

Chemical Analysis Report

CEN-DIST-2023-08-18-03

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

Event Description: **Run 7**
Request ID: **RQ-2023-07-31-12**
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
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 07-SEP-2023 10:22



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: ALLIGATOR LAKE AT CENTER OF SOUTH LOBE

Collection Date/Time: 08/17/2023 11:03

Field ID: G4CE0170

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2432154	EPA 200.7 Rev. 4.4	Calcium	5.57		mg/L	P434124	
		Iron	720		ug/L	P434124	
		Magnesium	2.86		mg/L	P434124	
		Potassium	3.0		mg/L	P434124	
		Sodium	15.1		mg/L	P434124	
		Strontium	36.8		ug/L	P434124	
		Tin	3.0	U	ug/L	P434124	
		Titanium	1.0	I	ug/L	P434124	
		Vanadium	2.0	U	ug/L	P434124	
		Zinc	5.0	U	ug/L	P434124	
	EPA 200.8 Rev. 5.4	Aluminum	217		ug/L	P434124	
		Antimony	0.067	I	ug/L	P434124	
		Arsenic	0.80		ug/L	P434124	
		Barium	16.2		ug/L	P434124	
		Beryllium	0.020	I	ug/L	P434124	
		Boron	33.2		ug/L	P434124	
		Cadmium	0.020	U	ug/L	P434124	
		Chromium	0.47	I	ug/L	P434124	
		Cobalt	0.065	I	ug/L	P434124	
		Copper	0.90		ug/L	P434124	
	SM 2340 B-2011	Lead	0.63		ug/L	P434124	
		Manganese	9.99		ug/L	P434124	
		Molybdenum	0.15	U	ug/L	P434124	
		Nickel	0.50	U	ug/L	P434124	
		Selenium	0.20	U	ug/L	P434124	
		Silver	0.010	U	ug/L	P434124	
		Thallium	0.10	U	ug/L	P434124	
		Hardness	25.7		mg/L	P434124	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 08/25/2023.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P434124

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: P434124

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: P434124

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	103		P	85 - 115
Sodium	99.9		P	85 - 115
Strontium	101		P	85 - 115
Tin	105		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P434124

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.3		P	85 - 115
Antimony	98.5		P	85 - 115
Arsenic	93.5		P	85 - 115
Barium	100		P	85 - 115
Beryllium	91.7		P	85 - 115
Boron	100		P	85 - 115
Cadmium	97.0		P	85 - 115
Chromium	92.5		P	85 - 115
Cobalt	90.0		P	85 - 115
Copper	93.8		P	85 - 115
Lead	95.4		P	85 - 115
Manganese	97.3		P	85 - 115
Molybdenum	94.2		P	85 - 115
Nickel	89.8		P	85 - 115
Selenium	96.2		P	85 - 115
Silver	108		P	85 - 115
Thallium	96.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P434124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432078	Calcium	106	102	P/P	80 - 120
2432078	Iron	105	103	P/P	80 - 120
2432078	Magnesium	104	103	P/P	80 - 120
2432078	Potassium	103	99.2	P/P	80 - 120
2432078	Sodium	97.9		P	80 - 120
2432078	Strontium	100	98.6	P/P	80 - 120
2432078	Tin	105	100	P/P	80 - 120
2432078	Titanium	104	101	P/P	80 - 120
2432078	Vanadium	104	101	P/P	80 - 120
2432078	Zinc	106	103	P/P	80 - 120
2432154	Calcium	99.2		P	80 - 120
2432154	Iron	100		P	80 - 120
2432154	Magnesium	98.6		P	80 - 120
2432154	Potassium	96.9		P	80 - 120
2432154	Sodium	99.3		P	80 - 120
2432154	Strontium	96.1		P	80 - 120
2432154	Tin	96.6		P	80 - 120
2432154	Titanium	96.5		P	80 - 120
2432154	Vanadium	98.4		P	80 - 120
2432154	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P434124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432078	Aluminum	97.1	98.2	P/P	80 - 120
2432078	Antimony	98.6	97.5	P/P	80 - 120
2432078	Arsenic	94.0	93.6	P/P	80 - 120
2432078	Barium	99.1	99.0	P/P	80 - 120
2432078	Beryllium	92.2	91.6	P/P	80 - 120
2432078	Boron	101	101	P/P	80 - 120
2432078	Cadmium	97.1	95.9	P/P	80 - 120
2432078	Chromium	93.1	93.3	P/P	80 - 120
2432078	Cobalt	89.4	89.4	P/P	80 - 120
2432078	Copper	95.4	95.6	P/P	80 - 120
2432078	Lead	96.1	97.1	P/P	80 - 120
2432078	Manganese	96.5	95.8	P/P	80 - 120
2432078	Molybdenum	94.8	94.6	P/P	80 - 120
2432078	Nickel	89.7	89.2	P/P	80 - 120
2432078	Selenium	97.3	94.1	P/P	80 - 120
2432078	Silver	106	105	P/P	80 - 120
2432078	Thallium	98.3	99.2	P/P	80 - 120
2432154	Aluminum	98.2		P	80 - 120
2432154	Antimony	97.7		P	80 - 120
2432154	Arsenic	92.2		P	80 - 120
2432154	Barium	98.1		P	80 - 120
2432154	Beryllium	89.2		P	80 - 120
2432154	Boron	102		P	80 - 120
2432154	Cadmium	97.0		P	80 - 120
2432154	Chromium	91.9		P	80 - 120
2432154	Cobalt	91.1		P	80 - 120
2432154	Copper	92.1		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P434124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432154	Lead	95.0		P	80 - 120
2432154	Manganese	95.6		P	80 - 120
2432154	Molybdenum	94.5		P	80 - 120
2432154	Nickel	92.9		P	80 - 120
2432154	Selenium	93.7		P	80 - 120
2432154	Silver	105		P	80 - 120
2432154	Thallium	98.5		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P434124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432078	Calcium	2.49	Spike	P	0 - 20
2432078	Iron	1.01	Spike	P	0 - 20
2432078	Magnesium	1.16	Spike	P	0 - 20
2432078	Potassium	2.95	Spike	P	0 - 20
2432078	Sodium	1.82	Spike	P	0 - 20
2432078	Strontium	1.44	Spike	P	0 - 20
2432078	Tin	4.19	Spike	P	0 - 20
2432078	Titanium	2.76	Spike	P	0 - 20
2432078	Vanadium	2.92	Spike	P	0 - 20
2432078	Zinc	2.28	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P434124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432078	Aluminum	1.01	Spike	P	0 - 20
2432078	Antimony	1.04	Spike	P	0 - 20
2432078	Arsenic	0.482	Spike	P	0 - 20
2432078	Barium	0.136	Spike	P	0 - 20
2432078	Beryllium	0.705	Spike	P	0 - 20
2432078	Boron	0.124	Spike	P	0 - 20
2432078	Cadmium	1.24	Spike	P	0 - 20
2432078	Chromium	0.266	Spike	P	0 - 20
2432078	Cobalt	0.0368	Spike	P	0 - 20
2432078	Copper	0.215	Spike	P	0 - 20
2432078	Lead	1.03	Spike	P	0 - 20
2432078	Manganese	0.683	Spike	P	0 - 20
2432078	Molybdenum	0.221	Spike	P	0 - 20
2432078	Nickel	0.636	Spike	P	0 - 20
2432078	Selenium	3.33	Spike	P	0 - 20
2432078	Silver	0.675	Spike	P	0 - 20
2432078	Thallium	0.894	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: A121188

