

Chemical Analysis Report

NW-DIST-2023-02-03-01

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

Event Description: **Milton North Run**
Request ID: **RQ-2023-01-30-16**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government Street
Suite 208
Pensacola, FL 32502-5794
Attn: Myranda Butler

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
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: 17-FEB-2023 10:19

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: Bucket Branch downstream of Pat Brown Road Collection Date/Time: 01/31/2023 11:00

Field ID: G4NW0532

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2384916	EPA 200.7 Rev. 4.4	Calcium	1.85		mg/L	P425440	
		Chromium	1.0	U	ug/L	P425440	
		Iron	610		ug/L	P425440	
		Magnesium	1.11		mg/L	P425440	
		Potassium	0.40	I	mg/L	P425440	
		Sodium	2.4		mg/L	P425440	
		Strontium	9.0		ug/L	P425440	
		Tin	3.0	U	ug/L	P425440	
		Titanium	2.0	I	ug/L	P425440	
		Vanadium	2.0	U	ug/L	P425440	
		Zinc	5.0	U	ug/L	P425440	
	EPA 200.8 Rev. 5.4	Aluminum	355		ug/L	P425440	
		Antimony	0.050	U	ug/L	P425440	
		Arsenic	0.35		ug/L	P425440	
		Barium	23.7		ug/L	P425440	
		Beryllium	0.029	I	ug/L	P425440	
		Boron	10.8		ug/L	P425440	
		Cadmium	0.020	U	ug/L	P425440	
		Cobalt	0.312		ug/L	P425440	
		Copper	0.61	I	ug/L	P425440	
		Lead	0.25	I	ug/L	P425440	
		Manganese	46.1		ug/L	P425440	
		Molybdenum	0.15	U	ug/L	P425440	
		Nickel	0.50	U	ug/L	P425440	
		Selenium	0.20	U	ug/L	P425440	
		Silver	0.010	U	ug/L	P425440	
		Thallium	0.10	U	ug/L	P425440	
	SM 2340 B-2011	Hardness	9.2		mg/L	P425440	

Sample Location: Pace Mill Creek upstream of Hwy 90

Collection Date/Time: 01/31/2023 11:40

Field ID: G4NW0481

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2384917	EPA 200.7 Rev. 4.4	Calcium	2.90		mg/L	P425440	
		Chromium	1.0	U	ug/L	P425440	
		Iron	570		ug/L	P425440	
		Magnesium	1.10		mg/L	P425440	
		Potassium	0.87	I	mg/L	P425440	
		Sodium	4.3		mg/L	P425440	
		Strontium	12.8		ug/L	P425440	
		Tin	3.0	U	ug/L	P425440	
		Titanium	1.9	I	ug/L	P425440	
		Vanadium	2.0	U	ug/L	P425440	
		Zinc	5.0	U	ug/L	P425440	
	EPA 200.8 Rev. 5.4	Aluminum	264		ug/L	P425440	
		Antimony	0.085	I	ug/L	P425440	
		Arsenic	0.34		ug/L	P425440	
		Barium	17.2		ug/L	P425440	
		Beryllium	0.014	I	ug/L	P425440	
		Boron	17.3		ug/L	P425440	
		Cadmium	0.020	U	ug/L	P425440	
		Cobalt	0.130		ug/L	P425440	
		Copper	0.54	I	ug/L	P425440	
		Lead	0.24	I	ug/L	P425440	
		Manganese	21.3		ug/L	P425440	
		Molybdenum	0.15	U	ug/L	P425440	
		Nickel	0.50	U	ug/L	P425440	
		Selenium	0.20	U	ug/L	P425440	
		Silver	0.010	U	ug/L	P425440	
		Thallium	0.10	U	ug/L	P425440	
	SM 2340 B-2011	Hardness	11.8		mg/L	P425440	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P425440

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/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: P425440

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
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: P425440

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Chromium	99.2		P	85 - 115
Iron	103		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	104		P	85 - 115
Sodium	104		P	85 - 115
Strontium	104		P	85 - 115
Tin	99.8		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	99.8		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425440

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.0		P	85 - 115
Antimony	95.2		P	85 - 115
Arsenic	100		P	85 - 115
Barium	102		P	85 - 115
Beryllium	96.5		P	85 - 115
Boron	98.4		P	85 - 115
Cadmium	98.2		P	85 - 115
Cobalt	98.0		P	85 - 115
Copper	99.6		P	85 - 115
Lead	92.0		P	85 - 115
Manganese	100		P	85 - 115
Molybdenum	94.1		P	85 - 115
Nickel	100		P	85 - 115
Selenium	97.5		P	85 - 115
Silver	96.2		P	85 - 115
Thallium	94.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P425440

