Chemical Analysis Report

CEN-DIST-2018-12-19-01

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

Event Description: **Bear Creek / Lil Wekiva River**
Request ID: **RQ-2018-12-17-11**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Date Certified: 08-JAN-2019 11:59

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 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: Bear Crk just North of Winter Springs Blvd in Bear Crk Par **Collection Date/Time: 12/18/2018 11:11**

Field ID: G2CE0069 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2049752	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P356420	
	EPA 300.0 Rev. 2.1	Chloride	31		mg Cl/L	P356720	
		Sulfate	12		mg SO4/L	P356722	
	SM 2120 B	Color (true)	85	A	PCU	P356447	
	SM 2320 B-97	Total Alkalinity	71		mg CaCO3/L	P356563	
	SM 2540 C-97	TDS	175	A	mg/L	P356598	
	SM 2540 D-97	TSS	3	IA	mg/L	P356640	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P356664	
2049753	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P356445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.69		mg N/L	P356434	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.25		mg N/L	P356458	
	EPA 365.1 Rev. 2.0	Total-P	0.097		mg P/L	P356417	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P356506	
2049754	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.069		mg P/L	P356404	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
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: P356420

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356720

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356722

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356445

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356434

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356458

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356417

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356404

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

Reference Method: SM 2120 B
Batch ID: P356447

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P356563

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

Reference Method: SM 2540 C-97
Batch ID: P356598

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356640

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P356664

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P356506

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: P356720

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356722

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356445

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356434

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356458

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356417

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356404

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.8		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P356447

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

Reference Method: SM 2320 B-97
Batch ID: P356563

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P356664

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.2		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356506

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356720

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049526	Chloride	95.3		P	90 - 110
2050008	Chloride	98.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356722

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049526	Sulfate	96.2		P	90 - 110
2050008	Sulfate	92.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049530	Ammonia-N	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050018	Kjeldahl Nitrogen	96.2	96.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049753	NO2NO3-N	101		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049753	Total-P	102	98.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356404

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049754	O-Phosphate-P	94.5	95.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P356664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050008	Fluoride	96.4	97.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356506

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049651	Organic Carbon	97.6	96.9	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049650	Turbidity	0.643	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356720

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049526	Chloride	0.963	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049530	Ammonia-N	0.578	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050018	Kjeldahl Nitrogen	0.0419	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049753	NO2NO3-N	0.440	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049753	Total-P	2.92	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356404

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049754	O-Phosphate-P	0.548	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P356447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049752	Color (true)	3.89	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P356563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050008	Total Alkalinity	0.807	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P356598

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049752	TDS	6.86	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P356664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050008	Fluoride	0.948	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P356506

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049651	Organic Carbon	0.371	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 365.1 Rev. 2.0 dissolved
Run ID: A88435
Included Lab Sample IDs: 2049754

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.5	97.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A88442
Included Lab Sample IDs: 2049752

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A88458
Included Lab Sample IDs: 2049753

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

Reference Method: SM 2120 B
Run ID: A88459
Included Lab Sample IDs: 2049752

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	100	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A88464
Included Lab Sample IDs: 2049753

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88487
Included Lab Sample IDs: 2049753

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

Reference Method: SM 5310 B-00
Run ID: A88488
Included Lab Sample IDs: 2049753

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.0	94.0	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A88515
Included Lab Sample IDs: 2049752

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.7	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88530
Included Lab Sample IDs: 2049753

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

Reference Method: SM 4500 F-C-97
Run ID: A88542
Included Lab Sample IDs: 2049752

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A88546
Included Lab Sample IDs: 2049752

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	101	P/P	90 - 110
Sulfate	100	99.2	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					0.643	
EPA 300.0 Rev. 2.1	Chloride	98.5	95.3	98.5		0.963	
	Sulfate	96.2	96.2	92.2			
EPA 350.1 Rev. 2.0	Ammonia-N	103	102	103			0.578
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	96.2	96.1			0.0419
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101				0.440
EPA 365.1 Rev. 2.0	Total-P	104	102	98.3			2.92
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.8	94.5	95.4			0.548
SM 2120 B	Color (true)	98.8				3.89	
SM 2320 B-97	Total Alkalinity	101				0.807	
SM 2540 C-97	TDS					6.86	
SM 4500 F-C-97	Fluoride	99.2	96.4	97.4			0.948
SM 5310 B-00	Organic Carbon	93.6	97.6	96.9			0.371

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2049752
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2049752
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2049752
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2049753
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2049753
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2049753
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2049753
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2049754
SM 2120 B / E31780	True Color measured at 450 nm	2049752
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2049752
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2049752
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2049752
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2049752
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2049753

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	12/19/2018			12/19/2018 15:08	Megan Treadwell	2049752
EPA 300.0 Rev. 2.1	12/19/2018			12/28/2018 19:31	Lipi Saha	2049752
EPA 350.1 Rev. 2.0	12/19/2018			12/19/2018 14:09	Ping Hua	2049753
EPA 351.2 Rev. 2.0	12/19/2018	12/20/2018 10:45	Adrian Shelby	12/27/2018 10:01	Joseph Suarez	2049753
EPA 353.2 Rev. 2.0	12/19/2018			12/20/2018 12:18	Lauren Bottorf	2049753
EPA 365.1 Rev. 2.0	12/19/2018	12/20/2018 10:45	Sima Feizi	12/21/2018 10:34	Beverly Y. Sanders	2049753
EPA 365.1 Rev. 2.0 dissolved	12/19/2018			12/19/2018 15:10	Jhamieka S. Greenwood	2049754
SM 2120 B	12/19/2018			12/19/2018 16:10	Chelsea Hernandez	2049752
SM 2320 B-97	12/19/2018			12/22/2018 12:46	Dale L. Simmons	2049752
SM 2540 C-97	12/19/2018			12/20/2018 14:11	Yijie Li	2049752
SM 2540 D-97	12/19/2018			12/20/2018 14:11	Yijie Li	2049752
SM 4500 F-C-97	12/19/2018			12/28/2018 04:51	Dale L. Simmons	2049752
SM 5310 B-00	12/19/2018			12/20/2018 19:50	Megan Treadwell	2049753