Chemical Analysis Report

NE-DIST-2019-06-27-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Alachua County March SMP**
Request ID: **RQ-2019-06-24-11**
Customer: **NE-DIST**
Project ID: **SMP**

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8800 Baymeadows Way West
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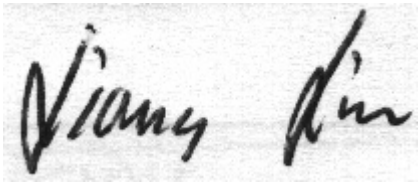
Date Certified: 11-JUL-2019 16:17



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: Bivens Arm Lake - West of US 441 and South of SW 16th Street **Collection Date/Time: 06/26/2019 09:40**

Field ID: BIV441 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2099019	EPA 200.7 Rev. 4.4	Barium	9.9		ug/L	P366570	
		Calcium	29.1		mg/L	P366570	
		Iron	67	I	ug/L	P366570	
		Magnesium	2.48		mg/L	P366570	
		Potassium	2.1		mg/L	P366570	
		Sodium	5.9		mg/L	P366570	
		Zinc	5.0	U	ug/L	P366570	
	EPA 200.8 Rev. 5.4	Aluminum	253		ug/L	P366570	
		Antimony	0.28		ug/L	P366570	
		Arsenic	1.18		ug/L	P366570	
		Boron**	25.0		ug/L	P366570	
		Cadmium	0.020	U	ug/L	P366570	
		Chromium	0.48	I	ug/L	P366570	
		Copper	0.62	I	ug/L	P366570	
		Lead	1.12		ug/L	P366570	
		Nickel	0.50	U	ug/L	P366570	
		Selenium	0.20	U	ug/L	P366570	
		Silver	0.010	U	ug/L	P366570	
		Thallium	0.10	U	ug/L	P366570	

Sample Location: Tumblin Creek - W of US 441 **Collection Date/Time: 06/26/2019 10:10**

Field ID: Tum441 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2099020	EPA 200.7 Rev. 4.4	Barium	21.4		ug/L	P366570	
		Calcium	56.1		mg/L	P366570	
		Iron	130		ug/L	P366570	
		Magnesium	8.42		mg/L	P366570	
		Potassium	3.1		mg/L	P366570	
		Sodium	14.3		mg/L	P366570	
		Zinc	5.0	U	ug/L	P366570	
	EPA 200.8 Rev. 5.4	Aluminum	63		ug/L	P366570	
		Antimony	0.39		ug/L	P366570	
		Arsenic	1.03		ug/L	P366570	
		Boron**	54.4		ug/L	P366570	
		Cadmium	0.020	U	ug/L	P366570	
		Chromium	0.40	U	ug/L	P366570	
		Copper	1.00		ug/L	P366570	
		Lead	0.56		ug/L	P366570	
		Nickel	0.50	U	ug/L	P366570	
		Selenium	0.41	I	ug/L	P366570	
		Silver	0.010	U	ug/L	P366570	
		Thallium	0.10	U	ug/L	P366570	

Sample Location: Tumblin Creek - S of SW 5th Ave. **Collection Date/Time: 06/26/2019 10:30**

Field ID: TUMSW5 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2099021	EPA 200.7 Rev. 4.4	Barium	24.5		ug/L	P366570	
		Calcium	53.5		mg/L	P366570	
		Iron	120	I	ug/L	P366570	
		Magnesium	7.81		mg/L	P366570	
		Potassium	3.3		mg/L	P366570	
		Sodium	14.4		mg/L	P366570	
		Zinc	5.0	U	ug/L	P366570	
	EPA 200.8 Rev. 5.4	Aluminum	38		ug/L	P366570	
		Antimony	0.35		ug/L	P366570	
		Arsenic	0.80		ug/L	P366570	
		Boron**	55.4		ug/L	P366570	
		Cadmium	0.020	U	ug/L	P366570	
		Chromium	0.40	U	ug/L	P366570	
		Copper	0.69	I	ug/L	P366570	
		Lead	0.22	I	ug/L	P366570	
		Nickel	0.50	U	ug/L	P366570	
		Selenium	0.54	I	ug/L	P366570	
		Silver	0.010	U	ug/L	P366570	
		Thallium	0.10	U	ug/L	P366570	

Sample Location: Sweetwater Branch - N of 4th St **Collection Date/Time: 06/26/2019 11:00**

Field ID: SWBSE4 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2099022	EPA 200.7 Rev. 4.4	Barium	30.2		ug/L	P366570	
		Calcium	73.7		mg/L	P366570	
		Iron	150		ug/L	P366570	
		Magnesium	13.2		mg/L	P366570	
		Potassium	2.0		mg/L	P366570	
		Sodium	18.6		mg/L	P366570	
		Zinc	5.1	I	ug/L	P366570	
	EPA 200.8 Rev. 5.4	Aluminum	53		ug/L	P366570	
		Antimony	1.02		ug/L	P366570	
		Arsenic	1.28		ug/L	P366570	
		Boron**	55.3		ug/L	P366570	
		Cadmium	0.034	I	ug/L	P366570	
		Chromium	0.93	I	ug/L	P366570	
		Copper	3.94		ug/L	P366570	
		Lead	0.42		ug/L	P366570	
		Nickel	1.1	I	ug/L	P366570	
		Selenium	0.29	I	ug/L	P366570	
		Silver	0.010	U	ug/L	P366570	
		Thallium	0.10	U	ug/L	P366570	

