125
2307546	Beryllium	92.6		P	75 - 125
2307546	Boron	110		P	75 - 125
2307546	Cadmium	101		P	75 - 125
2307546	Chromium	101		P	75 - 125
2307546	Cobalt	100		P	75 - 125
2307546	Copper	93.5		P	75 - 125
2307546	Lead	97.7		P	75 - 125
2307546	Manganese	101		P	75 - 125
2307546	Molybdenum	105		P	75 - 125
2307546	Nickel	98.9		P	75 - 125
2307546	Selenium	99.6		P	75 - 125
2307546	Silver	95.9		P	75 - 125
2307546	Thallium	103		P	75 - 125
2308895	Aluminum	102	101	P/P	80 - 120
2308895	Antimony	100	99.5	P/P	80 - 120
2308895	Arsenic	99.5	99.2	P/P	80 - 120
2308895	Barium	101	100	P/P	80 - 120
2308895	Beryllium	97.0	97.4	P/P	80 - 120
2308895	Boron	105	106	P/P	80 - 120
2308895	Cadmium	100	100	P/P	80 - 120
2308895	Chromium	97.8	97.9	P/P	80 - 120
2308895	Cobalt	99.2	98.9	P/P	80 - 120
2308895	Copper	96.8	96.8	P/P	80 - 120
2308895	Lead	96.8	96.6	P/P	80 - 120
2308895	Molybdenum	99.6	100	P/P	80 - 120
2308895	Nickel	99.5	100	P/P	80 - 120
2308895	Selenium	98.6	97.5	P/P	80 - 120
2308895	Silver	97.2	96.6	P/P	80 - 120
2308895	Thallium	101	101	P/P	80 - 120

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P410595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308895	Calcium	1.48	Spike	P	0 - 20
2308895	Iron	2.22	Spike	P	0 - 20
2308895	Magnesium	1.34	Spike	P	0 - 20
2308895	Potassium	1.24	Spike	P	0 - 20
2308895	Sodium	1.44	Spike	P	0 - 20
2308895	Strontium	0.454	Spike	P	0 - 20
2308895	Tin	2.00	Spike	P	0 - 20
2308895	Titanium	0.919	Spike	P	0 - 20
2308895	Vanadium	2.04	Spike	P	0 - 20
2308895	Zinc	1.96	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P410595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2308895	Aluminum	0.594	Spike	P	0 - 20
2308895	Antimony	0.926	Spike	P	0 - 20
2308895	Arsenic	0.306	Spike	P	0 - 20
2308895	Barium	0.588	Spike	P	0 - 20
2308895	Beryllium	0.354	Spike	P	0 - 20
2308895	Boron	0.185	Spike	P	0 - 20
2308895	Cadmium	0.136	Spike	P	0 - 20
2308895	Chromium	0.187	Spike	P	0 - 20
2308895	Cobalt	0.383	Spike	P	0 - 20
2308895	Copper	0.0692	Spike	P	0 - 20
2308895	Lead	0.203	Spike	P	0 - 20
2308895	Manganese	1.23	Spike	P	0 - 20
2308895	Molybdenum	0.326	Spike	P	0 - 20
2308895	Nickel	0.481	Spike	P	0 - 20
2308895	Selenium	1.09	Spike	P	0 - 20
2308895	Silver	0.574	Spike	P	0 - 20
2308895	Thallium	0.411	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110775
Included Lab Sample IDs: 2308895

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.7	99.9	P/P	90 - 110
Antimony	95.9	94.0	P/P	90 - 110
Arsenic	99.9	96.5	P/P	90 - 110
Barium	98.0	97.8	P/P	90 - 110
Beryllium	95.3	94.1	P/P	90 - 110
Boron	99.4	103	P/P	90 - 110
Cadmium	98.9	97.2	P/P	90 - 110
Chromium	96.3	94.5	P/P	90 - 110
Cobalt	98.3	96.5	P/P	90 - 110
Copper	99.1	95.9	P/P	90 - 110
Lead	94.6	92.5	P/P	90 - 110
Manganese	96.1	96.4	P/P	90 - 110
Molybdenum	99.6	96.7	P/P	90 - 110
Nickel	99.3	97.4	P/P	90 - 110
Selenium	98.3	96.8	P/P	90 - 110
Silver	96.1	94.5	P/P	90 - 110
Thallium	99.5	98.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A110800
Included Lab Sample IDs: 2308895

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	101	P/P	90 - 110
Iron	103	100	P/P	90 - 110
Magnesium	103	99.8	P/P	90 - 110
Potassium	101	98.2	P/P	90 - 110
Sodium	104	101	P/P	90 - 110
Strontium	98.2	95.7	P/P	90 - 110
Tin	98.2	95.8	P/P	90 - 110
Titanium	96.9	94.4	P/P	90 - 110
Vanadium	97.6	95.1	P/P	90 - 110
Zinc	99.7	97.6	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			Precision		
						LCS	SMP	MS
EPA 200.7 Rev. 4.4	Calcium	108	104					1.48
	Iron	108	104	107				2.22
	Magnesium	106	103					1.34
	Potassium	106	102	104				1.24
	Sodium	105	102					1.44
	Strontium	104	104	105				0.454
	Tin	105	108	105				2.00
	Titanium	104	104	105				0.919
	Vanadium	97.8	99.7	102				2.04
	Zinc	105	105	107				1.96
EPA 200.8 Rev. 5.4	Aluminum	100	102	101	99.5			0.594
	Antimony	99.6	100	99.5	104			0.926
	Arsenic	98.5	99.5	99.2	102			0.306
	Barium	102	101	100	103			0.588
	Beryllium	97.0	97.0	97.4	92.6			0.354
	Boron	102	105	106	110			0.185
	Cadmium	98.9	100	100	101			0.136
	Chromium	95.7	97.8	97.9	101			0.187
	Cobalt	97.5	99.2	98.9	100			0.383
	Copper	96.5	96.8	96.8	93.5			0.0692
	Lead	95.2	96.8	96.6	97.7			0.203
	Manganese	96.6	101					1.23
	Molybdenum	98.3	99.6	100	105			0.326
	Nickel	98.0	99.5	100	98.9			0.481
	Selenium	98.5	98.6	97.5	99.6			1.09
	Silver	98.8	97.2	96.6	95.9			0.574
	Thallium	98.1	101	101	103			0.411

Reference Method Descriptions

Method	Description	Associated Samples
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2308895
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2308895
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2308895

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	03/01/2022	03/03/2022 10:15	Megan Whitefoot	03/07/2022 16:29	Josef B Mick	2308895
EPA 200.8 Rev. 5.4	03/01/2022	03/03/2022 10:15	Megan Whitefoot	03/04/2022 14:45	Alexander Thompson	2308895
SM 2340B	03/01/2022			03/07/2022 16:29	Josef B Mick	2308895