Chemical Analysis Report

CEN-DIST-2022-06-17-01

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-2022-06-13-20**
Customer: **CEN-DIST**
Project ID: **SMP**

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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: 06/16/2022 10:54**

Field ID: G1CE0113 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2335484	DEP SOP: NU-094-1	Color (true)**	17		PCU	P415401	
	EPA 180.1 Rev. 2.0	Turbidity	9.5		NTU	P415372	
	EPA 300.0 Rev. 2.1	Chloride	31		mg Cl/L	P415805	
		Sulfate	34		mg SO4/L	P415807	
	SM 2320 B-2011	Total Alkalinity	118		mg CaCO3/L	P415767	
	SM 2540 C-2011	TDS	252		mg/L	P415864	
	SM 2540 D-2011	TSS	24	I	mg/L	P415796	
	SM 4500-F- C-2011	Fluoride	0.21		mg F/L	P415771	
2335485	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P415884	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.1		mg N/L	P415712	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.01	I	mg N/L	P416127	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P415812	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P415533	

Ref. Method and Comment:
SM 2540 D-2011: The PQL was elevated because of sample matrix interference.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P415401

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P415372

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415805

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415807

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415884

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415712

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416127

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415812

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

Reference Method: SM 2320 B-2011
Batch ID: P415767

Component	Result	Code	Units
Total Alkalinity	1.0	U	mg CaCO3/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P415864

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P415796

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P415771

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P415533

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P415401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P415372

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	98.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415805

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415807

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415884

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415712

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416127

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: P415812

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

Reference Method: SM 2320 B-2011
Batch ID: P415767

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P415771

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.9		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P415533

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415805

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2335624	Chloride	96.3		P	90 - 110
2335626	Chloride	94.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415807

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2335624	Sulfate	95.9		P	90 - 110
2335626	Sulfate	95.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2336489	Ammonia-N	98.4	95.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415712

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2335325	Kjeldahl Nitrogen	110	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416127

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2335416	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415812

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2335450	Total-P	103	105	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P415771

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2335661	Fluoride	99.9	99.9	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P415533

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2335222	Organic Carbon	97.2	98.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P415401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335415	Color (true)	0.683	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P415372

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335320	Turbidity	3.65	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335624	Chloride	0.146	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415807

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335624	Sulfate	0.0244	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2336489	Ammonia-N	2.96	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415712

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335325	Kjeldahl Nitrogen	6.24	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416127

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335416	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415812

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335450	Total-P	1.44	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P415767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335661	Total Alkalinity	0.256	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P415864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335084	TDS	2.86	Sample	P	0 - 10

Reference Method: SM 2540 D-2011
Batch ID: P415796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335084	TSS	2.67	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P415771

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335661	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P415533

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2335222	Organic Carbon	1.00	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A112901
Included Lab Sample IDs: 2335484

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	101	P/P	95 - 105

Reference Method: DEP SOP: NU-094-1
Run ID: A112913
Included Lab Sample IDs: 2335484

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	103	P/P	85 - 115

Reference Method: SM 5310 B-2011
Run ID: A112972
Included Lab Sample IDs: 2335485

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.2	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A112976
Included Lab Sample IDs: 2335484

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	96.2	97.7	P/P	90 - 110
Sulfate	98.6	99.8	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A113067
Included Lab Sample IDs: 2335484

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	97.8	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A113067
Included Lab Sample IDs: 2335484

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A113138
Included Lab Sample IDs: 2335485

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113146
Included Lab Sample IDs: 2335485

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	97.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A113200
Included Lab Sample IDs: 2335485

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A113268
Included Lab Sample IDs: 2335485

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	100	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
DEP SOP: NU-094-1	Color (true)	102				0.683	
EPA 180.1 Rev. 2.0	Turbidity	98.0				3.65	
EPA 300.0 Rev. 2.1	Chloride	97.0	96.3	94.0		0.146	
	Sulfate	99.3	95.9	95.4		0.0244	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	98.4	95.2			2.96
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	110	100			6.24
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	100	100			0.499
EPA 365.1 Rev. 2.0	Total-P	102	103	105			1.44
SM 2320 B-2011	Total Alkalinity	101				0.256	
SM 2540 C-2011	TDS					2.86	
SM 2540 D-2011	TSS					2.67	
SM 4500-F- C-2011	Fluoride	99.9	99.9	99.9			0.0
SM 5310 B-2011	Organic Carbon	94.8	97.2	98.4			1.00

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2335484
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2335484
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2335484
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2335484
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2335485
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2335485
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2335485
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2335485
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2335484
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2335484
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2335484
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2335484
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2335485

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	06/17/2022			06/17/2022 18:08	Blanca Fach	2335484
EPA 180.1 Rev. 2.0	06/17/2022			06/17/2022 14:21	Khloe J Berg	2335484
EPA 300.0 Rev. 2.1	06/17/2022			06/24/2022 20:22	Anna M. Plaviak	2335484
EPA 350.1 Rev. 2.0	06/17/2022			06/28/2022 12:10	Ping Hua	2335485
EPA 351.2 Rev. 2.0	06/17/2022	06/27/2022 14:35	Samantha L Bates	06/28/2022 14:51	Alexandra J Mattheus	2335485
EPA 353.2 Rev. 2.0	06/17/2022			07/05/2022 08:49	Beverly Y. Sanders	2335485
EPA 365.1 Rev. 2.0	06/17/2022	06/28/2022 16:02	Adam P Silver	06/30/2022 11:18	James L Waggerby	2335485
SM 2320 B-2011	06/17/2022			06/25/2022 06:21	Dale L. Simmons	2335484
SM 2540 C-2011	06/17/2022			06/21/2022 14:32	Yijie Li	2335484
SM 2540 D-2011	06/17/2022			06/21/2022 14:32	Yijie Li	2335484
SM 4500-F- C-2011	06/17/2022			06/25/2022 06:21	Dale L. Simmons	2335484
SM 5310 B-2011	06/17/2022			06/21/2022 21:10	Khloe J Berg	2335485