

Chemical Analysis Report

CEN-DIST-2023-10-20-03

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

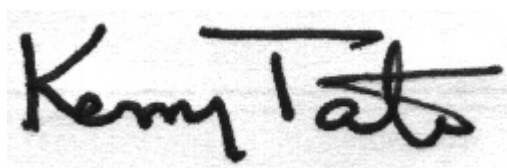
Event Description: **Run 19**
Request ID: **RQ-2023-10-16-13**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Matthew Bearden

For additional information please contact
Colin Wright, Ph.D.
Chris Bowen, B.S.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

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

Date Certified: 02-NOV-2023 10:08

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the 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: SWEETWATER CREEK AT ARTESIA ST

Collection Date/Time: 10/19/2023 10:11

Field ID: G2CE0287

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2446478	EPA 200.7 Rev. 4.4	Calcium	55.5		mg/L	P437046	
		Iron	560		ug/L	P437046	
		Magnesium	7.07		mg/L	P437046	
		Potassium	3.7		mg/L	P437046	
		Sodium	31.9		mg/L	P437046	
		Strontium	188		ug/L	P437046	
		Tin	3.0	U	ug/L	P437046	
		Titanium	11.4		ug/L	P437046	
		Vanadium	2.0	U	ug/L	P437046	
		Zinc	5.0	U	ug/L	P437046	
	EPA 200.8 Rev. 5.4	Aluminum	214		ug/L	P437046	
		Antimony	0.13	I	ug/L	P437046	
		Arsenic	1.49		ug/L	P437046	
		Barium	34.5		ug/L	P437046	
		Beryllium	0.016	I	ug/L	P437046	
		Boron	54.5		ug/L	P437046	
		Cadmium	0.020	U	ug/L	P437046	
		Chromium	0.79	I	ug/L	P437046	
		Cobalt	0.141		ug/L	P437046	
		Copper	1.62		ug/L	P437046	
		Lead	0.60		ug/L	P437046	
		Manganese	34.1		ug/L	P437046	
		Molybdenum	0.67		ug/L	P437046	
		Nickel	0.50	U	ug/L	P437046	
		Selenium	0.20	U	ug/L	P437046	
		Silver	0.010	U	ug/L	P437046	
		Thallium	0.10	U	ug/L	P437046	
	SM 2340 B-2011	Hardness	168		mg/L	P437046	

Sample Location: SWEETWATER CREEK AT HOWARD AVE

Collection Date/Time: 10/19/2023 11:01

Field ID: G2CE0273

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2446479	EPA 200.7 Rev. 4.4	Calcium	68.1		mg/L	P437046	
		Iron	1.34E+03		ug/L	P437046	
		Magnesium	26.4		mg/L	P437046	
		Potassium	9.5		mg/L	P437046	
		Sodium	191		mg/L	P437046	
		Strontium	565		ug/L	P437046	
		Tin	3.0	U	ug/L	P437046	
		Titanium	1.8	I	ug/L	P437046	
		Vanadium	2.0	U	ug/L	P437046	
		Zinc	54		ug/L	P437046	
	EPA 200.8 Rev. 5.4	Aluminum	325		ug/L	P437046	
		Antimony	0.13	I	ug/L	P437046	
		Arsenic	3.43		ug/L	P437046	
		Barium	40.2		ug/L	P437046	
		Beryllium	0.018	I	ug/L	P437046	
		Boron	127		ug/L	P437046	
		Cadmium	0.031	I	ug/L	P437046	
		Chromium	1.0	I	ug/L	P437046	
		Cobalt	0.168		ug/L	P437046	
		Copper	3.31		ug/L	P437046	
	SM 2340 B-2011	Lead	0.75		ug/L	P437046	
		Manganese	374		ug/L	P437046	
		Molybdenum	0.58	I	ug/L	P437046	
		Nickel	0.50	U	ug/L	P437046	
		Selenium	0.20	U	ug/L	P437046	
		Silver	0.010	U	ug/L	P437046	
		Thallium	0.10	U	ug/L	P437046	
		Hardness	279		mg/L	P437046	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P437046

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: P437046

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: P437046

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	111		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	102		P	85 - 115
Sodium	102		P	85 - 115
Strontium	99.0		P	85 - 115
Tin	97.9		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	99.1		P	85 - 115
Zinc	96.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437046

