

Chemical Analysis Report

CEN-DIST-2016-11-23-01

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

Event Description: **Bugg Springs+SCI**
Request ID: **RQ-2016-11-14-46**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-DEC-2016 14:09

A handwritten signature in black ink, appearing to read "Liang Lin", 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 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: SWEETWATER CREEK @ 75M EAST OF MARVILLE RD.

Collection Date/Time: 11/22/2016 13:09

Field ID: G5CE0051

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852319	EPA 180.1 Rev. 2.0	Turbidity	1.8	A	NTU	P315716	
	EPA 300.0 Rev. 2.1	Chloride	78		mg Cl/L	P316119	
		Sulfate	12		mg SO4/L	P316115	
	SM 2120 B	Color (true)	59		PCU	P315706	
	SM 2320 B-97	Total Alkalinity	211		mg CaCO3/L	P315810	
	SM 2540 C-97	TDS	392		mg/L	P316228	
	SM 2540 D-97	TSS	3	I	mg/L	P316223	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P315813	
1852321	EPA 350.1 Rev. 2.0	Ammonia-N	0.023		mg N/L	P315963	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P316291	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.36		mg N/L	P316026	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P316086	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315821	
1852323	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.091		mg P/L	P315702	

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: P315716

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P316115

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P316119

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P315963

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P316291

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316026

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316086

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315702

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

Reference Method: SM 2120 B
Batch ID: P315706

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P315810

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

Reference Method: SM 2540 C-97
Batch ID: P316228

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P316223

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P315813

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P315821

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: P316115

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316119

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315963

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316291

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316026

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316086

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: P315702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.7		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P315810

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P315813

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.4		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P315821

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852258	Sulfate	97.7		P	90 - 110
1852259	Sulfate	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316119

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852258	Chloride	101		P	90 - 110
1852259	Chloride	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852321	Ammonia-N	98.5	96.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852192	Kjeldahl Nitrogen	95.5	110	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316026

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852321	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852192	Total-P	103	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852272	O-Phosphate-P	98.1	99.4	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P315813

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852076	Fluoride	98.8	99.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P315821

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852056	Organic Carbon	97.3	96.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P315716

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852319	Turbidity	7.05	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852258	Sulfate	0.444	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316119

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852258	Chloride	0.841	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852321	Ammonia-N	1.49	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852192	Kjeldahl Nitrogen	7.37	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852321	NO2NO3-N	1.05	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852192	Total-P	3.36	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852272	O-Phosphate-P	1.32	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P315706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852258	Color (true)	2.81	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P315810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852076	Total Alkalinity	0.162	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P316228

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852050	TDS	2.84	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P315813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852076	Fluoride	0.490	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P315821

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852056	Organic Carbon	0.722	Spike	P	0 - 20

Quality Assurance Report Precision

* 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: A72994

Included Lab Sample IDs: 1852323

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.8	97.4	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A72995

Included Lab Sample IDs: 1852319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A72997

Included Lab Sample IDs: 1852319

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

Reference Method: SM 2320 B-97

Run ID: A73035

Included Lab Sample IDs: 1852319

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

Reference Method: SM 4500 F-C-97

Run ID: A73035

Included Lab Sample IDs: 1852319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	97.0	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A73041

Included Lab Sample IDs: 1852321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	97.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73098

Included Lab Sample IDs: 1852321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	98.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A73117

Included Lab Sample IDs: 1852321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A73131

Included Lab Sample IDs: 1852319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Sulfate	99.1	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73183

Included Lab Sample IDs: 1852321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73260

Included Lab Sample IDs: 1852321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	104	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				7.05	
EPA 300.0 Rev. 2.1	Chloride	101	101 102		0.841	
	Sulfate	97.7	97.7 102		0.444	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	98.5 96.3			1.49
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	95.5 110			7.37
EPA 353.2 Rev. 2.0	NO2NO3-N	107	102			1.05
EPA 365.1 Rev. 2.0	Total-P	104	103 99.8			3.36
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	98.1 99.4			1.32
SM 2120 B	Color (true)				2.81	
SM 2320 B-97	Total Alkalinity	103			0.162	
SM 2540 C-97	TDS				2.84	
SM 4500 F-C-97	Fluoride	96.4	98.8 99.5			0.490
SM 5310 B-00	Organic Carbon	97.6	97.3 96.6			0.722

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1852319
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1852319
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1852319
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1852321
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1852321
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1852321
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1852321
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1852323
SM 2120 B / E31780	True Color measured at 450 nm	1852319
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1852319
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1852319
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1852319
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1852319
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1852321

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	11/23/2016			11/23/2016 14:00	Sima Feizi	1852319
EPA 300.0 Rev. 2.1	11/23/2016			12/03/2016	Ping Hua	1852319
EPA 350.1 Rev. 2.0	11/23/2016			11/30/2016	Sofia Elnemr	1852321
EPA 351.2 Rev. 2.0	11/23/2016	12/07/2016	Adrian Shelby	12/08/2016	Joseph Suarez	1852321
EPA 353.2 Rev. 2.0	11/23/2016			12/01/2016	Beverly Y. Sanders	1852321
EPA 365.1 Rev. 2.0	11/23/2016	12/02/2016	Adrian Shelby	12/05/2016	Lipi Saha	1852321
EPA 365.1 Rev. 2.0 dissolved	11/23/2016			11/23/2016 14:08	Julia Storbeck	1852323
SM 2120 B	11/23/2016			11/23/2016 14:12	Jared I. Manley	1852319
SM 2320 B-97	11/23/2016			11/29/2016	Dale L. Simmons	1852319
SM 2540 C-97	11/23/2016			11/26/2016	Yijie Li	1852319
SM 2540 D-97	11/23/2016			11/26/2016	Yijie Li	1852319
SM 4500 F-C-97	11/23/2016			11/29/2016	Dale L. Simmons	1852319
SM 5310 B-00	11/23/2016			11/29/2016	Julie Michelle Frank	1852321