

Chemical Analysis Report

NW-DIST-2022-10-12-03

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

Event Description: **Holmes Run**
Request ID: **RQ-2022-10-10-29**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government Street
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 24-OCT-2022 10:40



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: Wrights Creek Upstream of CR179

Collection Date/Time: 10/10/2022 10:45

Field ID: G3NW0228

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2362093	EPA 200.7 Rev. 4.4	Calcium	43.0		mg/L	P420837	
		Iron	200		ug/L	P420837	
		Magnesium	1.40		mg/L	P420837	
		Potassium	0.34	I	mg/L	P420837	
		Sodium	1.9	I	mg/L	P420837	
		Strontium	28.2		ug/L	P420837	
		Tin	3.0	U	ug/L	P420837	
		Titanium	1.2	I	ug/L	P420837	
		Vanadium	2.0	U	ug/L	P420837	
		Zinc	5.0	U	ug/L	P420837	
	EPA 200.8 Rev. 5.4	Aluminum	92		ug/L	P420837	
		Antimony	0.050	U	ug/L	P420837	
		Arsenic	0.27		ug/L	P420837	
		Barium	9.72		ug/L	P420837	
		Beryllium	0.012	I	ug/L	P420837	
		Boron	7.3	I	ug/L	P420837	
		Cadmium	0.020	U	ug/L	P420837	
		Chromium	0.58	I	ug/L	P420837	
		Cobalt	0.078	I	ug/L	P420837	
		Copper	0.40	U	ug/L	P420837	
		Lead	0.20	U	ug/L	P420837	
		Manganese	48.9		ug/L	P420837	
		Molybdenum	0.15	U	ug/L	P420837	
		Nickel	0.50	U	ug/L	P420837	
		Selenium	0.20	U	ug/L	P420837	
		Silver	0.010	U	ug/L	P420837	
		Thallium	0.10	U	ug/L	P420837	
	SM 2340 B-2011	Hardness	113		mg/L	P420837	

Sample Location: Wrights Creek upstream of HWY 2

Collection Date/Time: 10/10/2022 12:15

Field ID: G3NW0236

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2362094	EPA 200.7 Rev. 4.4	Calcium	26.7		mg/L	P420837	
		Iron	200		ug/L	P420837	
		Magnesium	1.33		mg/L	P420837	
		Potassium	0.50	I	mg/L	P420837	
		Sodium	1.9	I	mg/L	P420837	
		Strontium	16.7		ug/L	P420837	
		Tin	3.0	U	ug/L	P420837	
		Titanium	0.79	I	ug/L	P420837	
		Vanadium	2.0	U	ug/L	P420837	
		Zinc	5.0	U	ug/L	P420837	
	EPA 200.8 Rev. 5.4	Aluminum	25		ug/L	P420837	
		Antimony	0.050	U	ug/L	P420837	
		Arsenic	0.26		ug/L	P420837	
		Barium	11.2		ug/L	P420837	
		Beryllium	0.010	U	ug/L	P420837	
		Boron	10		ug/L	P420837	
		Cadmium	0.020	U	ug/L	P420837	
		Chromium	0.65	I	ug/L	P420837	
		Cobalt	0.038	I	ug/L	P420837	
		Copper	0.40	U	ug/L	P420837	
		Lead	0.20	U	ug/L	P420837	
		Manganese	29.0		ug/L	P420837	
		Molybdenum	0.15	U	ug/L	P420837	
		Nickel	0.50	U	ug/L	P420837	
		Selenium	0.20	U	ug/L	P420837	
		Silver	0.010	U	ug/L	P420837	
		Thallium	0.10	U	ug/L	P420837	
	SM 2340 B-2011	Hardness	72.1		mg/L	P420837	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P420837

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: P420837

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: P420837

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	104		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	103		P	85 - 115
Sodium	106		P	85 - 115
Strontium	104		P	85 - 115
Tin	102		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	102		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420837