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.3		P	85 - 115
Antimony	96.3		P	85 - 115
Arsenic	95.4		P	85 - 115
Barium	98.9		P	85 - 115
Beryllium	95.5		P	85 - 115
Boron	106		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	99.6		P	85 - 115
Cobalt	92.6		P	85 - 115
Copper	91.3		P	85 - 115
Lead	91.2		P	85 - 115
Manganese	99.9		P	85 - 115
Molybdenum	95.8		P	85 - 115
Nickel	91.0		P	85 - 115
Selenium	95.4		P	85 - 115
Silver	105		P	85 - 115
Thallium	97.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P437046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446388	Calcium	103		P	80 - 120
2446388	Iron	111	110	P/P	80 - 120
2446388	Magnesium	111	109	P/P	80 - 120
2446388	Potassium	102	101	P/P	80 - 120
2446388	Sodium	101		P	80 - 120
2446388	Strontium	97.5	97.5	P/P	80 - 120
2446388	Tin	94.6	94.5	P/P	80 - 120
2446388	Titanium	101	101	P/P	80 - 120
2446388	Vanadium	99.0	98.7	P/P	80 - 120
2446388	Zinc	96.3	96.1	P/P	80 - 120
2446565	Calcium	99.7		P	80 - 120
2446565	Iron	108		P	80 - 120
2446565	Magnesium	102		P	80 - 120
2446565	Potassium	101		P	80 - 120
2446565	Sodium	104		P	80 - 120
2446565	Strontium	96.3		P	80 - 120
2446565	Tin	95.3		P	80 - 120
2446565	Titanium	99.2		P	80 - 120
2446565	Vanadium	97.9		P	80 - 120
2446565	Zinc	93.4		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P437046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446388	Aluminum	96.4	93.9	P/P	80 - 120
2446388	Antimony	96.6	95.8	P/P	80 - 120
2446388	Arsenic	96.2	96.0	P/P	80 - 120
2446388	Barium	99.9	98.9	P/P	80 - 120
2446388	Beryllium	91.0	93.6	P/P	80 - 120
2446388	Boron	107	108	P/P	80 - 120
2446388	Cadmium	102	99.2	P/P	80 - 120
2446388	Chromium	101	99.9	P/P	80 - 120
2446388	Cobalt	92.9	92.5	P/P	80 - 120
2446388	Copper	91.9	92.1	P/P	80 - 120
2446388	Lead	92.6	92.2	P/P	80 - 120
2446388	Manganese	99.8	99.5	P/P	80 - 120
2446388	Molybdenum	97.8	97.1	P/P	80 - 120
2446388	Nickel	90.8	90.6	P/P	80 - 120
2446388	Selenium	93.4	95.9	P/P	80 - 120
2446388	Silver	105	105	P/P	80 - 120
2446388	Thallium	102	102	P/P	80 - 120
2446565	Aluminum	95.3		P	80 - 120
2446565	Antimony	98.7		P	80 - 120
2446565	Arsenic	97.7		P	80 - 120
2446565	Barium	99.8		P	80 - 120
2446565	Beryllium	94.6		P	80 - 120
2446565	Boron	110		P	80 - 120
2446565	Cadmium	103		P	80 - 120
2446565	Chromium	103		P	80 - 120
2446565	Cobalt	92.1		P	80 - 120
2446565	Copper	88.8		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2446565	Lead	92.3		P	80 - 120
2446565	Manganese	101		P	80 - 120
2446565	Molybdenum	101		P	80 - 120
2446565	Nickel	89.1		P	80 - 120
2446565	Selenium	94.5		P	80 - 120
2446565	Silver	107		P	80 - 120
2446565	Thallium	100		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P437046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446388	Calcium	1.30	Spike	P	0 - 20
2446388	Iron	1.46	Spike	P	0 - 20
2446388	Magnesium	0.965	Spike	P	0 - 20
2446388	Potassium	1.47	Spike	P	0 - 20
2446388	Sodium	1.50	Spike	P	0 - 20
2446388	Strontium	0.0394	Spike	P	0 - 20
2446388	Tin	0.0995	Spike	P	0 - 20
2446388	Titanium	0.573	Spike	P	0 - 20
2446388	Vanadium	0.225	Spike	P	0 - 20
2446388	Zinc	0.282	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P437046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2446388	Aluminum	2.52	Spike	P	0 - 20
2446388	Antimony	0.841	Spike	P	0 - 20
2446388	Arsenic	0.270	Spike	P	0 - 20
2446388	Barium	0.890	Spike	P	0 - 20
2446388	Beryllium	2.74	Spike	P	0 - 20
2446388	Boron	0.771	Spike	P	0 - 20
2446388	Cadmium	3.27	Spike	P	0 - 20
2446388	Chromium	0.929	Spike	P	0 - 20
2446388	Cobalt	0.458	Spike	P	0 - 20
2446388	Copper	0.199	Spike	P	0 - 20
2446388	Lead	0.511	Spike	P	0 - 20
2446388	Manganese	0.199	Spike	P	0 - 20
2446388	Molybdenum	0.665	Spike	P	0 - 20
2446388	Nickel	0.206	Spike	P	0 - 20
2446388	Selenium	2.66	Spike	P	0 - 20
2446388	Silver	0.101	Spike	P	0 - 20
2446388	Thallium	0.462	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: A122425

