

Chemical Analysis Report

CEN-DIST-2021-01-22-01

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

Event Description: **Little Sawgrass/Lake of the Woods**
Request ID: **RQ-2021-01-18-52**
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: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 12-FEB-2021 10:39



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: Nutrients.

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: Lake Of The Woods Center

Collection Date/Time: 01/21/2021 11:50

Field ID: G4CE0205

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2220705	EPA 180.1 Rev. 2.0	Turbidity	6.0		NTU	P392825	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P392955	
		Sulfate	21		mg SO4/L	P392957	
	SM 2120 B-2011	Color (true)	9.0		PCU	P392770	
	SM 2320 B-2011	Total Alkalinity	76		mg CaCO3/L	P392871	
	SM 2540 C-2011	TDS	130		mg/L	P393352	
	SM 2540 D-2011	TSS	11		mg/L	P393295	
	SM 4500 F-C-2011	Fluoride	0.056	I	mg F/L	P393220	
2220706	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P393457	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.98		mg N/L	P393180	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P392883	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P393246	
	SM 5310 B-2011	Organic Carbon	4.5		mg C/L	P393048	
2220707	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P392767	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392825

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392955

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392957

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393457

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393180

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392883

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393246

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392767

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B-2011
Batch ID: P392770

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P392871

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P393352

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P393295

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P393220

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P393048

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392955

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392957

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393457

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393180

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392883

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393246

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392767

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.8		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P392770

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.6		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P392871

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.4		P	93 - 104

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P393220

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P393048

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392955

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220626	Chloride	97.7		P	90 - 110
2220705	Chloride	97.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392957

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220626	Sulfate	98.4		P	90 - 110
2220705	Sulfate	97.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393457

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220706	Ammonia-N	93.9	96.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220706	Kjeldahl Nitrogen	105	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392883

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220677	NO2NO3-N	96.2	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393246

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220677	Total-P	106	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392767

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220634	O-Phosphate-P	97.2	99.3	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P393220

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221661	Fluoride	101	101	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P393048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220678	Organic Carbon	100	99.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220674	Turbidity	6.08	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392955

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220626	Chloride	0.0401	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392957

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220626	Sulfate	0.576	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393457

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220706	Ammonia-N	2.04	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220706	Kjeldahl Nitrogen	0.736	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392883

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220677	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393246

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220677	Total-P	0.932	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220634	O-Phosphate-P	1.68	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P392770

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220676	Color (true)	1.44	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P392871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220787	Total Alkalinity	3.43	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P393352

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220663	TDS	5.28	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P393220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221661	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P393048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220678	Organic Carbon	0.532	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A103194

Included Lab Sample IDs: 2220707

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	99.6	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A103195

Included Lab Sample IDs: 2220705

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.1	99.8	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A103212

Included Lab Sample IDs: 2220705

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A103226

Included Lab Sample IDs: 2220705

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.0	99.1	P/P	90 - 110
Sulfate	97.0	97.9	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A103229

Included Lab Sample IDs: 2220705

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.9	94.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103236

Included Lab Sample IDs: 2220706

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	100	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A103283

Included Lab Sample IDs: 2220706

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	97.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A103352

Included Lab Sample IDs: 2220705

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A103356

Included Lab Sample IDs: 2220706

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.7	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103391

Included Lab Sample IDs: 2220706

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	97.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A103454

Included Lab Sample IDs: 2220706

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.9	90.6	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	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					6.08	
EPA 300.0 Rev. 2.1	Chloride	98.3	97.7	97.4		0.0401	
	Sulfate	97.7	98.4	97.4		0.576	
EPA 350.1 Rev. 2.0	Ammonia-N	99.0	93.9	96.1			2.04
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	105	103			0.736
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	96.2	96.2			0.0
EPA 365.1 Rev. 2.0	Total-P	104	106	107			0.932
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	97.2	99.3			1.68
SM 2120 B-2011	Color (true)	97.6				1.44	
SM 2320 B-2011	Total Alkalinity	96.4				3.43	
SM 2540 C-2011	TDS					5.28	
SM 4500 F-C-2011	Fluoride	100	101	101			0.0
SM 5310 B-2011	Organic Carbon	96.8	100	99.2			0.532

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2220705
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2220705
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2220705
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2220706
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2220706
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2220706
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2220706
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2220707
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2220705
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2220705
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2220705
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2220705
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2220705
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2220706

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	01/22/2021			01/22/2021 15:44	Yen Ta	2220705
EPA 300.0 Rev. 2.1	01/22/2021			01/26/2021 17:43	Lipi Saha	2220705
EPA 350.1 Rev. 2.0	01/22/2021			02/05/2021 19:14	Ping Hua	2220706
EPA 351.2 Rev. 2.0	01/22/2021	02/01/2021 09:53	Yen Ta	02/01/2021 20:32	Julia Storbeck	2220706
EPA 353.2 Rev. 2.0	01/22/2021			01/26/2021 09:30	Beverly Y. Sanders	2220706
EPA 365.1 Rev. 2.0	01/22/2021	02/02/2021 13:00	Lipi Saha	02/03/2021 13:53	Shengyu Wang	2220706
EPA 365.1 Rev. 2.0 dissolved	01/22/2021			01/22/2021 16:08	Ping Hua	2220707
SM 2120 B-2011	01/22/2021			01/22/2021 16:44	Madeline Gruver	2220705
SM 2320 B-2011	01/22/2021			01/25/2021 18:48	Dale L. Simmons	2220705
SM 2540 C-2011	01/22/2021			01/26/2021 14:21	Yijie Li	2220705
SM 2540 D-2011	01/22/2021			01/26/2021 14:21	Yijie Li	2220705
SM 4500 F-C-2011	01/22/2021			01/30/2021 10:02	Dale L. Simmons	2220705
SM 5310 B-2011	01/22/2021			01/26/2021 22:26	Touraj Touran	2220706