

Chemical Analysis Report

CEN-DIST-2019-09-12-01

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

Event Description: **Spring Garden Creek**
Request ID: **RQ-2019-09-09-44**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 02-OCT-2019 15:48

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: SPRING GARDEN CREEK @ 200M US OF LAKE WOODRUFF **Collection Date/Time: 09/11/2019 11:30**

Field ID: G2CE0081

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2118587	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P370587	
	EPA 300.0 Rev. 2.1	Chloride	160		mg Cl/L	P370812	
		Sulfate	24		mg SO4/L	P370815	
		Color (true)	310		PCU	P370575	
	SM 2320 B-97	Total Alkalinity	65		mg CaCO3/L	P371032	
	SM 2540 C-97	TDS	446		mg/L	P370850	
	SM 2540 D-97	TSS	3	I	mg/L	P370799	
	SM 4500 F-C-97	Fluoride	0.070	I	mg F/L	P371510	
2118588	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P370844	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P370726	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P370634	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P370646	
	SM 5310 B-00	Organic Carbon	32		mg C/L	P370754	
2118589	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.095		mg P/L	P370580	

Ref. Method and Comment:

SM 2540 D-97: 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: P370587

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370812

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370815

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370844

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370726

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370634

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370646

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370580

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

Reference Method: SM 2120 B
Batch ID: P370575

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P371032

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

Reference Method: SM 2540 C-97
Batch ID: P370850

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P370799

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P371510

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P370754

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: P370812

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370815

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370844

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370726

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370634

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: P370646

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370580

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

Reference Method: SM 2120 B
Batch ID: P370575

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P371032

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P371510

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P370754

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370812

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118065	Chloride	103	104	P/P	90 - 110
2118275	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118065	Sulfate	103	105	P/P	90 - 110
2118275	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370844

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118900	Ammonia-N	100	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370726

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118282	Kjeldahl Nitrogen	109	110	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370634

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118465	NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118280	Total-P	104	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370580

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118284	O-Phosphate-P	96.0	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P371510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119000	Fluoride	98.1	98.1	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P370754

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118256	Organic Carbon	103	104	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P370587

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118544	Turbidity	2.21	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P370812

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118065	Chloride	0.959	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P370815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118065	Sulfate	1.67	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P370844

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118900	Ammonia-N	1.57	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P370726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118282	Kjeldahl Nitrogen	0.464	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P370634

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118465	NO2NO3-N	0.602	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P370646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118280	Total-P	2.51	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P370580

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118284	O-Phosphate-P	1.06	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P370575

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118682	Color (true)	0.0513	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P371032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119000	Total Alkalinity	0.777	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P370850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118464	TDS	2.25	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P371510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119000	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P370754

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118256	Organic Carbon	0.378	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A94159

Included Lab Sample IDs: 2118587

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

Reference Method: SM 2120 B

Run ID: A94165

Included Lab Sample IDs: 2118587

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94166

Included Lab Sample IDs: 2118589

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: A94168

Included Lab Sample IDs: 2118587

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	100	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94193

Included Lab Sample IDs: 2118588

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94245

Included Lab Sample IDs: 2118588

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.4	99.9	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A94255

Included Lab Sample IDs: 2118588

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94277

Included Lab Sample IDs: 2118588

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94295

Included Lab Sample IDs: 2118588

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

Reference Method: SM 2320 B-97

Run ID: A94353

Included Lab Sample IDs: 2118587

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	105	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A94568

Included Lab Sample IDs: 2118587

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					2.21	
EPA 300.0 Rev. 2.1	Chloride	102	103	104	101		0.959
	Sulfate	103	103	105	102		1.67
EPA 350.1 Rev. 2.0	Ammonia-N	99.5	100	97.9			1.57
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	109	110			0.464
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	99.5	100			0.602
EPA 365.1 Rev. 2.0	Total-P	100	104	101			2.51
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	96.0	97.2			1.06
SM 2120 B	Color (true)	99.6				0.0513	
SM 2320 B-97	Total Alkalinity	104				0.777	
SM 2540 C-97	TDS					2.25	
SM 4500 F-C-97	Fluoride	96.1	98.1	98.1			0.0
SM 5310 B-00	Organic Carbon	102	103	104			0.378

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2118587
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2118587
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2118587
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2118588
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2118588
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2118588
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2118588
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2118589
SM 2120 B / E31780	True Color measured at 450 nm	2118587
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2118587
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2118587
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2118587
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2118587
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2118588

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	09/12/2019			09/12/2019 17:00	Samantha Davila	2118587
EPA 300.0 Rev. 2.1	09/12/2019			09/14/2019 11:01	Jhamieka S. Greenwood	2118587
EPA 350.1 Rev. 2.0	09/12/2019			09/17/2019 10:47	Ping Hua	2118588
EPA 351.2 Rev. 2.0	09/12/2019	09/16/2019 14:05	Sima Feizi	09/17/2019 14:19	Julia Storbeck	2118588
EPA 353.2 Rev. 2.0	09/12/2019			09/13/2019 09:36	Beverly Y. Sanders	2118588
EPA 365.1 Rev. 2.0	09/12/2019	09/13/2019 13:45	Lipi Saha	09/16/2019 13:19	Rosalyn Ballman	2118588
EPA 365.1 Rev. 2.0 dissolved	09/12/2019			09/12/2019 15:33	Jhamieka S. Greenwood	2118589
SM 2120 B	09/12/2019			09/12/2019 15:51	Madeline Funaro	2118587
SM 2320 B-97	09/12/2019			09/18/2019 08:54	Dale L. Simmons	2118587
SM 2540 C-97	09/12/2019			09/13/2019 17:30	Blanca Fach	2118587
SM 2540 D-97	09/12/2019			09/13/2019 17:30	Blanca Fach	2118587
SM 4500 F-C-97	09/12/2019			09/25/2019 19:43	Dale L. Simmons	2118587
SM 5310 B-00	09/12/2019			09/16/2019 20:53	Madeline Funaro	2118588