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.3		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	101		P	85 - 115
Barium	105		P	85 - 115
Beryllium	92.2		P	85 - 115
Boron	102		P	85 - 115
Cadmium	99.1		P	85 - 115
Chromium	102		P	85 - 115
Cobalt	101		P	85 - 115
Copper	100		P	85 - 115
Lead	94.7		P	85 - 115
Manganese	103		P	85 - 115
Molybdenum	99.0		P	85 - 115
Nickel	101		P	85 - 115
Selenium	100		P	85 - 115
Silver	101		P	85 - 115
Thallium	100		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P420837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361766	Calcium	111		P	80 - 120
2361766	Iron	109		P	80 - 120
2361766	Magnesium	109		P	80 - 120
2361766	Potassium	105		P	80 - 120
2361766	Sodium	103		P	80 - 120
2361766	Strontium	107		P	80 - 120
2361766	Tin	106		P	80 - 120
2361766	Titanium	107		P	80 - 120
2361766	Vanadium	105		P	80 - 120
2361766	Zinc	106		P	80 - 120
2361889	Calcium	105	106	P/P	80 - 120
2361889	Iron	103	104	P/P	80 - 120
2361889	Magnesium	106	107	P/P	80 - 120
2361889	Potassium	102	103	P/P	80 - 120
2361889	Sodium	101	102	P/P	80 - 120
2361889	Strontium	103	104	P/P	80 - 120
2361889	Tin	105	101	P/P	80 - 120
2361889	Titanium	101	99.6	P/P	80 - 120
2361889	Vanadium	102	102	P/P	80 - 120
2361889	Zinc	103	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P420837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361766	Aluminum	98.9		P	80 - 120
2361766	Antimony	103		P	80 - 120
2361766	Arsenic	102		P	80 - 120
2361766	Barium	105		P	80 - 120
2361766	Beryllium	93.1		P	80 - 120
2361766	Boron	104		P	80 - 120
2361766	Cadmium	102		P	80 - 120
2361766	Chromium	103		P	80 - 120
2361766	Cobalt	102		P	80 - 120
2361766	Copper	101		P	80 - 120
2361766	Lead	96.1		P	80 - 120
2361766	Manganese	104		P	80 - 120
2361766	Molybdenum	99.9		P	80 - 120
2361766	Nickel	102		P	80 - 120
2361766	Selenium	102		P	80 - 120
2361766	Silver	101		P	80 - 120
2361766	Thallium	102		P	80 - 120
2361889	Aluminum	99.4	98.0	P/P	80 - 120
2361889	Antimony	101	100	P/P	80 - 120
2361889	Arsenic	102	101	P/P	80 - 120
2361889	Barium	105	104	P/P	80 - 120
2361889	Beryllium	87.6	89.7	P/P	80 - 120
2361889	Boron	106	105	P/P	80 - 120
2361889	Cadmium	99.3	100	P/P	80 - 120
2361889	Chromium	102	101	P/P	80 - 120
2361889	Cobalt	100	99.6	P/P	80 - 120
2361889	Copper	101	101	P/P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2361889	Lead	95.8	95.6	P/P	80 - 120
2361889	Manganese	100	99.6	P/P	80 - 120
2361889	Molybdenum	98.8	98.6	P/P	80 - 120
2361889	Nickel	101	99.5	P/P	80 - 120
2361889	Selenium	99.1	99.4	P/P	80 - 120
2361889	Silver	100	99.8	P/P	80 - 120
2361889	Thallium	101	101	P/P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P420837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361889	Calcium	0.738	Spike	P	0 - 20
2361889	Iron	0.370	Spike	P	0 - 20
2361889	Magnesium	0.671	Spike	P	0 - 20
2361889	Potassium	0.204	Spike	P	0 - 20
2361889	Sodium	0.632	Spike	P	0 - 20
2361889	Strontium	0.632	Spike	P	0 - 20
2361889	Tin	3.71	Spike	P	0 - 20
2361889	Titanium	1.04	Spike	P	0 - 20
2361889	Vanadium	0.680	Spike	P	0 - 20
2361889	Zinc	0.778	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P420837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2361889	Aluminum	1.39	Spike	P	0 - 20
2361889	Antimony	1.07	Spike	P	0 - 20
2361889	Arsenic	0.774	Spike	P	0 - 20
2361889	Barium	1.03	Spike	P	0 - 20
2361889	Beryllium	2.07	Spike	P	0 - 20
2361889	Boron	0.862	Spike	P	0 - 20
2361889	Cadmium	0.943	Spike	P	0 - 20
2361889	Chromium	1.28	Spike	P	0 - 20
2361889	Cobalt	0.761	Spike	P	0 - 20
2361889	Copper	0.125	Spike	P	0 - 20
2361889	Lead	0.195	Spike	P	0 - 20
2361889	Manganese	0.346	Spike	P	0 - 20
2361889	Molybdenum	0.172	Spike	P	0 - 20
2361889	Nickel	1.52	Spike	P	0 - 20
2361889	Selenium	0.248	Spike	P	0 - 20
2361889	Silver	0.598	Spike	P	0 - 20
2361889	Thallium	0.495	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: A115327

