Chemical Analysis Report

CEN-DIST-2023-08-01-02

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

Event Description: **SJR Above Winder**
Request ID: **RQ-2023-07-31-08**
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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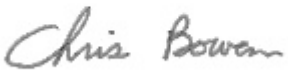
Certified by: Chris Bowen, Environmental Administrator

Date Certified: 16-AUG-2023 11:48



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: SJR ~ 700M UPSTREAM OF LAKE WINDER **Collection Date/Time: 07/31/2023 10:46**

Field ID: G3CE0030 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2427769	EPA 200.7 Rev. 4.4	Calcium	36.3		mg/L	P433394	
		Iron	470		ug/L	P433394	
		Magnesium	8.18		mg/L	P433394	
		Potassium	2.4		mg/L	P433394	
		Sodium	44.9		mg/L	P433394	
		Strontium	1.07E+03		ug/L	P433394	
		Tin	3.0	U	ug/L	P433394	
		Titanium	0.90	I	ug/L	P433394	
		Vanadium	2.0	U	ug/L	P433394	
		Zinc	5.0	U	ug/L	P433394	
	EPA 200.8 Rev. 5.4	Aluminum	148		ug/L	P433394	
		Antimony	0.050	U	ug/L	P433394	
		Arsenic	0.92		ug/L	P433394	
		Barium	25.1		ug/L	P433394	
		Beryllium	0.015	I	ug/L	P433394	
		Boron	37.1		ug/L	P433394	
		Cadmium	0.020	U	ug/L	P433394	
		Chromium	0.40	U	ug/L	P433394	
		Cobalt	0.148		ug/L	P433394	
		Copper	0.40	U	ug/L	P433394	
		Lead	0.20	U	ug/L	P433394	
		Manganese	13.5		ug/L	P433394	
		Molybdenum	0.42	I	ug/L	P433394	
		Nickel	10.8		ug/L	P433394	
		Selenium	0.20	U	ug/L	P433394	
		Silver	0.010	U	ug/L	P433553	
		Thallium	0.10	U	ug/L	P433394	
	SM 2340 B-2011	Hardness	124		mg/L	P433394	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P433394

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: P433394

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
Thallium	0.10	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433553

Component	Result	Code	Units
Silver	0.010	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P433394

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	107		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	102		P	85 - 115
Sodium	104		P	85 - 115
Strontium	100		P	85 - 115
Tin	104		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433394

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.3		P	85 - 115
Antimony	96.8		P	85 - 115
Arsenic	98.6		P	85 - 115
Barium	97.7		P	85 - 115
Beryllium	90.0		P	85 - 115
Boron	106		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	95.0		P	85 - 115
Cobalt	104		P	85 - 115
Copper	101		P	85 - 115
Lead	96.6		P	85 - 115
Manganese	96.1		P	85 - 115
Molybdenum	98.9		P	85 - 115
Nickel	103		P	85 - 115
Selenium	94.1		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Silver	112		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P433394

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427825	Calcium	102	104	P/P	80 - 120
2427825	Iron	105	106	P/P	80 - 120
2427825	Magnesium	104	105	P/P	80 - 120
2427825	Potassium	101	102	P/P	80 - 120
2427825	Sodium	102	104	P/P	80 - 120
2427825	Strontium	101	101	P/P	80 - 120
2427825	Tin	102	105	P/P	80 - 120
2427825	Titanium	101	102	P/P	80 - 120
2427825	Vanadium	102	103	P/P	80 - 120
2427825	Zinc	100	101	P/P	80 - 120
2428063	Calcium	103		P	80 - 120
2428063	Iron	107		P	80 - 120
2428063	Magnesium	105		P	80 - 120
2428063	Potassium	103		P	80 - 120
2428063	Sodium	102		P	80 - 120
2428063	Strontium	101		P	80 - 120
2428063	Tin	106		P	80 - 120
2428063	Titanium	103		P	80 - 120
2428063	Vanadium	103		P	80 - 120
2428063	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433394

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427825	Aluminum	95.8	97.5	P/P	80 - 120
2427825	Antimony	96.6	98.1	P/P	80 - 120
2427825	Arsenic	97.5	98.0	P/P	80 - 120
2427825	Barium	96.3	99.9	P/P	80 - 120
2427825	Beryllium	87.9	89.1	P/P	80 - 120
2427825	Boron	103	105	P/P	80 - 120
2427825	Cadmium	98.7	99.9	P/P	80 - 120
2427825	Chromium	95.3	97.5	P/P	80 - 120
2427825	Cobalt	99.9	102	P/P	80 - 120
2427825	Copper	105	102	P/P	80 - 120
2427825	Lead	96.5	98.8	P/P	80 - 120
2427825	Manganese	96.1	98.3	P/P	80 - 120
2427825	Molybdenum	99.3	100	P/P	80 - 120
2427825	Nickel	98.8	101	P/P	80 - 120
2427825	Selenium	91.0	93.5	P/P	80 - 120
2427825	Thallium	103	105	P/P	80 - 120
2428063	Aluminum	95.0		P	80 - 120
2428063	Antimony	99.7		P	80 - 120
2428063	Arsenic	98.2		P	80 - 120
2428063	Barium	98.5		P	80 - 120
2428063	Beryllium	91.4		P	80 - 120
2428063	Boron	104		P	80 - 120
2428063	Cadmium	102		P	80 - 120
2428063	Chromium	94.9		P	80 - 120
2428063	Cobalt	99.5		P	80 - 120
2428063	Copper	97.9		P	80 - 120
2428063	Lead	98.1		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433394

