

Chemical Analysis Report

TLH-ROC-2022-08-22-01

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

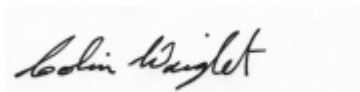
Event Description: **Run 2**
Request ID: **RQ-2022-07-11-58**
Customer: **TLH-ROC**
Project ID: **SMP**

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

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Certified by: Colin Wright, Program Administrator

Date Certified: 08-SEP-2022 15:00

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

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: Steinhatchee River 40m N of Yearling Rd

Collection Date/Time: 08/22/2022 12:25

Field ID: G1TLHR0065

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2351111	EPA 200.7 Rev. 4.4	Calcium	74.5		mg/L	P418558	
		Iron	500		ug/L	P418558	
		Magnesium	7.87		mg/L	P418558	
		Potassium	0.30	U	mg/L	P418558	
		Sodium	4.2		mg/L	P418558	
		Strontium	103		ug/L	P418558	
		Tin	8.5	I	ug/L	P418558	
		Titanium	0.88	I	ug/L	P418558	
		Vanadium	2.0	U	ug/L	P418558	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P418558	
		Aluminum	5.0	U	ug/L	P418558	
		Antimony	0.050	U	ug/L	P418558	
		Arsenic	0.050	U	ug/L	P418558	
		Barium	0.91		ug/L	P418558	
		Beryllium	0.010	U	ug/L	P418558	
		Boron	2.9	I	ug/L	P418558	
		Cadmium	0.020	U	ug/L	P418558	
		Chromium	0.40	U	ug/L	P418558	
		Cobalt	0.020	U	ug/L	P418558	
		Copper	0.40	U	ug/L	P418558	
		Lead	0.20	U	ug/L	P418558	
		Manganese	0.16	I	ug/L	P418558	
		Molybdenum	0.15	U	ug/L	P418558	
		Nickel	0.50	U	ug/L	P418558	
		Selenium	0.20	U	ug/L	P418558	MS
		Silver	0.010	U	ug/L	P418558	
		Thallium	0.10	U	ug/L	P418558	
	SM 2340 B-2011	Hardness	218		mg/L	P418558	

Ref. Method and Comment:

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for magnesium and strontium are unavailable 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: P418558

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: P418558

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: P418558

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	110		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	103		P	85 - 115
Sodium	103		P	85 - 115
Strontium	104		P	85 - 115
Tin	110		P	85 - 115
Titanium	108		P	85 - 115
Vanadium	105		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P418558

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	102		P	85 - 115
Barium	106		P	85 - 115
Beryllium	103		P	85 - 115
Boron	101		P	85 - 115
Cadmium	99.4		P	85 - 115
Chromium	102		P	85 - 115
Cobalt	101		P	85 - 115
Copper	99.2		P	85 - 115
Lead	95.6		P	85 - 115
Manganese	103		P	85 - 115
Molybdenum	98.9		P	85 - 115
Nickel	101		P	85 - 115
Selenium	98.1		P	85 - 115
Silver	98.7		P	85 - 115
Thallium	99.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P418558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2351045	Calcium	97.8		P	80 - 120
2351045	Iron	107	108	P/P	80 - 120
2351045	Potassium	99.6		P	80 - 120
2351045	Sodium	98.4		P	80 - 120
2351045	Tin	103	106	P/P	80 - 120
2351045	Titanium	106	108	P/P	80 - 120
2351045	Vanadium	103	105	P/P	80 - 120
2351045	Zinc	98.7	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P418558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2351045	Aluminum	101	102	P/P	80 - 120
2351045	Antimony	108	110	P/P	80 - 120
2351045	Arsenic	105	107	P/P	80 - 120
2351045	Barium	108	108	P/P	80 - 120
2351045	Beryllium	97.6	98.3	P/P	80 - 120
2351045	Boron	107	106	P/P	80 - 120
2351045	Cadmium	103	103	P/P	80 - 120
2351045	Chromium	107	106	P/P	80 - 120
2351045	Cobalt	99.6	101	P/P	80 - 120
2351045	Copper	97.4	99.0	P/P	80 - 120
2351045	Lead	96.4	96.7	P/P	80 - 120
2351045	Manganese	106	106	P/P	80 - 120
2351045	Molybdenum	106	106	P/P	80 - 120
2351045	Nickel	98.8	99.2	P/P	80 - 120
2351045	Selenium	39.6	39.2	F/F	80 - 120
2351045	Silver	97.4	98.8	P/P	80 - 120
2351045	Thallium	103	105	P/P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P418558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2351045	Calcium	1.16	Spike	P	0 - 20
2351045	Iron	0.717	Spike	P	0 - 20
2351045	Magnesium	0.572	Spike	P	0 - 20
2351045	Potassium	0.343	Spike	P	0 - 20
2351045	Sodium	0.0450	Spike	P	0 - 20
2351045	Strontium	0.516	Spike	P	0 - 20
2351045	Tin	2.72	Spike	P	0 - 20
2351045	Titanium	1.67	Spike	P	0 - 20
2351045	Vanadium	1.79	Spike	P	0 - 20
2351045	Zinc	2.07	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P418558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2351045	Aluminum	0.837	Spike	P	0 - 20
2351045	Antimony	1.60	Spike	P	0 - 20
2351045	Arsenic	1.14	Spike	P	0 - 20
2351045	Barium	0.103	Spike	P	0 - 20
2351045	Beryllium	0.754	Spike	P	0 - 20
2351045	Boron	0.0716	Spike	P	0 - 20
2351045	Cadmium	0.344	Spike	P	0 - 20
2351045	Chromium	0.552	Spike	P	0 - 20
2351045	Cobalt	1.44	Spike	P	0 - 20
2351045	Copper	1.68	Spike	P	0 - 20
2351045	Lead	0.284	Spike	P	0 - 20
2351045	Manganese	0.332	Spike	P	0 - 20
2351045	Molybdenum	0.260	Spike	P	0 - 20
2351045	Nickel	0.394	Spike	P	0 - 20
2351045	Selenium	0.782	Spike	P	0 - 20
2351045	Silver	1.42	Spike	P	0 - 20
2351045	Thallium	1.78	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: A114338