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384724	Calcium	102		P	80 - 120
2384724	Chromium	99.5	99.1	P/P	80 - 120
2384724	Iron	104	105	P/P	80 - 120
2384724	Magnesium	103	103	P/P	80 - 120
2384724	Potassium	101	100	P/P	80 - 120
2384724	Sodium	104		P	80 - 120
2384724	Strontium	103	102	P/P	80 - 120
2384724	Tin	102	104	P/P	80 - 120
2384724	Titanium	102	102	P/P	80 - 120
2384724	Vanadium	101	101	P/P	80 - 120
2384724	Zinc	102	103	P/P	80 - 120
2384727	Calcium	103		P	80 - 120
2384727	Chromium	99.4		P	80 - 120
2384727	Iron	104		P	80 - 120
2384727	Magnesium	104		P	80 - 120
2384727	Potassium	101		P	80 - 120
2384727	Sodium	106		P	80 - 120
2384727	Strontium	101		P	80 - 120
2384727	Tin	101		P	80 - 120
2384727	Titanium	101		P	80 - 120
2384727	Vanadium	100		P	80 - 120
2384727	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P425440

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384724	Aluminum	96.6	97.9	P/P	80 - 120
2384724	Antimony	97.6	98.0	P/P	80 - 120
2384724	Arsenic	101	103	P/P	80 - 120
2384724	Barium	103	104	P/P	80 - 120
2384724	Beryllium	94.8	98.9	P/P	80 - 120
2384724	Boron	97.1	97.6	P/P	80 - 120
2384724	Cadmium	101	102	P/P	80 - 120
2384724	Cobalt	97.7	98.4	P/P	80 - 120
2384724	Copper	102	102	P/P	80 - 120
2384724	Lead	93.0	94.4	P/P	80 - 120
2384724	Manganese	101	102	P/P	80 - 120
2384724	Molybdenum	96.5	97.8	P/P	80 - 120
2384724	Nickel	102	102	P/P	80 - 120
2384724	Selenium	96.1	97.2	P/P	80 - 120
2384724	Silver	95.8	96.2	P/P	80 - 120
2384724	Thallium	96.3	98.3	P/P	80 - 120
2384727	Aluminum	97.4		P	80 - 120
2384727	Antimony	95.7		P	80 - 120
2384727	Arsenic	99.4		P	80 - 120
2384727	Barium	103		P	80 - 120
2384727	Beryllium	97.4		P	80 - 120
2384727	Boron	96.9		P	80 - 120
2384727	Cadmium	100		P	80 - 120
2384727	Cobalt	96.8		P	80 - 120
2384727	Copper	99.9		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425440

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384727	Lead	93.0		P	80 - 120
2384727	Manganese	101		P	80 - 120
2384727	Molybdenum	94.5		P	80 - 120
2384727	Nickel	102		P	80 - 120
2384727	Selenium	97.0		P	80 - 120
2384727	Silver	95.1		P	80 - 120
2384727	Thallium	96.6		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P425440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384724	Calcium	0.227	Spike	P	0 - 20
2384724	Chromium	0.476	Spike	P	0 - 20
2384724	Iron	0.752	Spike	P	0 - 20
2384724	Magnesium	0.486	Spike	P	0 - 20
2384724	Potassium	0.813	Spike	P	0 - 20
2384724	Sodium	1.26	Spike	P	0 - 20
2384724	Strontium	0.514	Spike	P	0 - 20
2384724	Tin	1.77	Spike	P	0 - 20
2384724	Titanium	0.263	Spike	P	0 - 20
2384724	Vanadium	0.259	Spike	P	0 - 20
2384724	Zinc	0.791	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P425440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384724	Aluminum	1.30	Spike	P	0 - 20
2384724	Antimony	0.445	Spike	P	0 - 20
2384724	Arsenic	1.27	Spike	P	0 - 20
2384724	Barium	1.03	Spike	P	0 - 20
2384724	Beryllium	4.14	Spike	P	0 - 20
2384724	Boron	0.483	Spike	P	0 - 20
2384724	Cadmium	0.687	Spike	P	0 - 20
2384724	Cobalt	0.652	Spike	P	0 - 20
2384724	Copper	0.267	Spike	P	0 - 20
2384724	Lead	1.52	Spike	P	0 - 20
2384724	Manganese	0.152	Spike	P	0 - 20
2384724	Molybdenum	1.38	Spike	P	0 - 20
2384724	Nickel	0.203	Spike	P	0 - 20
2384724	Selenium	1.16	Spike	P	0 - 20
2384724	Silver	0.456	Spike	P	0 - 20
2384724	Thallium	2.03	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: A117342