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2428063	Manganese	95.1		P	80 - 120
2428063	Molybdenum	101		P	80 - 120
2428063	Nickel	97.7		P	80 - 120
2428063	Selenium	91.0		P	80 - 120
2428063	Thallium	106		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2428843	Silver	108	110	P/P	80 - 120
2428959	Silver	112		P	80 - 120

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P433394

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427825	Calcium	0.944	Spike	P	0 - 20
2427825	Iron	1.23	Spike	P	0 - 20
2427825	Magnesium	1.12	Spike	P	0 - 20
2427825	Potassium	0.954	Spike	P	0 - 20
2427825	Sodium	1.21	Spike	P	0 - 20
2427825	Strontium	0.850	Spike	P	0 - 20
2427825	Tin	2.71	Spike	P	0 - 20
2427825	Titanium	1.18	Spike	P	0 - 20
2427825	Vanadium	0.664	Spike	P	0 - 20
2427825	Zinc	0.838	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433394

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427825	Aluminum	1.49	Spike	P	0 - 20
2427825	Antimony	1.55	Spike	P	0 - 20
2427825	Arsenic	0.455	Spike	P	0 - 20
2427825	Barium	2.97	Spike	P	0 - 20
2427825	Beryllium	1.22	Spike	P	0 - 20
2427825	Boron	1.88	Spike	P	0 - 20
2427825	Cadmium	1.19	Spike	P	0 - 20
2427825	Chromium	2.24	Spike	P	0 - 20
2427825	Cobalt	2.49	Spike	P	0 - 20
2427825	Copper	2.73	Spike	P	0 - 20
2427825	Lead	2.41	Spike	P	0 - 20
2427825	Manganese	1.61	Spike	P	0 - 20
2427825	Molybdenum	0.926	Spike	P	0 - 20
2427825	Nickel	2.31	Spike	P	0 - 20
2427825	Selenium	2.71	Spike	P	0 - 20
2427825	Thallium	1.75	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433553

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2428843	Silver	1.43	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: A120863
Included Lab Sample IDs: 2427769

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.4	95.8	P/P	90 - 110
Antimony	94.0	96.2	P/P	90 - 110
Arsenic	100	97.7	P/P	90 - 110
Barium	97.3	94.4	P/P	90 - 110
Beryllium	93.0	92.2	P/P	90 - 110
Boron	99.4	98.4	P/P	90 - 110
Cadmium	97.3	98.2	P/P	90 - 110
Chromium	95.2	96.5	P/P	90 - 110
Cobalt	104	101	P/P	90 - 110
Copper	102	99.0	P/P	90 - 110
Lead	96.8	95.9	P/P	90 - 110
Manganese	96.1	97.4	P/P	90 - 110
Molybdenum	98.3	98.8	P/P	90 - 110
Nickel	103	99.1	P/P	90 - 110
Selenium	95.9	97.3	P/P	90 - 110
Thallium	102	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A120873
Included Lab Sample IDs: 2427769

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	100	102	P/P	90 - 110
Potassium	99.3	101	P/P	90 - 110
Sodium	100	102	P/P	90 - 110
Strontium	101	99.6	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Titanium	101	100	P/P	90 - 110
Vanadium	101	99.7	P/P	90 - 110
Zinc	100	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A120955
Included Lab Sample IDs: 2427769

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	96.7	98.6	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	104	102	104	103			0.944
	Iron	107	106	107	105			1.23
	Magnesium	106	104	105	105			1.12
	Potassium	102	101	102	103			0.954
	Sodium	104	102	104	102			1.21
	Strontium	100	101	101	101			0.850
	Tin	104	102	105	106			2.71
	Titanium	102	101	102	103			1.18
	Vanadium	101	102	103	103			0.664
	Zinc	100	100	101	102			0.838
EPA 200.8 Rev. 5.4	Aluminum	98.3	95.8	97.5	95.0			1.49
	Antimony	96.8	96.6	98.1	99.7			1.55
	Arsenic	98.6	97.5	98.0	98.2			0.455
	Barium	97.7	96.3	99.9	98.5			2.97
	Beryllium	90.0	87.9	89.1	91.4			1.22
	Boron	106	105	104	103			1.88
	Cadmium	98.9	98.7	99.9	102			1.19
	Chromium	95.0	95.3	97.5	94.9			2.24
	Cobalt	104	99.9	102	99.5			2.49
	Copper	101	105	102	97.9			2.73
	Lead	96.6	96.5	98.8	98.1			2.41
	Manganese	96.1	96.1	98.3	95.1			1.61
	Molybdenum	98.9	99.3	100	101			0.926
	Nickel	103	98.8	101	97.7			2.31
	Selenium	94.1	91.0	93.5	91.0			2.71
	Silver	112	108	110	112			1.43
	Thallium	102	103	105	106			1.75

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	2427769
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2427769
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2427769

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	08/01/2023	08/03/2023 13:05	George D Taylor	08/04/2023 17:10	Samatha Luckman	2427769
EPA 200.8 Rev. 5.4	08/01/2023	08/03/2023 13:05	George D Taylor	08/04/2023 19:15	Emily M Philpot	2427769
	08/01/2023	08/08/2023 11:55	George D Taylor	08/09/2023 15:22	Emily M Philpot	2427769
SM 2340 B-2011	08/01/2023			08/04/2023 17:10	Samatha Luckman	2427769