Included Lab Sample IDs: 2351111

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	98.3	P/P	90 - 110
Antimony	102	101	P/P	90 - 110
Arsenic	103	101	P/P	90 - 110
Barium	101	99.9	P/P	90 - 110
Beryllium	99.4	99.1	P/P	90 - 110
Boron	99.1	95.9	P/P	90 - 110
Cadmium	104	103	P/P	90 - 110
Chromium	104	102	P/P	90 - 110
Cobalt	102	100	P/P	90 - 110
Copper	104	99.1	P/P	90 - 110
Lead	93.5	93.0	P/P	90 - 110
Manganese	105	104	P/P	90 - 110
Molybdenum	99.3	98.0	P/P	90 - 110
Nickel	103	100	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	98.2	97.2	P/P	90 - 110
Thallium	105	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A114559

Included Lab Sample IDs: 2351111

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.2	102	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	98.1	98.5	P/P	90 - 110
Sodium	98.2	99.6	P/P	90 - 110
Strontium	94.6	98.2	P/P	90 - 110
Tin	101	104	P/P	90 - 110
Titanium	99.0	101	P/P	90 - 110
Vanadium	97.9	101	P/P	90 - 110
Zinc	98.5	102	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	105	97.8				1.16
	Iron	110	107	108			0.717
	Magnesium	105					0.572
	Potassium	103	99.6				0.343
	Sodium	103	98.4				0.0450
	Strontium	104					0.516
	Tin	110	103	106			2.72
	Titanium	108	106	108			1.67
	Vanadium	105	103	105			1.79
	Zinc	105	98.7	101			2.07
EPA 200.8 Rev. 5.4	Aluminum	101	101	102			0.837
	Antimony	104	108	110			1.60
	Arsenic	102	105	107			1.14
	Barium	106	108	108			0.103
	Beryllium	103	97.6	98.3			0.754
	Boron	101	107	106			0.0716
	Cadmium	99.4	103	103			0.344
	Chromium	102	107	106			0.552
	Cobalt	101	99.6	101			1.44
	Copper	99.2	97.4	99.0			1.68
	Lead	95.6	96.4	96.7			0.284
	Manganese	103	106	106			0.332
	Molybdenum	98.9	106	106			0.260
	Nickel	101	98.8	99.2			0.394
	Selenium	98.1	39.6	39.2			0.782
	Silver	98.7	97.4	98.8			1.42
	Thallium	99.6	103	105			1.78

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	2351111
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2351111
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2351111

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	08/22/2022	08/24/2022 10:10	Megan Whitefoot	09/07/2022 03:36	McKinley C Carter	2351111
EPA 200.8 Rev. 5.4	08/22/2022	08/24/2022 10:10	Megan Whitefoot	08/24/2022 20:41	Emily M Philpot	2351111
SM 2340 B-2011	08/22/2022			09/07/2022 03:36	McKinley C Carter	2351111