Included Lab Sample IDs: 2384916, 2384917

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.1	97.2	P/P	90 - 110
Aluminum	99.9	97.3	P/P	90 - 110
Antimony	94.9	95.0	P/P	90 - 110
Antimony	95.9	95.7	P/P	90 - 110
Arsenic	100	101	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Barium	100	99.4	P/P	90 - 110
Barium	101	100	P/P	90 - 110
Beryllium	101	101	P/P	90 - 110
Beryllium	102	102	P/P	90 - 110
Boron	101	94.0	P/P	90 - 110
Boron	94.2	93.0	P/P	90 - 110
Cadmium	98.7	98.5	P/P	90 - 110
Cadmium	99.2	98.7	P/P	90 - 110
Cobalt	95.5	95.7	P/P	90 - 110
Cobalt	96.8	96.2	P/P	90 - 110
Copper	99.4	99.0	P/P	90 - 110
Copper	99.4	99.3	P/P	90 - 110
Lead	95.8	95.9	P/P	90 - 110
Lead	96.3	95.7	P/P	90 - 110
Manganese	101	101	P/P	90 - 110
Manganese	99.9	100	P/P	90 - 110
Molybdenum	93.4	94.2	P/P	90 - 110
Molybdenum	94.0	94.2	P/P	90 - 110
Nickel	100	99.2	P/P	90 - 110
Nickel	98.7	98.4	P/P	90 - 110
Selenium	98.8	98.3	P/P	90 - 110
Selenium	99.5	97.8	P/P	90 - 110
Thallium	95.9	96.0	P/P	90 - 110
Thallium	96.5	96.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A117366

Included Lab Sample IDs: 2384916, 2384917

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	93.3	93.9	P/P	90 - 110
Silver	94.5	94.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A117439

Included Lab Sample IDs: 2384916, 2384917

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	105	102	P/P	90 - 110
Chromium	102	102	P/P	90 - 110
Iron	105	105	P/P	90 - 110
Magnesium	104	103	P/P	90 - 110
Potassium	104	105	P/P	90 - 110
Sodium	108	105	P/P	90 - 110
Strontium	104	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A117439

Included Lab Sample IDs: 2384916, 2384917

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Tin	101	101	P/P	90 - 110
Titanium	101	102	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	104	104	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	100	102	103				0.227
	Chromium	99.2	99.4	99.5	99.1			0.476
	Iron	103	104	105	104			0.752
	Magnesium	103	103	103	104			0.486
	Potassium	104	101	100	101			0.813
	Sodium	104	104	106				1.26
	Strontium	104	103	102	101			0.514
	Tin	99.8	102	104	101			1.77
	Titanium	101	102	102	101			0.263
	Vanadium	99.8	101	101	100			0.259
	Zinc	100	102	103	102			0.791
EPA 200.8 Rev. 5.4	Aluminum	99.0	96.6	97.9	97.4			1.30
	Antimony	95.2	97.6	98.0	95.7			0.445
	Arsenic	100	101	103	99.4			1.27
	Barium	102	103	104	103			1.03
	Beryllium	96.5	94.8	98.9	97.4			4.14
	Boron	98.4	97.1	97.6	96.9			0.483
	Cadmium	98.2	101	102	100			0.687
	Cobalt	98.0	97.7	98.4	96.8			0.652
	Copper	99.6	102	102	99.9			0.267
	Lead	92.0	93.0	94.4	93.0			1.52
	Manganese	100	101	102	101			0.152
	Molybdenum	94.1	96.5	97.8	94.5			1.38
	Nickel	100	102	102	102			0.203
	Selenium	97.5	96.1	97.2	97.0			1.16
	Silver	96.2	95.8	96.2	95.1			0.456
	Thallium	94.4	96.3	98.3	96.6			2.03

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	2384916, 2384917
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2384916, 2384917
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2384916, 2384917

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	02/03/2023	02/07/2023 11:45	George D Taylor	02/14/2023 16:35	McKinley C Carter	2384916
	02/03/2023	02/07/2023 11:45	George D Taylor	02/14/2023 16:41	McKinley C Carter	2384917
EPA 200.8 Rev. 5.4	02/03/2023	02/07/2023 11:45	George D Taylor	02/08/2023 20:20	Emily M Philpot	2384917
	02/03/2023	02/07/2023 11:45	George D Taylor	02/09/2023 00:50	Emily M Philpot	2384916
	02/03/2023	02/07/2023 11:45	George D Taylor	02/09/2023 15:06	Emily M Philpot	2384916
	02/03/2023	02/07/2023 11:45	George D Taylor	02/09/2023 16:45	Emily M Philpot	2384917
	02/03/2023	02/07/2023 11:45	George D Taylor	02/09/2023 16:35	McKinley C Carter	2384916
SM 2340 B-2011	02/03/2023			02/14/2023 16:41	McKinley C Carter	2384917