Chemical Analysis Report

CEN-DIST-2023-11-07-02

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

Event Description: **SJR Above Winder**
Request ID: **RQ-2023-08-28-16**
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: Colin Wright, Program Administrator

Date Certified: 17-NOV-2023 08:50

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: 11/06/2023 11:33**

Field ID: G3CE0030 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2449456	EPA 200.7 Rev. 4.4	Calcium	31.8		mg/L	P437629	
		Iron	360		ug/L	P437629	
		Magnesium	6.64		mg/L	P437629	
		Potassium	2.2		mg/L	P437629	
		Sodium	31.5		mg/L	P437629	
		Strontium	802		ug/L	P437629	
		Tin	3.0	U	ug/L	P437629	
		Titanium	1.3	I	ug/L	P437629	
		Vanadium	2.0	U	ug/L	P437629	
		Zinc	5.0	U	ug/L	P437629	
	EPA 200.8 Rev. 5.4	Aluminum	44		ug/L	P437629	
		Antimony	0.050	U	ug/L	P437629	
		Arsenic	0.48		ug/L	P437629	
		Barium	18.6		ug/L	P437629	
		Beryllium	0.010	I	ug/L	P437629	
		Boron	29.4		ug/L	P437629	
		Cadmium	0.020	U	ug/L	P437629	
		Chromium	0.40	U	ug/L	P437629	
		Cobalt	0.086		ug/L	P437629	
		Copper	0.40	U	ug/L	P437629	
		Lead	0.20	U	ug/L	P437629	
		Manganese	5.27		ug/L	P437629	
		Molybdenum	0.15	U	ug/L	P437629	
		Nickel	0.50	U	ug/L	P437629	
		Selenium	0.20	U	ug/L	P437629	
		Silver	0.010	U	ug/L	P437629	
		Thallium	0.10	U	ug/L	P437629	
	SM 2340 B-2011	Hardness	107		mg/L	P437629	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for titanium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for aluminum are unavailable for one of two spiked samples 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: P437629

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: P437629

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: P437629

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	111		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	102		P	85 - 115
Sodium	107		P	85 - 115
Strontium	99.2		P	85 - 115
Tin	97.9		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	99.4		P	85 - 115
Zinc	98.1		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437629

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	99.9		P	85 - 115
Arsenic	100		P	85 - 115
Barium	104		P	85 - 115
Beryllium	97.4		P	85 - 115
Boron	102		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	96.3		P	85 - 115
Cobalt	99.3		P	85 - 115
Copper	101		P	85 - 115
Lead	97.4		P	85 - 115
Manganese	106		P	85 - 115
Molybdenum	92.1		P	85 - 115
Nickel	99.5		P	85 - 115
Selenium	101		P	85 - 115
Silver	101		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: P437629

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2449630	Calcium	101		P	80 - 120
2449630	Iron	107	106	P/P	80 - 120
2449630	Magnesium	100		P	80 - 120
2449630	Potassium	106	105	P/P	80 - 120
2449630	Sodium	106	103	P/P	80 - 120
2449630	Strontium	96.5	95.5	P/P	80 - 120
2449630	Tin	93.3	92.5	P/P	80 - 120
2449630	Vanadium	96.9	96.5	P/P	80 - 120
2449630	Zinc	94.5	95.0	P/P	80 - 120
2449954	Calcium	102		P	80 - 120
2449954	Iron	109		P	80 - 120
2449954	Magnesium	108		P	80 - 120
2449954	Potassium	100		P	80 - 120
2449954	Sodium	101		P	80 - 120
2449954	Strontium	97.0		P	80 - 120
2449954	Tin	93.3		P	80 - 120
2449954	Titanium	99.1		P	80 - 120
2449954	Vanadium	98.7		P	80 - 120
2449954	Zinc	97.8		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437629

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2449630	Antimony	95.5	94.9	P/P	80 - 120
2449630	Arsenic	100	101	P/P	80 - 120
2449630	Barium	104	103	P/P	80 - 120
2449630	Beryllium	97.6	96.1	P/P	80 - 120
2449630	Boron	102	105	P/P	80 - 120
2449630	Cadmium	99.8	102	P/P	80 - 120
2449630	Chromium	99.7	94.7	P/P	80 - 120
2449630	Cobalt	97.6	98.7	P/P	80 - 120
2449630	Copper	98.6	99.1	P/P	80 - 120
2449630	Lead	100	100	P/P	80 - 120
2449630	Manganese	109	110	P/P	80 - 120
2449630	Molybdenum	93.0	93.6	P/P	80 - 120
2449630	Nickel	96.5	96.8	P/P	80 - 120
2449630	Selenium	98.2	101	P/P	80 - 120
2449630	Silver	102	103	P/P	80 - 120
2449630	Thallium	103	103	P/P	80 - 120
2449954	Aluminum	101		P	80 - 120
2449954	Antimony	102		P	80 - 120
2449954	Arsenic	101		P	80 - 120
2449954	Barium	103		P	80 - 120
2449954	Beryllium	99.4		P	80 - 120
2449954	Boron	102		P	80 - 120
2449954	Cadmium	103		P	80 - 120
2449954	Chromium	95.1		P	80 - 120
2449954	Cobalt	96.9		P	80 - 120
2449954	Copper	98.9		P	80 - 120
2449954	Lead	99.5		P	80 - 120
2449954	Manganese	108		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437629

