

Chemical Analysis Report

CEN-DIST-2021-10-15-01

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

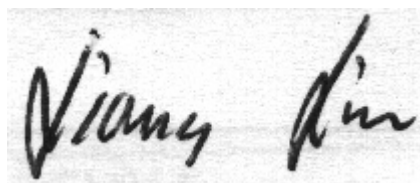
Event Description: **Lake Norris**
Request ID: **RQ-2021-10-11-54**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 09-NOV-2021 14:58

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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 Norris S of Center

Collection Date/Time: 10/14/2021 11:27

Field ID: G2CE0239

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2284064	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P405131	
	EPA 300.0 Rev. 2.1	Chloride	14	A	mg Cl/L	P405449	
		Sulfate	11	A	mg SO4/L	P405451	
	SM 2120 B-2011	Color (true)	690		PCU	P405134	
	SM 2320 B-2011	Total Alkalinity	28		mg CaCO3/L	P405390	
	SM 2540 C-2011	TDS	205		mg/L	P405599	
	SM 2540 D-2011	TSS	3	I	mg/L	P405595	
	SM 4500 F-C-2011	Fluoride	0.094	I	mg F/L	P405393	
2284065	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P405588	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P405321	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P405458	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P405331	
	SM 5310 B-2011	Organic Carbon	49		mg C/L	P405620	
2284066	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.030		mg P/L	P405127	

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: P405131

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405449

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405451

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405588

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405321

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405458

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405331

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405127

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

Reference Method: SM 2120 B-2011
Batch ID: P405134

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P405390

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

Reference Method: SM 2540 C-2011
Batch ID: P405599

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P405595

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P405393

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P405620

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: P405449

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405451

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405588

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405321

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	100		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405458

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405331

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405127

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	102		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P405134

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P405390

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	94 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P405393

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P405620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405449

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284064	Chloride	103		P	90 - 110
2284350	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405451

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284064	Sulfate	103		P	90 - 110
2284350	Sulfate	99.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284009	Ammonia-N	98.6	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405321

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2282622	Kjeldahl Nitrogen	89.9	98.0	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284241	NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284065	Total-P	103	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405127

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2283925	O-Phosphate-P	97.5	97.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P405393

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284238	Fluoride	101	102	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P405620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2284221	Organic Carbon	98.9	99.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P405131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284055	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405449

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284064	Chloride	0.801	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P405451

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284064	Sulfate	0.373	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284009	Ammonia-N	0.429	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P405321

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2282622	Kjeldahl Nitrogen	4.58	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284241	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284065	Total-P	2.20	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405127

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2283925	O-Phosphate-P	0.175	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P405134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284055	Color (true)	5.41	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P405390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284238	Total Alkalinity	0.532	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P405599

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284005	TDS	2.22	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P405393

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284238	Fluoride	0.473	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P405620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2284221	Organic Carbon	0.212	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: A108361

Included Lab Sample IDs: 2284066

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A108362

Included Lab Sample IDs: 2284064

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A108363

Included Lab Sample IDs: 2284064

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 115

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A108426

Included Lab Sample IDs: 2284064

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.7	100	P/P	90 - 110
Sulfate	99.1	100	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A108464

Included Lab Sample IDs: 2284064

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.7	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A108464

Included Lab Sample IDs: 2284064

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A108465

Included Lab Sample IDs: 2284065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.5	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A108480

Included Lab Sample IDs: 2284065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A108481

Included Lab Sample IDs: 2284065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A108537

Included Lab Sample IDs: 2284065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.9	97.6	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A108545

Included Lab Sample IDs: 2284065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.6	96.0	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		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					0.0	
EPA 300.0 Rev. 2.1	Chloride	101	103	100		0.801	
	Sulfate	101	103	99.7		0.373	
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	98.6	99.2			0.429
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	89.9	98.0			4.58
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	99.5	99.5			0.0
EPA 365.1 Rev. 2.0	Total-P	99.6	103	101			2.20
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	97.5	97.7			0.175
SM 2120 B-2011	Color (true)	101				5.41	
SM 2320 B-2011	Total Alkalinity	100				0.532	
SM 2540 C-2011	TDS					2.22	
SM 4500 F-C-2011	Fluoride	102	101	102			0.473
SM 5310 B-2011	Organic Carbon	96.2	98.9	99.2			0.212

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2284064
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2284064
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2284064
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2284065
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2284065
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2284065
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2284065
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2284066
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2284064
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2284064
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2284064
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2284064
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2284064
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2284065

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	10/15/2021			10/15/2021 16:27	Khloe J Berg	2284064
EPA 300.0 Rev. 2.1	10/15/2021			10/21/2021 12:21	Lipi Saha	2284064
EPA 350.1 Rev. 2.0	10/15/2021			10/26/2021 12:31	Ping Hua	2284065
EPA 351.2 Rev. 2.0	10/15/2021	10/20/2021 12:20	Benjamin T. Nordmann	10/21/2021 11:14	Alexandra J Mattheus	2284065
EPA 353.2 Rev. 2.0	10/15/2021			10/21/2021 10:35	Beverly Y. Sanders	2284065
EPA 365.1 Rev. 2.0	10/15/2021	10/20/2021 14:17	Simonne.V. Calhoun	10/22/2021 11:07	Lipi Saha	2284065
EPA 365.1 Rev. 2.0 dissolved	10/15/2021			10/15/2021 15:34	James L Waggerby	2284066
SM 2120 B-2011	10/15/2021			10/15/2021 17:48	Benjamin T. Nordmann	2284064
SM 2320 B-2011	10/15/2021			10/20/2021 22:12	Dale L. Simmons	2284064
SM 2540 C-2011	10/15/2021			10/19/2021 15:08	Yijie Li	2284064
SM 2540 D-2011	10/15/2021			10/19/2021 15:08	Yijie Li	2284064
SM 4500 F-C-2011	10/15/2021			10/20/2021 22:12	Dale L. Simmons	2284064
SM 5310 B-2011	10/15/2021			10/26/2021 00:58	Khloe J Berg	2284065