Included Lab Sample IDs: 2362093, 2362094

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	101	P/P	90 - 110
Calcium	103	102	P/P	90 - 110
Iron	102	101	P/P	90 - 110
Iron	103	102	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Potassium	100	99.9	P/P	90 - 110
Potassium	101	100	P/P	90 - 110
Sodium	102	101	P/P	90 - 110
Sodium	103	102	P/P	90 - 110
Strontium	105	105	P/P	90 - 110
Strontium	105	104	P/P	90 - 110
Tin	100	102	P/P	90 - 110
Tin	103	100	P/P	90 - 110
Titanium	102	102	P/P	90 - 110
Titanium	103	102	P/P	90 - 110
Vanadium	100	101	P/P	90 - 110
Vanadium	102	100	P/P	90 - 110
Zinc	100	102	P/P	90 - 110
Zinc	102	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A115352

Included Lab Sample IDs: 2362093, 2362094

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	100	P/P	90 - 110
Antimony	100	98.0	P/P	90 - 110
Arsenic	101	98.9	P/P	90 - 110
Barium	101	98.7	P/P	90 - 110
Beryllium	97.1	93.1	P/P	90 - 110
Boron	99.8	104	P/P	90 - 110
Cadmium	100	99.8	P/P	90 - 110
Chromium	99.7	98.8	P/P	90 - 110
Cobalt	99.3	96.5	P/P	90 - 110
Copper	98.5	95.1	P/P	90 - 110
Lead	93.7	93.2	P/P	90 - 110
Manganese	101	99.8	P/P	90 - 110
Molybdenum	99.8	98.5	P/P	90 - 110
Nickel	99.6	96.8	P/P	90 - 110
Selenium	101	99.5	P/P	90 - 110
Silver	98.8	97.5	P/P	90 - 110
Thallium	99.1	97.9	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	106	111	105	106			0.738
	Iron	104	109	103	104			0.370
	Magnesium	106	109	106	107			0.671
	Potassium	103	105	102	103			0.204
	Sodium	106	103	101	102			0.632
	Strontium	104	107	103	104			0.632
	Tin	102	106	105	101			3.71
	Titanium	103	107	101	99.6			1.04
	Vanadium	102	105	102	102			0.680
	Zinc	102	106	103	102			0.778
EPA 200.8 Rev. 5.4	Aluminum	98.3	99.4	98.0	98.9			1.39
	Antimony	103	101	100	103			1.07
	Arsenic	101	102	101	102			0.774
	Barium	105	105	104	105			1.03
	Beryllium	92.2	87.6	89.7	93.1			2.07
	Boron	102	106	105	104			0.862
	Cadmium	99.1	99.3	100	102			0.943
	Chromium	102	102	101	103			1.28
	Cobalt	101	100	99.6	102			0.761
	Copper	100	101	101	101			0.125
	Lead	94.7	95.8	95.6	96.1			0.195
	Manganese	103	100	99.6	104			0.346
	Molybdenum	99.0	98.8	98.6	99.9			0.172
	Nickel	101	101	99.5	102			1.52
	Selenium	100	99.1	99.4	102			0.248
	Silver	101	100	99.8	101			0.598
	Thallium	100	101	101	102			0.495

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	2362093, 2362094
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2362093, 2362094
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2362093, 2362094

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	10/12/2022	10/13/2022 11:20	George D Taylor	10/14/2022 22:21	McKinley C Carter	2362093
	10/12/2022	10/13/2022 11:20	George D Taylor	10/14/2022 22:56	McKinley C Carter	2362094
EPA 200.8 Rev. 5.4	10/12/2022	10/13/2022 11:20	George D Taylor	10/17/2022 18:25	Megan Whitefoot	2362093
	10/12/2022	10/13/2022 11:20	George D Taylor	10/17/2022 18:34	Megan Whitefoot	2362094
SM 2340 B-2011	10/12/2022			10/14/2022 22:21	McKinley C Carter	2362093
	10/12/2022			10/14/2022 22:56	McKinley C Carter	2362094