

Chemical Analysis Report

TLH-ROC-2022-06-30-01

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

Event Description: **Run 16**
Request ID: **RQ-2022-06-06-68**
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: 12-JUL-2022 14:06

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Big Branch @ Rd5

Collection Date/Time: 06/30/2022 11:25

Field ID: G2TLHR0049

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2338497	EPA 200.7 Rev. 4.4	Calcium	1.17		mg/L	P416115	
		Iron	340		ug/L	P416115	
		Magnesium	0.43		mg/L	P416115	
		Potassium	0.31	I	mg/L	P416115	
		Sodium	1.8	I	mg/L	P416115	
		Strontium	8.7		ug/L	P416115	
		Tin	3.0	U	ug/L	P416115	
		Titanium	12.4		ug/L	P416115	
		Vanadium	2.0	U	ug/L	P416115	
		Zinc	5.0	U	ug/L	P416115	
	EPA 200.8 Rev. 5.4	Aluminum	485		ug/L	P416115	
		Antimony	0.050	U	ug/L	P416115	
		Arsenic	0.21		ug/L	P416115	
		Barium	11.5		ug/L	P416115	
		Beryllium	0.041		ug/L	P416115	
		Boron**	13.0		ug/L	P416115	
		Cadmium	0.020	U	ug/L	P416115	
		Chromium	0.40	U	ug/L	P416115	
		Cobalt	0.220		ug/L	P416115	
		Copper	0.40	U	ug/L	P416115	
		Lead	0.38	I	ug/L	P416115	
		Manganese	12.7		ug/L	P416115	
		Molybdenum	0.15	U	ug/L	P416115	
		Nickel	0.50	U	ug/L	P416115	
		Selenium	0.20	U	ug/L	P416115	
		Silver	0.010	U	ug/L	P416115	
		Thallium	0.10	U	ug/L	P416115	
	SM 2340 B-2011	Hardness	4.7		mg/L	P416115	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P416115

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: P416115

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: P416115

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	92.2		P	85 - 115
Magnesium	94.4		P	85 - 115
Potassium	105		P	85 - 115
Sodium	97.6		P	85 - 115
Strontium	103		P	85 - 115
Tin	106		P	85 - 115
Titanium	106		P	85 - 115
Vanadium	104		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P416115

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.6		P	85 - 115
Antimony	99.1		P	85 - 115
Arsenic	98.3		P	85 - 115
Barium	101		P	85 - 115
Beryllium	91.8		P	85 - 115
Boron	99.4		P	85 - 115
Cadmium	95.5		P	85 - 115
Chromium	93.8		P	85 - 115
Cobalt	94.8		P	85 - 115
Copper	94.4		P	85 - 115
Lead	94.8		P	85 - 115
Manganese	94.1		P	85 - 115
Molybdenum	97.9		P	85 - 115
Nickel	96.1		P	85 - 115
Selenium	94.1		P	85 - 115
Silver	97.2		P	85 - 115
Thallium	95.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P416115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338497	Calcium	101		P	80 - 120
2338497	Iron	99.8		P	80 - 120
2338497	Magnesium	101		P	80 - 120
2338497	Potassium	103		P	80 - 120
2338497	Sodium	104		P	80 - 120
2338497	Strontium	105		P	80 - 120
2338497	Tin	108		P	80 - 120
2338497	Titanium	96.3		P	80 - 120
2338497	Vanadium	107		P	80 - 120
2338497	Zinc	107		P	80 - 120
2338614	Calcium	100	101	P/P	80 - 120
2338614	Iron	102	102	P/P	80 - 120
2338614	Magnesium	102	101	P/P	80 - 120
2338614	Potassium	103	103	P/P	80 - 120
2338614	Sodium	98.7		P	80 - 120
2338614	Strontium	105	105	P/P	80 - 120
2338614	Tin	107	104	P/P	80 - 120
2338614	Titanium	107	107	P/P	80 - 120
2338614	Vanadium	106	106	P/P	80 - 120
2338614	Zinc	106	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P416115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338497	Aluminum	99.7		P	80 - 120
2338497	Antimony	99.9		P	80 - 120
2338497	Arsenic	99.6		P	80 - 120
2338497	Barium	104		P	80 - 120
2338497	Beryllium	87.9		P	80 - 120
2338497	Boron	106		P	80 - 120
2338497	Cadmium	99.6		P	80 - 120
2338497	Chromium	96.7		P	80 - 120
2338497	Cobalt	96.4		P	80 - 120
2338497	Copper	97.5		P	80 - 120
2338497	Lead	96.3		P	80 - 120
2338497	Manganese	97.2		P	80 - 120
2338497	Molybdenum	97.9		P	80 - 120
2338497	Nickel	97.2		P	80 - 120
2338497	Selenium	93.3		P	80 - 120
2338497	Silver	96.2		P	80 - 120
2338497	Thallium	98.7		P	80 - 120
2338614	Aluminum	99.3	99.2	P/P	80 - 120
2338614	Antimony	101	101	P/P	80 - 120
2338614	Arsenic	99.0	99.7	P/P	80 - 120
2338614	Barium	103	102	P/P	80 - 120
2338614	Beryllium	94.3	95.2	P/P	80 - 120
2338614	Boron	101	98.2	P/P	80 - 120
2338614	Cadmium	96.8	97.3	P/P	80 - 120
2338614	Chromium	96.9	96.1	P/P	80 - 120
2338614	Cobalt	96.4	96.1	P/P	80 - 120
2338614	Copper	96.6	96.1	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P416115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338614	Lead	95.9	96.3	P/P	80 - 120
2338614	Manganese	96.1	95.1	P/P	80 - 120
2338614	Molybdenum	98.5	99.1	P/P	80 - 120
2338614	Nickel	97.0	95.4	P/P	80 - 120
2338614	Selenium	95.8	95.5	P/P	80 - 120
2338614	Silver	95.8	95.6	P/P	80 - 120
2338614	Thallium	97.1	99.5	P/P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P416115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338614	Calcium	0.454	Spike	P	0 - 20
2338614	Iron	0.339	Spike	P	0 - 20
2338614	Magnesium	0.815	Spike	P	0 - 20
2338614	Potassium	0.0395	Spike	P	0 - 20
2338614	Sodium	1.88	Spike	P	0 - 20
2338614	Strontium	0.207	Spike	P	0 - 20
2338614	Tin	3.39	Spike	P	0 - 20
2338614	Titanium	0.261	Spike	P	0 - 20
2338614	Vanadium	0.225	Spike	P	0 - 20
2338614	Zinc	2.95	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P416115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338614	Aluminum	0.114	Spike	P	0 - 20
2338614	Antimony	0.366	Spike	P	0 - 20
2338614	Arsenic	0.718	Spike	P	0 - 20
2338614	Barium	0.658	Spike	P	0 - 20
2338614	Beryllium	0.870	Spike	P	0 - 20
2338614	Boron	1.63	Spike	P	0 - 20
2338614	Cadmium	0.483	Spike	P	0 - 20
2338614	Chromium	0.796	Spike	P	0 - 20
2338614	Cobalt	0.345	Spike	P	0 - 20
2338614	Copper	0.533	Spike	P	0 - 20
2338614	Lead	0.348	Spike	P	0 - 20
2338614	Manganese	0.919	Spike	P	0 - 20
2338614	Molybdenum	0.532	Spike	P	0 - 20
2338614	Nickel	1.61	Spike	P	0 - 20
2338614	Selenium	0.316	Spike	P	0 - 20
2338614	Silver	0.236	Spike	P	0 - 20
2338614	Thallium	2.45	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: A113284

