

Chemical Analysis Report

CEN-DIST-2016-11-10-03

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

Event Description: **Lake Blue Springs**
Request ID: **RQ-2016-10-31-62**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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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 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: Blue Springs (Lake Co.) @ Weir

Collection Date/Time: 11/09/2016 12:35

Field ID: G1CE0024

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848935	EPA 180.1 Rev. 2.0	Turbidity	0.30		NTU	P315004	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P315506	
		Sulfate	9.6		mg SO4/L	P315505	
	SM 2120 B	Color (true)	2.5	U	PCU	P315007	
	SM 2320 B-97	Total Alkalinity	105		mg CaCO3/L	P315212	
	SM 2540 C-97	TDS	156		mg/L	P315778	
	SM 2540 D-97	TSS	2	U	mg/L	P315560	
	SM 4500 F-C-97	Fluoride	0.084	I	mg F/L	P315215	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P315451	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P315966	
1848936	EPA 353.2 Rev. 2.0	NO2NO3-N	2.7		mg N/L	P315536	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P315330	
	SM 5310 B-00	Organic Carbon	0.64	I	mg C/L	P315272	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.035		mg P/L	P315013	
	dissolved						

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries are unavailable because of high 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: P315004

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P315505

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P315506

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P315451

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P315966

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: P315536

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315330

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315013

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

Reference Method: SM 2120 B
Batch ID: P315007

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P315212

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

Reference Method: SM 2540 C-97
Batch ID: P315778

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P315560

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P315215

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P315272

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: P315505

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315506

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315451

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: P315966

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: P315536

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315330

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315013

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

Reference Method: SM 2320 B-97
Batch ID: P315212

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P315215

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P315272

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P315506

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848920	Chloride	100		P	90 - 110
1848922	Chloride	99.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P315451

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848097	Ammonia-N	98.7	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P315966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848936	Kjeldahl Nitrogen	104	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P315536

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848595	NO2NO3-N	94.5	94.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P315330

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848936	Total-P	96.7	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P315013

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848864	O-Phosphate-P	99.3	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
 Batch ID: P315215

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1849087	Fluoride	97.1	98.9	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P315272

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848671	Organic Carbon	97.2	98.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P315004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848915	Turbidity	1.55	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P315505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848920	Sulfate	0.0570	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P315506

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848920	Chloride	0.0275	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P315451

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848097	Ammonia-N	0.0716	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P315966

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848936	Kjeldahl Nitrogen	2.05	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P315536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848595	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315330

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848936	Total-P	0.0237	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315013

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848864	O-Phosphate-P	0.312	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P315007

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848859	Color (true)	1.79	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P315212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1849087	Total Alkalinity	0.0687	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P315778

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1849088	TDS	1.39	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P315215

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1849087	Fluoride	1.56	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P315272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848671	Organic Carbon	1.18	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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A72761

Included Lab Sample IDs: 1848935

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

Reference Method: SM 2120 B

Run ID: A72762

Included Lab Sample IDs: 1848935

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A72763

Included Lab Sample IDs: 1848937

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A72821

Included Lab Sample IDs: 1848935

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

Reference Method: SM 4500 F-C-97

Run ID: A72821

Included Lab Sample IDs: 1848935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A72830

Included Lab Sample IDs: 1848935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Sulfate	98.7	97.6	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A72839

Included Lab Sample IDs: 1848936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.6	99.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A72892

Included Lab Sample IDs: 1848936

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A72925

Included Lab Sample IDs: 1848936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	94.0	92.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72933

Included Lab Sample IDs: 1848936

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73136

Included Lab Sample IDs: 1848936

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.9	95.3	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				1.55	
EPA 300.0 Rev. 2.1	Chloride	101	100	99.3	0.0275	
	Sulfate	99.0			0.0570	
EPA 350.1 Rev. 2.0	Ammonia-N	101	98.7	98.8		0.0716
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	104	102		2.05
EPA 353.2 Rev. 2.0	NO2NO3-N	97.5	94.5	94.5		0.0
EPA 365.1 Rev. 2.0	Total-P	96.4	96.7	96.7		0.0237
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	99.3	99.7		0.312
SM 2120 B	Color (true)				1.79	
SM 2320 B-97	Total Alkalinity	101			0.0687	
SM 2540 C-97	TDS				1.39	
SM 4500 F-C-97	Fluoride	97.1	97.1	98.9		1.56
SM 5310 B-00	Organic Carbon	96.9	97.2	98.8		1.18

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1848935
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1848935
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1848935
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1848936

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1848936
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1848936
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1848936
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1848937
SM 2120 B / E31780	True Color measured at 450 nm	1848935
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1848935
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1848935
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1848935
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1848935
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1848936

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	11/10/2016			11/10/2016 14:16	Sima Feizi	1848935
EPA 300.0 Rev. 2.1	11/10/2016			11/19/2016	Ping Hua	1848935
EPA 350.1 Rev. 2.0	11/10/2016			11/17/2016	Sofia Elnemr	1848936
EPA 351.2 Rev. 2.0	11/10/2016	12/01/2016	Adrian Shelby	12/02/2016	Joseph Suarez	1848936
EPA 353.2 Rev. 2.0	11/10/2016			11/21/2016	Beverly Y. Sanders	1848936
EPA 365.1 Rev. 2.0	11/10/2016	11/17/2016	Christopher Armour	11/21/2016	Lipi Saha	1848936
EPA 365.1 Rev. 2.0 dissolved	11/10/2016			11/10/2016 15:48	Julia Storbeck	1848937
SM 2120 B	11/10/2016			11/10/2016 15:03	Jared I. Manley	1848935
SM 2320 B-97	11/10/2016			11/16/2016	Dale L. Simmons	1848935
SM 2540 C-97	11/10/2016			11/14/2016	Sima Feizi	1848935
SM 2540 D-97	11/10/2016			11/14/2016	Sima Feizi	1848935
SM 4500 F-C-97	11/10/2016			11/16/2016	Dale L. Simmons	1848935
SM 5310 B-00	11/10/2016			11/15/2016	Julie Michelle Frank	1848936