Included Lab Sample IDs: 2446478, 2446479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.9	95.3	P/P	90 - 110
Aluminum	96.9	94.9	P/P	90 - 110
Arsenic	94.7	94.8	P/P	90 - 110
Arsenic	95.8	94.7	P/P	90 - 110
Barium	97.1	96.7	P/P	90 - 110
Barium	98.6	97.1	P/P	90 - 110
Beryllium	95.9	96.3	P/P	90 - 110
Beryllium	96.3	95.6	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Chromium	103	104	P/P	90 - 110
Chromium	104	106	P/P	90 - 110
Cobalt	92.3	93.2	P/P	90 - 110
Cobalt	93.7	92.3	P/P	90 - 110
Copper	90.5	91.4	P/P	90 - 110
Copper	92.4	90.5	P/P	90 - 110
Lead	91.7	92.3	P/P	90 - 110
Lead	91.9	91.7	P/P	90 - 110
Manganese	102	103	P/P	90 - 110
Manganese	103	106	P/P	90 - 110
Molybdenum	97.0	97.2	P/P	90 - 110
Molybdenum	98.1	97.0	P/P	90 - 110
Nickel	91.4	91.1	P/P	90 - 110
Nickel	93.0	91.4	P/P	90 - 110
Selenium	98.7	99.3	P/P	90 - 110
Selenium	99.3	97.7	P/P	90 - 110
Silver	99.1	99.6	P/P	90 - 110
Silver	99.6	99.2	P/P	90 - 110
Thallium	98.5	99.0	P/P	90 - 110
Thallium	99.0	98.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A122428

Included Lab Sample IDs: 2446478, 2446479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	100	101	P/P	90 - 110
Sodium	99.3	99.6	P/P	90 - 110
Strontium	97.2	98.2	P/P	90 - 110
Tin	100	99.8	P/P	90 - 110
Titanium	100	100	P/P	90 - 110
Vanadium	99.4	99.3	P/P	90 - 110
Zinc	99.9	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A122445

Included Lab Sample IDs: 2446478, 2446479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	96.0	97.0	P/P	90 - 110
Boron	104	106	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	103	99.7				1.30
	Iron	111	111	110	108			1.46
	Magnesium	112	111	109	102			0.965
	Potassium	102	102	101	101			1.47
	Sodium	102	101	104				1.50
	Strontium	99.0	97.5	97.5	96.3			0.0394
	Tin	97.9	94.6	94.5	95.3			0.0995
	Titanium	101	101	101	99.2			0.573
	Vanadium	99.1	99.0	98.7	97.9			0.225
	Zinc	96.9	96.3	96.1	93.4			0.282
EPA 200.8 Rev. 5.4	Aluminum	95.3	96.4	93.9	95.3			2.52
	Antimony	96.3	96.6	95.8	98.7			0.841
	Arsenic	95.4	96.2	96.0	97.7			0.270
	Barium	98.9	99.9	98.9	99.8			0.890
	Beryllium	95.5	91.0	93.6	94.6			2.74
	Boron	106	107	108	110			0.771
	Cadmium	100	102	99.2	103			3.27
	Chromium	99.6	101	99.9	103			0.929
	Cobalt	92.6	92.9	92.5	92.1			0.458
	Copper	91.3	91.9	92.1	88.8			0.199
	Lead	91.2	92.6	92.2	92.3			0.511
	Manganese	99.9	99.8	99.5	101			0.199
	Molybdenum	95.8	97.8	97.1	101			0.665
	Nickel	91.0	90.8	90.6	89.1			0.206
	Selenium	95.4	93.4	95.9	94.5			2.66
	Silver	105	105	105	107			0.101
	Thallium	97.2	102	102	100			0.462

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	2446478, 2446479
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2446478, 2446479
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2446478, 2446479

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	10/20/2023	10/26/2023 14:35	George D Taylor	10/27/2023 20:32	Chase Roberts	2446478
	10/20/2023	10/26/2023 14:35	George D Taylor	10/27/2023 20:39	Chase Roberts	2446479
EPA 200.8 Rev. 5.4	10/20/2023	10/26/2023 14:35	George D Taylor	10/28/2023 01:21	Conrad Hartmann	2446478
	10/20/2023	10/26/2023 14:35	George D Taylor	10/28/2023 02:19	Conrad Hartmann	2446479
	10/20/2023	10/26/2023 14:35	George D Taylor	10/30/2023 19:19	Conrad Hartmann	2446478
	10/20/2023	10/26/2023 14:35	George D Taylor	10/30/2023 19:25	Conrad Hartmann	2446479
	10/20/2023			10/27/2023 20:32	Chase Roberts	2446478
SM 2340 B-2011	10/20/2023			10/27/2023 20:39	Chase Roberts	2446479