Included Lab Sample IDs: 2432154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.1	96.8	P/P	90 - 110
Antimony	95.7	95.5	P/P	90 - 110
Arsenic	94.3	93.3	P/P	90 - 110
Barium	97.0	97.4	P/P	90 - 110
Beryllium	92.4	92.3	P/P	90 - 110
Boron	99.9	99.7	P/P	90 - 110
Cadmium	96.8	96.3	P/P	90 - 110
Chromium	94.5	94.8	P/P	90 - 110
Copper	93.0	92.0	P/P	90 - 110
Manganese	97.3	97.1	P/P	90 - 110
Molybdenum	93.7	92.7	P/P	90 - 110
Selenium	97.7	96.1	P/P	90 - 110
Silver	92.3	92.1	P/P	90 - 110
Thallium	93.7	93.3	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A121209

Included Lab Sample IDs: 2432154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	95.8	95.3	P/P	90 - 110
Iron	100	96.2	P/P	90 - 110
Magnesium	100	96.6	P/P	90 - 110
Potassium	99.4	95.2	P/P	90 - 110
Sodium	98.0	96.2	P/P	90 - 110
Strontium	98.7	95.3	P/P	90 - 110
Tin	99.1	96.5	P/P	90 - 110
Titanium	99.0	95.5	P/P	90 - 110
Vanadium	99.2	96.3	P/P	90 - 110
Zinc	100	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A121217

Included Lab Sample IDs: 2432154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cobalt	92.5	91.3	P/P	90 - 110
Lead	93.7	92.9	P/P	90 - 110
Nickel	93.6	92.5	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 SMP	MS
			LCS				
EPA 200.7 Rev. 4.4	Calcium	105	99.2	106	102		2.49
	Iron	105	105	103	100		1.01
	Magnesium	105	104	103	98.6		1.16
	Potassium	103	103	99.2	96.9		2.95
	Sodium	99.9	97.9	99.3			1.82
	Strontium	101	100	98.6	96.1		1.44
	Tin	105	105	100	96.6		4.19
	Titanium	102	104	101	96.5		2.76
	Vanadium	101	104	101	98.4		2.92
	Zinc	103	106	103	101		2.28
EPA 200.8 Rev. 5.4	Aluminum	97.3	97.1	98.2	98.2		1.01
	Antimony	98.5	98.6	97.5	97.7		1.04
	Arsenic	93.5	94.0	93.6	92.2		0.482
	Barium	100	99.1	99.0	98.1		0.136
	Beryllium	91.7	92.2	91.6	89.2		0.705
	Boron	100	101	101	102		0.124
	Cadmium	97.0	97.1	95.9	97.0		1.24
	Chromium	92.5	93.1	93.3	91.9		0.266
	Cobalt	90.0	89.4	89.4	91.1		0.0368
	Copper	93.8	95.4	95.6	92.1		0.215
	Lead	95.4	96.1	97.1	95.0		1.03
	Manganese	97.3	96.5	95.8	95.6		0.683
	Molybdenum	94.2	94.8	94.6	94.5		0.221
	Nickel	89.8	89.7	89.2	92.9		0.636
	Selenium	96.2	97.3	94.1	93.7		3.33
	Silver	108	106	105	105		0.675
	Thallium	96.3	98.3	99.2	98.5		0.894

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	2432154
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2432154
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2432154

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	08/18/2023	08/21/2023 12:45	George D Taylor	08/23/2023 14:47	Samatha Luckman	2432154
EPA 200.8 Rev. 5.4	08/18/2023	08/21/2023 12:45	George D Taylor	08/22/2023 19:59	Conrad Hartmann	2432154
	08/18/2023	08/21/2023 12:45	George D Taylor	08/23/2023 15:00	Conrad Hartmann	2432154
SM 2340 B-2011	08/18/2023			08/23/2023 14:47	Samatha Luckman	2432154