Sample Location: Sweetwater branch - N of 4th St - Duplicate **Collection Date/Time: 06/26/2019 11:00**

Field ID: SWBSE4 - Duplicate Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2099023	EPA 200.7 Rev. 4.4	Barium	29.5		ug/L	P366570	
		Calcium	73.6		mg/L	P366570	
		Iron	140		ug/L	P366570	
		Magnesium	13.1		mg/L	P366570	
		Potassium	2.1		mg/L	P366570	
		Sodium	18.5		mg/L	P366570	
		Zinc	5.7	I	ug/L	P366570	
	EPA 200.8 Rev. 5.4	Aluminum	49		ug/L	P366570	
		Antimony	1.0		ug/L	P366570	
		Arsenic	1.23		ug/L	P366570	
		Boron**	55.2		ug/L	P366570	
		Cadmium	0.031	I	ug/L	P366570	
		Chromium	0.89	I	ug/L	P366570	
		Copper	3.88		ug/L	P366570	
		Lead	0.40		ug/L	P366570	
		Nickel	1.1	I	ug/L	P366570	
		Selenium	0.31	I	ug/L	P366570	
		Silver	0.010	U	ug/L	P366570	
		Thallium	0.10	U	ug/L	P366570	

Sample Location: Sweet water branch Upstream of SR 331 **Collection Date/Time: 06/26/2019 11:20**

Field ID: SWB331 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2099024	EPA 200.7 Rev. 4.4	Barium	13.6		ug/L	P366570	
		Calcium	54.1		mg/L	P366570	
		Iron	75	I	ug/L	P366570	
		Magnesium	17.7		mg/L	P366570	
		Potassium	6.6		mg/L	P366570	
		Sodium	51.7		mg/L	P366570	
		Zinc	14	I	ug/L	P366570	
	EPA 200.8 Rev. 5.4	Aluminum	89		ug/L	P366570	
		Antimony	0.43		ug/L	P366570	
		Arsenic	0.92		ug/L	P366570	
		Boron**	96.0		ug/L	P366570	
		Cadmium	0.020	U	ug/L	P366570	
		Chromium	0.47	I	ug/L	P366570	
		Copper	0.92		ug/L	P366570	
		Lead	0.31	I	ug/L	P366570	
		Nickel	0.80	I	ug/L	P366570	
		Selenium	0.20	U	ug/L	P366570	
		Silver	0.010	U	ug/L	P366570	
		Thallium	0.10	U	ug/L	P366570	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P366570

Component	Result	Code	Units
Barium	1.0	U	ug/L
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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P366570

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	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: P366570

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	101		P	85 - 115
Iron	103		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	105		P	85 - 115
Sodium	101		P	85 - 115
Zinc	98.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P366570

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	98.6		P	85 - 115
Arsenic	104		P	85 - 115
Boron	104		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	102		P	85 - 115
Copper	100		P	85 - 115
Lead	96.7		P	85 - 115
Nickel	102		P	85 - 115
Selenium	104		P	85 - 115
Silver	98.6		P	85 - 115
Thallium	100		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P366570

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2099021	Barium	99.2	98.9	P/P	80 - 120
2099021	Calcium	101		P	80 - 120
2099021	Iron	103	103	P/P	80 - 120
2099021	Magnesium	102		P	80 - 120
2099021	Potassium	100	99.8	P/P	80 - 120
2099021	Sodium	100		P	80 - 120
2099021	Zinc	99.0	98.6	P/P	80 - 120
2099431	Barium	97.5		P	80 - 120
2099431	Calcium	99.9		P	80 - 120
2099431	Iron	104		P	80 - 120
2099431	Magnesium	103		P	80 - 120
2099431	Potassium	104		P	80 - 120
2099431	Sodium	102		P	80 - 120
2099431	Zinc	98.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P366570

