

Chemical Analysis Report

CEN-DIST-2021-04-29-02

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

Event Description: **Apopka Spring**
Request ID: **RQ-2021-03-29-04**
Customer: **CEN-DIST**
Project ID: **SMP**

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

Date Certified: 24-MAY-2021 10:52

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: Apopka Spring near boil

Collection Date/Time: 04/28/2021 09:58

Field ID: G1CE0113

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2243858	EPA 180.1 Rev. 2.0	Turbidity	6.9		NTU	P397431	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P398427	
		Sulfate	12		mg SO4/L	P398428	
	SM 2120 B-2011	Color (true)	11	A	PCU	P397440	
	SM 2320 B-2011	Total Alkalinity	102		mg CaCO3/L	P398015	
	SM 2540 C-2011	TDS	182		mg/L	P397912	
	SM 2540 D-2011	TSS	5	I	mg/L	P397791	
	SM 4500 F-C-2011	Fluoride	0.13		mg F/L	P397576	
2243859	EPA 350.1 Rev. 2.0	Ammonia-N	0.034		mg N/L	P398136	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P397766	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.0		mg N/L	P397641	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P397677	
	SM 5310 B-2011	Organic Carbon	9.8		mg C/L	P397804	
2243860	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P397421	

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: P397431

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398427

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398428

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398136

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397766

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397641

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397677

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397421

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

Reference Method: SM 2120 B-2011
Batch ID: P397440

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P398015

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

Reference Method: SM 2540 C-2011
Batch ID: P397912

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P397791

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P397576

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P397804

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: P398427

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398428

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398136

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397766

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397641

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	95.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397677

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397421

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

Reference Method: SM 2120 B-2011
Batch ID: P397440

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P398015

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.9		P	93 - 104

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P397576

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P397804

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243654	Chloride	99.5		P	90 - 110
2244094	Chloride	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243654	Sulfate	100		P	90 - 110
2244094	Sulfate	99.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398136

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243772	Ammonia-N	96.4	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397766

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243848	Kjeldahl Nitrogen	107	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397641

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243772	NO2NO3-N	94.0	95.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397677

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243859	Total-P	106	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397421

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243728	O-Phosphate-P	93.4	94.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P397576

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243829	Fluoride	101	101	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P397804

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2243830	Organic Carbon	95.3	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P397431

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243771	Turbidity	0.463	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398427

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244094	Chloride	2.57	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244094	Sulfate	5.54	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398136

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243772	Ammonia-N	1.83	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397766

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243848	Kjeldahl Nitrogen	2.41	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397641

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243772	NO2NO3-N	1.58	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397677

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243859	Total-P	2.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243728	O-Phosphate-P	1.28	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P397440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243858	Color (true)	0.915	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P398015

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243829	Total Alkalinity	0.128	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P397912

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243829	TDS	3.44	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P397576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243829	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P397804

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2243830	Organic Carbon	0.689	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: A105087

Included Lab Sample IDs: 2243860

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A105090

Included Lab Sample IDs: 2243858

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.5	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A105091

Included Lab Sample IDs: 2243858

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

Reference Method: SM 4500 F-C-2011

Run ID: A105140

Included Lab Sample IDs: 2243858

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A105164

Included Lab Sample IDs: 2243859

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	95.5	94.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A105214

Included Lab Sample IDs: 2243859

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	101	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A105235

Included Lab Sample IDs: 2243859

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.9	96.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A105338

Included Lab Sample IDs: 2243859

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	98.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-2011

Run ID: A105344

Included Lab Sample IDs: 2243858

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.4	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A105402

Included Lab Sample IDs: 2243859

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	98.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A105509

Included Lab Sample IDs: 2243858

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	102	P/P	90 - 110
Sulfate	100	102	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	MS
EPA 180.1 Rev. 2.0	Turbidity				0.463	
EPA 300.0 Rev. 2.1	Chloride	99.9	99.5	99.5	2.57	
	Sulfate	100	99.0	100	5.54	
EPA 350.1 Rev. 2.0	Ammonia-N	98.8	96.4	98.6		1.83
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.8	107	103		2.41
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	95.5	94.0	95.5		1.58
EPA 365.1 Rev. 2.0	Total-P	107	106	109		2.00
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	93.4	94.6		1.28
SM 2120 B-2011	Color (true)	102			0.915	
SM 2320 B-2011	Total Alkalinity	98.9			0.128	
SM 2540 C-2011	TDS				3.44	
SM 4500 F-C-2011	Fluoride	98.2	101	101		0.0
SM 5310 B-2011	Organic Carbon	95.4	95.3	96.4		0.689

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2243858
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2243858
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2243858
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2243859
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2243859
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2243859
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2243859
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2243860
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2243858
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2243858
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2243858
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2243858
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2243858
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2243859

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	04/29/2021			04/29/2021 17:28	Yen Ta	2243858
EPA 300.0 Rev. 2.1	04/29/2021			05/18/2021 21:35	Lipi Saha	2243858
EPA 350.1 Rev. 2.0	04/29/2021			05/12/2021 14:21	Julia Storbeck	2243859
EPA 351.2 Rev. 2.0	04/29/2021	05/06/2021 13:53	Benjamin T. Nordmann	05/11/2021 13:04	Virginia P. Brown	2243859
EPA 353.2 Rev. 2.0	04/29/2021			05/04/2021 13:08	Beverly Y. Sanders	2243859
EPA 365.1 Rev. 2.0	04/29/2021	05/05/2021 14:05	Yen Ta	05/06/2021 11:02	Shengyu Ding	2243859
EPA 365.1 Rev. 2.0 dissolved	04/29/2021			04/29/2021 14:40	Blanca Fach	2243860
SM 2120 B-2011	04/29/2021			04/29/2021 16:48	Sarah A Nixon	2243858
SM 2320 B-2011	04/29/2021			05/11/2021 19:28	Dale L. Simmons	2243858
SM 2540 C-2011	04/29/2021			05/04/2021 15:06	Yijie Li	2243858
SM 2540 D-2011	04/29/2021			05/04/2021 15:06	Yijie Li	2243858
SM 4500 F-C-2011	04/29/2021			05/03/2021 20:44	Dale L. Simmons	2243858
SM 5310 B-2011	04/29/2021			05/06/2021 08:50	Madeline Gruver	2243859