Included Lab Sample IDs: 2338497

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	96.9	98.0	P/P	90 - 110
Iron	93.9	96.4	P/P	90 - 110
Magnesium	94.3	96.8	P/P	90 - 110
Potassium	99.7	101	P/P	90 - 110
Sodium	95.4	96.7	P/P	90 - 110
Strontium	103	103	P/P	90 - 110
Tin	104	105	P/P	90 - 110
Titanium	101	104	P/P	90 - 110
Vanadium	103	104	P/P	90 - 110
Zinc	102	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A113322

Included Lab Sample IDs: 2338497

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.9	98.2	P/P	90 - 110
Antimony	99.2	102	P/P	90 - 110
Arsenic	101	100	P/P	90 - 110
Barium	98.9	101	P/P	90 - 110
Beryllium	95.6	92.7	P/P	90 - 110
Boron	99.4	100	P/P	90 - 110
Cadmium	99.7	102	P/P	90 - 110
Chromium	96.8	96.9	P/P	90 - 110
Cobalt	97.5	98.0	P/P	90 - 110
Copper	97.8	98.1	P/P	90 - 110
Lead	95.0	96.0	P/P	90 - 110
Manganese	96.6	98.1	P/P	90 - 110
Molybdenum	99.5	98.5	P/P	90 - 110
Nickel	97.2	98.2	P/P	90 - 110
Selenium	97.9	98.6	P/P	90 - 110
Silver	98.5	99.0	P/P	90 - 110
Thallium	96.5	96.4	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	102	101	100	101			0.454
	Iron	92.2	99.8	102	102			0.339
	Magnesium	94.4	101	102	101			0.815
	Potassium	105	103	103	103			0.0395
	Sodium	97.6	104	98.7				1.88
	Strontium	103	105	105	105			0.207
	Tin	106	108	107	104			3.39
	Titanium	106	96.3	107	107			0.261
	Vanadium	104	107	106	106			0.225
	Zinc	103	107	106	103			2.95
EPA 200.8 Rev. 5.4	Aluminum	97.6	99.3	99.2	99.7			0.114
	Antimony	99.1	101	101	99.9			0.366
	Arsenic	98.3	99.0	99.7	99.6			0.718
	Barium	101	103	102	104			0.658
	Beryllium	91.8	94.3	87.9	95.2			0.870
	Boron	99.4	101	98.2	106			1.63
	Cadmium	95.5	96.8	97.3	99.6			0.483
	Chromium	93.8	96.9	96.1	96.7			0.796
	Cobalt	94.8	96.4	96.1	96.4			0.345
	Copper	94.4	96.6	96.1	97.5			0.533
	Lead	94.8	95.9	96.3	96.3			0.348
	Manganese	94.1	96.1	95.1	97.2			0.919
	Molybdenum	97.9	98.5	99.1	97.9			0.532
	Nickel	96.1	97.0	95.4	97.2			1.61
	Selenium	94.1	95.8	95.5	93.3			0.316
	Silver	97.2	95.8	95.6	96.2			0.236
	Thallium	95.0	97.1	99.5	98.7			2.45

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	2338497
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2338497
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2338497

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	06/30/2022	07/05/2022 09:16	Mackenzie Hunt	07/05/2022 18:30	McKinley C Carter	2338497
EPA 200.8 Rev. 5.4	06/30/2022	07/05/2022 09:16	Mackenzie Hunt	07/06/2022 20:16	Emily M Philpot	2338497
SM 2340 B-2011	06/30/2022			07/05/2022 18:30	McKinley C Carter	2338497