Chemical Analysis Report

CEN-DIST-2021-07-13-01

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-2021-04-05-16**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 05-AUG-2021 10:16

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: 07/12/2021 11:05**

Field ID: G1CE0113 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2261462	EPA 180.1 Rev. 2.0	Turbidity	6.4		NTU	P400904	
	EPA 300.0 Rev. 2.1	Chloride	29	A	mg Cl/L	P401188	
		Sulfate	12	A	mg SO4/L	P401191	
	SM 2120 B-2011	Color (true)	38	A	PCU	P400893	
	SM 2320 B-2011	Total Alkalinity	110		mg CaCO3/L	P401021	RPD
	SM 2540 C-2011	TDS	196		mg/L	P401316	
	SM 2540 D-2011	TSS	19	I	mg/L	P401121	
	SM 4500 F-C-2011	Fluoride	0.20		mg F/L	P401024	
2261463	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P401325	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P401714	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P400939	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P400931	
	SM 5310 B-2011	Organic Carbon	16		mg C/L	P401309	
2261464	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P400865	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated because of sample matrix interference.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P400904

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401188

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401191

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401325

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401714

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400939

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400931

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400865

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

Reference Method: SM 2120 B-2011
Batch ID: P400893

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P401021

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-2011
Batch ID: P401316

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P401121

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P401024

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P401309

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: P401188

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401191

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401325

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401714

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400939

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400931

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	105		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400865

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.4		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P400893

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.8		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P401021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	94 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P401024

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P401309

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.3		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401188

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2261462	Chloride	97.1		P	90 - 110
2261547	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2261462	Sulfate	98.1		P	90 - 110
2261547	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401325

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2261502	Ammonia-N	100	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400939

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2261408	NO2NO3-N	92.0	92.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400865

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2261464	O-Phosphate-P	91.5	92.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P401024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2260932	Fluoride	95.7	98.0	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P401309

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2261556	Organic Carbon	97.6	98.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P400904

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261406	Turbidity	0.786	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261462	Chloride	0.695	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261462	Sulfate	1.03	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401325

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261502	Ammonia-N	1.90	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261463	Kjeldahl Nitrogen	0.540	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261408	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261459	Total-P	0.946	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400865

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261464	O-Phosphate-P	1.41	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B-2011
Batch ID: P400893

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261462	Color (true)	1.99	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P401021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2260932	Total Alkalinity	5.51	Sample	F	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P401316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261458	TDS	6.17	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P401024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2260932	Fluoride	1.90	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P401309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2261556	Organic Carbon	0.479	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: A106583
Included Lab Sample IDs: 2261464

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.9	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A106593
Included Lab Sample IDs: 2261462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A106600
Included Lab Sample IDs: 2261462

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A106607
Included Lab Sample IDs: 2261463

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	95.0	94.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A106635
Included Lab Sample IDs: 2261463

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

Reference Method: SM 2320 B-2011
Run ID: A106641
Included Lab Sample IDs: 2261462

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

Reference Method: SM 4500 F-C-2011
Run ID: A106641
Included Lab Sample IDs: 2261462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	105	103	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A106703
Included Lab Sample IDs: 2261462

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A106744
Included Lab Sample IDs: 2261463

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	97.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A106749
Included Lab Sample IDs: 2261463

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	98.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107023
Included Lab Sample IDs: 2261463

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.8	99.0	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		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					0.786	
EPA 300.0 Rev. 2.1	Chloride	102	97.1	101		0.695	
	Sulfate	102	98.1	102		1.03	
EPA 350.1 Rev. 2.0	Ammonia-N	101	100	102			1.90
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.8					0.540
EPA 353.2 Rev. 2.0	NO2NO3-N	94.0	92.0	92.0			0.0
EPA 365.1 Rev. 2.0	Total-P	105					0.946
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	91.5	92.8			1.41
SM 2120 B-2011	Color (true)	98.8				1.99	
SM 2320 B-2011	Total Alkalinity	103				5.51	
SM 2540 C-2011	TDS					6.17	
SM 4500 F-C-2011	Fluoride	100	95.7	98.0			1.90
SM 5310 B-2011	Organic Carbon	96.3	97.6	98.2			0.479

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2261462
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2261462
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2261462
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2261463
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2261463
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2261463
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2261463
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2261464
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2261462
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2261462
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2261462
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2261462
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2261462
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2261463

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	07/13/2021			07/13/2021 16:23	Sarah A Nixon	2261462
EPA 300.0 Rev. 2.1	07/13/2021			07/19/2021 19:37	Lipi Saha	2261462
EPA 350.1 Rev. 2.0	07/13/2021			07/21/2021 14:20	Ping Hua	2261463
EPA 351.2 Rev. 2.0	07/13/2021	07/30/2021 10:15	Benjamin T. Nordmann	08/03/2021 09:51	Virginia P. Brown	2261463
EPA 353.2 Rev. 2.0	07/13/2021			07/14/2021 10:27	Beverly Y. Sanders	2261463
EPA 365.1 Rev. 2.0	07/13/2021	07/14/2021 13:05	Simonne.V. Calhoun	07/15/2021 12:17	Shengyu Ding	2261463
EPA 365.1 Rev. 2.0 dissolved	07/13/2021			07/13/2021 15:04	Ping Hua	2261464
SM 2120 B-2011	07/13/2021			07/13/2021 17:38	Sarah A Nixon	2261462
SM 2320 B-2011	07/13/2021			07/15/2021 08:36	Dale L. Simmons	2261462
SM 2540 C-2011	07/13/2021			07/14/2021 14:33	Yijie Li	2261462
SM 2540 D-2011	07/13/2021			07/14/2021 14:02	Yijie Li	2261462
SM 4500 F-C-2011	07/13/2021			07/15/2021 08:36	Dale L. Simmons	2261462
SM 5310 B-2011	07/13/2021			07/20/2021 20:43	Touraj Touran	2261463