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2449954	Molybdenum	96.0		P	80 - 120
2449954	Nickel	96.9		P	80 - 120
2449954	Selenium	96.6		P	80 - 120
2449954	Silver	99.7		P	80 - 120
2449954	Thallium	102		P	80 - 120

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2449630	Calcium	2.60	Spike	P	0 - 20
2449630	Iron	0.489	Spike	P	0 - 20
2449630	Magnesium	1.89	Spike	P	0 - 20
2449630	Potassium	0.905	Spike	P	0 - 20
2449630	Sodium	2.11	Spike	P	0 - 20
2449630	Strontium	1.03	Spike	P	0 - 20
2449630	Tin	0.816	Spike	P	0 - 20
2449630	Titanium	4.50	Spike	P	0 - 20
2449630	Vanadium	0.415	Spike	P	0 - 20
2449630	Zinc	0.466	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2449630	Aluminum	4.67	Spike	P	0 - 20
2449630	Antimony	0.648	Spike	P	0 - 20
2449630	Arsenic	1.02	Spike	P	0 - 20
2449630	Barium	0.800	Spike	P	0 - 20
2449630	Beryllium	1.23	Spike	P	0 - 20
2449630	Boron	1.89	Spike	P	0 - 20
2449630	Cadmium	1.99	Spike	P	0 - 20
2449630	Chromium	3.76	Spike	P	0 - 20
2449630	Cobalt	1.03	Spike	P	0 - 20
2449630	Copper	0.426	Spike	P	0 - 20
2449630	Lead	0.180	Spike	P	0 - 20
2449630	Manganese	0.766	Spike	P	0 - 20
2449630	Molybdenum	0.528	Spike	P	0 - 20
2449630	Nickel	0.243	Spike	P	0 - 20
2449630	Selenium	3.19	Spike	P	0 - 20
2449630	Silver	0.760	Spike	P	0 - 20
2449630	Thallium	0.00546	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: A122698
Included Lab Sample IDs: 2449456

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	100	100	P/P	90 - 110
Sodium	99.7	100	P/P	90 - 110
Strontium	99.5	97.9	P/P	90 - 110
Tin	99.7	98.7	P/P	90 - 110
Titanium	101	100	P/P	90 - 110
Vanadium	99.3	98.8	P/P	90 - 110
Zinc	99.8	99.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A122699
Included Lab Sample IDs: 2449456

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	100	P/P	90 - 110
Arsenic	101	98.6	P/P	90 - 110
Barium	100	100	P/P	90 - 110
Beryllium	100	103	P/P	90 - 110
Boron	98.6	103	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Chromium	98.4	98.1	P/P	90 - 110
Cobalt	97.9	95.3	P/P	90 - 110
Copper	101	96.8	P/P	90 - 110
Lead	100	98.7	P/P	90 - 110
Manganese	108	107	P/P	90 - 110
Molybdenum	93.5	94.0	P/P	90 - 110
Nickel	102	99.1	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	95.5	95.9	P/P	90 - 110
Thallium	97.2	96.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A122718
Included Lab Sample IDs: 2449456

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	97.5	98.1	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	105	101	102				2.60
	Iron	111	107	106	109			0.489
	Magnesium	105	100	108				1.89
	Potassium	102	106	105	100			0.905
	Sodium	107	106	103	101			2.11
	Strontium	99.2	96.5	95.5	97.0			1.03
	Tin	97.9	93.3	92.5	93.3			0.816
	Titanium	101	99.1					4.50
	Vanadium	99.4	96.9	96.5	98.7			0.415
	Zinc	98.1	94.5	95.0	97.8			0.466
EPA 200.8 Rev. 5.4	Aluminum	102	101					4.67
	Antimony	99.9	95.5	94.9	102			0.648
	Arsenic	100	100	101	101			1.02
	Barium	104	104	103	103			0.800
	Beryllium	97.4	97.6	96.1	99.4			1.23
	Boron	102	102	105	102			1.89
	Cadmium	100	99.8	102	103			1.99
	Chromium	96.3	99.7	94.7	95.1			3.76
	Cobalt	99.3	97.6	98.7	96.9			1.03
	Copper	101	98.9	98.6	99.1			0.426
	Lead	97.4	100	100	99.5			0.180
	Manganese	106	109	110	108			0.766
	Molybdenum	92.1	93.0	93.6	96.0			0.528
	Nickel	99.5	96.5	96.8	96.9			0.243
	Selenium	101	98.2	101	96.6			3.19
	Silver	101	102	103	99.7			0.760
	Thallium	99.6	103	103	102			0.0054

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	2449456
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2449456
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2449456

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	11/07/2023	11/09/2023 13:40	George D Taylor	11/13/2023 18:50	Chase Roberts	2449456
EPA 200.8 Rev. 5.4	11/07/2023	11/09/2023 13:40	George D Taylor	11/13/2023 20:33	Emily M Philpot	2449456
	11/07/2023	11/09/2023 13:40	George D Taylor	11/14/2023 16:17	Emily M Philpot	2449456
SM 2340 B-2011	11/07/2023			11/13/2023 18:50	Chase Roberts	2449456