

Chemical Analysis Report

CEN-DIST-2020-11-30-01

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

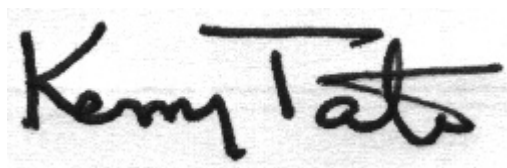
Event Description: **Withlacoochee River SCI**
Request ID: **RQ-2020-12-07-20**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Kalina Warren

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: 14-DEC-2020 08:43

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first few letters.

NON-CONFORMANCE REPORT INCLUDED

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: Horse Creek @ Croton Road Bridge

Collection Date/Time: 11/24/2020 11:16

Field ID: G5CE0078

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2209570	EPA 200.7 Rev. 4.4	Iron	120	I	ug/L	P390518	
		Manganese	5.8		ug/L	P390518	
		Zinc	5.0	U	ug/L	P390518	
	EPA 200.8 Rev. 5.4	Aluminum	107		ug/L	P390518	
		Antimony	0.11	I	ug/L	P390518	
		Arsenic	2.78		ug/L	P390518	
		Beryllium	0.010	U	ug/L	P390518	
		Cadmium	0.020	U	ug/L	P390518	
		Chromium	0.57	I	ug/L	P390518	
		Copper	1.56		ug/L	P390518	
		Lead	0.20	U	ug/L	P390518	
		Nickel	0.50	U	ug/L	P390518	
		Selenium	0.20	U	ug/L	P390518	
		Silver	0.010	U	ug/L	P390518	
		Thallium	0.10	U	ug/L	P390518	
	SM 2340B	Hardness	195		mg/L	P390518	

Non-Conformance Report

NCR ID: 8535

Event(s)

CEN-DIST-2020-11-30-01

Job(s)

Sample(s)

Test(s)

NCR Type: SHIPPING/RECEIVING

NCR Category: Samples arrived late

Observation: Samples arrived one or more days late by FedEx, samples received outside the acceptable temperature range.

Resolution: Expired / compromised samples not logged in as per SMP login protocol.

Samples will be qualified as appropriate.

Customer contacted, email correspondence attached to sample submittal forms.

Authorized by/Date: Joshua Ayres 12/3/2020

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390518

Component	Result	Code	Units
Iron	30	U	ug/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390518

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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: P390518

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	107		P	85 - 115
Manganese	105		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390518

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.4		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	101		P	85 - 115
Beryllium	94.0		P	85 - 115
Cadmium	98.6		P	85 - 115
Chromium	97.7		P	85 - 115
Copper	98.6		P	85 - 115
Lead	98.1		P	85 - 115
Nickel	98.1		P	85 - 115
Selenium	101		P	85 - 115
Silver	103		P	85 - 115
Thallium	99.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P390518

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209005	Iron	104		P	80 - 120
2209005	Manganese	101		P	80 - 120
2209005	Zinc	98.5		P	80 - 120
2209362	Iron	107	104	P/P	80 - 120
2209362	Manganese	102	102	P/P	80 - 120
2209362	Zinc	98.0	98.5	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P390518

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209005	Aluminum	100		P	80 - 120
2209005	Antimony	99.9		P	80 - 120
2209005	Arsenic	98.6		P	80 - 120
2209005	Beryllium	93.2		P	80 - 120
2209005	Cadmium	98.5		P	80 - 120
2209005	Chromium	101		P	80 - 120
2209005	Copper	100		P	80 - 120
2209005	Lead	99.3		P	80 - 120
2209005	Nickel	102		P	80 - 120
2209005	Selenium	94.3		P	80 - 120
2209005	Silver	101		P	80 - 120
2209005	Thallium	101		P	80 - 120
2209362	Aluminum	100	95.5	P/P	80 - 120
2209362	Antimony	99.9	100	P/P	80 - 120
2209362	Arsenic	101	100	P/P	80 - 120
2209362	Beryllium	96.2	104	P/P	80 - 120
2209362	Cadmium	99.1	99.7	P/P	80 - 120
2209362	Chromium	98.9	96.7	P/P	80 - 120
2209362	Copper	101	107	P/P	80 - 120
2209362	Lead	98.9	97.6	P/P	80 - 120
2209362	Nickel	101	99.0	P/P	80 - 120
2209362	Selenium	101	101	P/P	80 - 120
2209362	Silver	101	101	P/P	80 - 120
2209362	Thallium	101	99.5	P/P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390518

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209362	Iron	2.35	Spike	P	0 - 20
2209362	Manganese	0.00161	Spike	P	0 - 20
2209362	Zinc	0.505	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390518

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209362	Aluminum	4.52	Spike	P	0 - 20
2209362	Antimony	0.120	Spike	P	0 - 20
2209362	Arsenic	1.36	Spike	P	0 - 20
2209362	Beryllium	7.85	Spike	P	0 - 20
2209362	Cadmium	0.532	Spike	P	0 - 20
2209362	Chromium	2.26	Spike	P	0 - 20
2209362	Copper	5.09	Spike	P	0 - 20
2209362	Lead	1.27	Spike	P	0 - 20
2209362	Nickel	2.30	Spike	P	0 - 20
2209362	Selenium	0.0746	Spike	P	0 - 20
2209362	Silver	0.326	Spike	P	0 - 20
2209362	Thallium	1.27	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: A102357

Included Lab Sample IDs: 2209570

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	104	103	P/P	90 - 110
Manganese	102	102	P/P	90 - 110
Zinc	98.4	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102377

Included Lab Sample IDs: 2209570

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.0	97.7	P/P	90 - 110
Antimony	96.3	95.0	P/P	90 - 110
Arsenic	97.5	98.1	P/P	90 - 110
Beryllium	91.2	91.9	P/P	90 - 110
Cadmium	98.6	98.5	P/P	90 - 110
Chromium	96.4	96.4	P/P	90 - 110
Copper	95.7	95.9	P/P	90 - 110
Lead	98.8	97.7	P/P	90 - 110
Nickel	97.2	97.3	P/P	90 - 110
Selenium	97.5	98.0	P/P	90 - 110
Silver	98.8	98.7	P/P	90 - 110
Thallium	100	98.0	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 SMP	MS
			LCS				
EPA 200.7 Rev. 4.4	Iron	107	104	107	104		2.35
	Manganese	105	101	102	102		0.0016
	Zinc	102	98.5	98.0	98.5		0.505
EPA 200.8 Rev. 5.4	Aluminum	96.4	100	95.5	100		4.52
	Antimony	100	99.9	100	99.9		0.120
	Arsenic	101	101	100	98.6		1.36
	Beryllium	94.0	96.2	104	93.2		7.85
	Cadmium	98.6	99.1	99.7	98.5		0.532
	Chromium	97.7	98.9	96.7	101		2.26
	Copper	98.6	101	107	100		5.09
	Lead	98.1	98.9	97.6	99.3		1.27
	Nickel	98.1	101	99.0	102		2.30
	Selenium	101	101	101	94.3		0.0746
	Silver	103	101	101	101		0.326
	Thallium	99.0	101	99.5	101		1.27

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2209570
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2209570
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2209570

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	11/30/2020	11/30/2020 13:55	Elliott D. Healy	12/01/2020 17:39	Betina Topolski	2209570
EPA 200.8 Rev. 5.4	11/30/2020	11/30/2020 13:55	Elliott D. Healy	12/02/2020 18:44	Alexander Thompson	2209570
SM 2340B	11/30/2020			12/01/2020 17:39	Betina Topolski	2209570