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2099021	Aluminum	101	101	P/P	80 - 120
2099021	Antimony	99.0	100	P/P	80 - 120
2099021	Arsenic	104	104	P/P	80 - 120
2099021	Boron	105	106	P/P	80 - 120
2099021	Cadmium	101	102	P/P	80 - 120
2099021	Chromium	101	102	P/P	80 - 120
2099021	Copper	97.0	95.9	P/P	80 - 120
2099021	Lead	97.5	97.3	P/P	80 - 120
2099021	Nickel	98.7	97.8	P/P	80 - 120
2099021	Selenium	101	101	P/P	80 - 120
2099021	Silver	97.1	97.3	P/P	80 - 120
2099021	Thallium	102	103	P/P	80 - 120
2099431	Aluminum	99.9		P	80 - 120
2099431	Antimony	99.7		P	80 - 120
2099431	Arsenic	104		P	80 - 120
2099431	Boron	103		P	80 - 120
2099431	Cadmium	100		P	80 - 120
2099431	Chromium	101		P	80 - 120
2099431	Copper	95.1		P	80 - 120
2099431	Lead	98.5		P	80 - 120
2099431	Nickel	101		P	80 - 120
2099431	Selenium	99.2		P	80 - 120
2099431	Silver	95.9		P	80 - 120
2099431	Thallium	102		P	80 - 120

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P366570

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2099021	Barium	0.348	Spike	P	0 - 20
2099021	Calcium	0.429	Spike	P	0 - 20
2099021	Iron	0.360	Spike	P	0 - 20
2099021	Magnesium	0.0429	Spike	P	0 - 20
2099021	Potassium	0.250	Spike	P	0 - 20
2099021	Sodium	0.303	Spike	P	0 - 20
2099021	Zinc	0.423	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P366570

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2099021	Aluminum	0.231	Spike	P	0 - 20
2099021	Antimony	1.01	Spike	P	0 - 20
2099021	Arsenic	0.00850	Spike	P	0 - 20
2099021	Boron	0.129	Spike	P	0 - 20
2099021	Cadmium	0.775	Spike	P	0 - 20
2099021	Chromium	0.477	Spike	P	0 - 20
2099021	Copper	1.09	Spike	P	0 - 20
2099021	Lead	0.201	Spike	P	0 - 20
2099021	Nickel	0.897	Spike	P	0 - 20
2099021	Selenium	0.0783	Spike	P	0 - 20
2099021	Silver	0.250	Spike	P	0 - 20
2099021	Thallium	0.351	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A92516
Included Lab Sample IDs: 2099019, 2099020, 2099021, 2099022, 2099023, 2099024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	102	P/P	90 - 110
Calcium	101	102	P/P	90 - 110
Iron	100	101	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	99.3	101	P/P	90 - 110
Sodium	101	103	P/P	90 - 110
Zinc	100	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A92586
Included Lab Sample IDs: 2099019, 2099020, 2099021, 2099022, 2099023, 2099024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	100	P/P	90 - 110
Antimony	97.0	96.9	P/P	90 - 110
Arsenic	99.6	98.6	P/P	90 - 110
Boron	103	102	P/P	90 - 110
Cadmium	99.0	98.9	P/P	90 - 110
Chromium	99.9	101	P/P	90 - 110
Copper	98.3	97.7	P/P	90 - 110
Lead	96.3	95.5	P/P	90 - 110
Nickel	98.7	98.1	P/P	90 - 110
Selenium	102	101	P/P	90 - 110
Silver	94.4	93.5	P/P	90 - 110
Thallium	94.0	92.7	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	Barium	101	99.2	98.9	97.5			0.348
	Calcium	101	101	99.9				0.429
	Iron	103	103	103	104			0.360
	Magnesium	102	102	103				0.0429
	Potassium	105	100	99.8	104			0.250
	Sodium	101	100	102				0.303
	Zinc	98.5	99.0	98.6	98.9			0.423
EPA 200.8 Rev. 5.4	Aluminum	103	101	101	99.9			0.231
	Antimony	98.6	99.0	100	99.7			1.01
	Arsenic	104	104	104	104			0.0085
	Boron	104	105	106	103			0.129
	Cadmium	101	101	102	100			0.775
	Chromium	102	101	102	101			0.477
	Copper	100	97.0	95.9	95.1			1.09
	Lead	96.7	97.5	97.3	98.5			0.201
	Nickel	102	98.7	97.8	101			0.897
	Selenium	104	101	101	99.2			0.0783
	Silver	98.6	97.1	97.3	95.9			0.250
	Thallium	100	102	103	102			0.351

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2099019, 2099020, 2099021, 2099022, 2099023, 2099024
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2099019, 2099020, 2099021, 2099022, 2099023, 2099024

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	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/02/2019 13:32	Betina Topolski	2099019
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/02/2019 13:37	Betina Topolski	2099020
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/02/2019 13:43	Betina Topolski	2099021
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/02/2019 14:08	Betina Topolski	2099022
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/02/2019 14:15	Betina Topolski	2099023
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/02/2019 14:23	Betina Topolski	2099024
EPA 200.8 Rev. 5.4	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/03/2019 18:10	Robert K Palmer	2099019
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/03/2019 18:20	Robert K Palmer	2099020
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/03/2019 18:29	Robert K Palmer	2099021
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/03/2019 19:07	Robert K Palmer	2099022
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/03/2019 19:17	Robert K Palmer	2099023
	06/27/2019	07/01/2019 14:35	Elliott D. Healy	07/03/2019 19:26	Robert K Palmer	2099024