Chemical Analysis Report

SO-DIST-2018-06-21-01

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

Event Description: **Highlands Lakes**
Request ID: **RQ-2018-06-25-16**
Customer: **SO-DIST**
Project ID: **SMP**

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FLDEP South District Office
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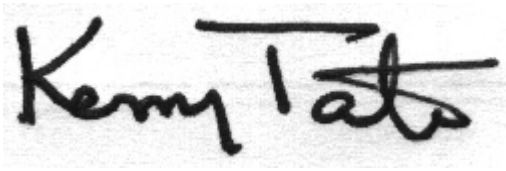
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 18-JUL-2018 11:38



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 Lake @ Center **Collection Date/Time: 06/20/2018 11:20**

Field ID: G4SD0157 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002466	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P347294	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P347540	
		Sulfate	25		mg SO4/L	P347544	
	SM 2120 B	Color (true)	13		PCU	P347278	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P347842	
	SM 2540 C-97	TDS	98		mg/L	P347649	
	SM 2540 D-97	TSS	2	U	mg/L	P347562	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P347846	
2002469	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P347556	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P348069	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P347514	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P347560	
	SM 5310 B-00	Organic Carbon	7.1		mg C/L	P347698	
2002472	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P347289	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Lachard @ Center **Collection Date/Time: 06/20/2018 13:15**

Field ID: G4SD0164 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002467	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P347294	
	EPA 300.0 Rev. 2.1	Chloride	6.0		mg Cl/L	P347540	
		Sulfate	16		mg SO4/L	P347544	
	SM 2120 B	Color (true)	6.8		PCU	P347278	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P347842	
	SM 2540 C-97	TDS	58		mg/L	P347649	
	SM 2540 D-97	TSS	2	U	mg/L	P347562	
	SM 4500 F-C-97	Fluoride	0.056	I	mg F/L	P347846	
2002470	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P347556	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54	J	mg N/L	P348069	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P347515	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P347560	
	SM 5310 B-00	Organic Carbon	4.9		mg C/L	P347698	
2002473	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P347288	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Refer to the narrative for an explanation of QC Codes.

Sample Location: Buck Lake @ Middle **Collection Date/Time: 06/20/2018 14:00**

Field ID: G4SD0158 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2002468	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P347294	
	EPA 300.0 Rev. 2.1	Chloride	20		mg Cl/L	P347540	
		Sulfate	60		mg SO4/L	P347544	
	SM 2120 B	Color (true)	5.8	I	PCU	P347278	
	SM 2320 B-97	Total Alkalinity	15	A	mg CaCO3/L	P347843	
	SM 2540 C-97	TDS	216	A	mg/L	P347649	
	SM 2540 D-97	TSS	2	UA	mg/L	P347562	
	SM 4500 F-C-97	Fluoride	0.078	I	mg F/L	P347847	
2002471	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P347556	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P348075	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	13		mg N/L	P347515	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P347560	
	SM 5310 B-00	Organic Carbon	4.0		mg C/L	P347698	
2002474	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P347288	

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: P347294

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P347540

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P347544

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P347556

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348069

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348075

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P347514

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P347515

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P347560

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P347288

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P347289

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

Reference Method: SM 2120 B
Batch ID: P347278

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P347842

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

Reference Method: SM 2320 B-97
Batch ID: P347843

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

Reference Method: SM 2540 C-97
Batch ID: P347649

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P347562

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P347846

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P347847

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P347698

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: P347540

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P347544

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P347556

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.5		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348069

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348075

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P347514

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P347515

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: P347560

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	94.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P347288

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P347289

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P347842

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P347843

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P347846

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

Reference Method: SM 4500 F-C-97
Batch ID: P347847

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

Reference Method: SM 5310 B-00
Batch ID: P347698

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P347540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002385	Chloride	100		P	90 - 110
2002419	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P347544

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002385	Sulfate	101		P	90 - 110
2002419	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P347556

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002428	Ammonia-N	98.2	94.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348069

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002470	Kjeldahl Nitrogen	89.0	88.2	F/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2003770	Kjeldahl Nitrogen	88.1	108	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P347514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002469	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P347515

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002470	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P347560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002471	Total-P	91.6	91.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P347288

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002434	O-Phosphate-P	98.4	99.3	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P347289

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002472	O-Phosphate-P	94.0	95.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P347846

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002385	Fluoride	96.3	96.3	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P347847

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002468	Fluoride	96.8	97.3	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P347698

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2002426	Organic Carbon	96.7	98.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P347294

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002419	Turbidity	16.9	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P347540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002385	Chloride	5.52	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P347544

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002385	Sulfate	5.84	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P347556

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002428	Ammonia-N	3.36	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002470	Kjeldahl Nitrogen	0.610	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P348075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2003770	Kjeldahl Nitrogen	12.3	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P347514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002469	NO2NO3-N	0.985	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P347515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002470	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P347560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002471	Total-P	0.160	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P347288

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002434	O-Phosphate-P	0.667	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P347289

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002472	O-Phosphate-P	1.69	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P347278

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002490	Color (true)	0.486	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P347842

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002385	Total Alkalinity	0.588	Sample	P	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P347843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002468	Total Alkalinity	1.01	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P347649

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002468	TDS	1.85	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P347846

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002385	Fluoride	0.0	Spike	P	0 - 3.5

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P347847

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002468	Fluoride	0.472	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P347698

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2002426	Organic Carbon	1.69	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: SM 2120 B
Run ID: A84757
Included Lab Sample IDs: 2002466, 2002467, 2002468

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A84758
Included Lab Sample IDs: 2002472, 2002473, 2002474

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	100	P/P	90 - 110
O-Phosphate-P	99.5	99.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A84760
Included Lab Sample IDs: 2002466, 2002467, 2002468

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A84842
Included Lab Sample IDs: 2002469, 2002470, 2002471

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A84847
Included Lab Sample IDs: 2002466, 2002467, 2002468

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	105	P/P	90 - 110
Chloride	105	101	P/P	90 - 110
Sulfate	103	107	P/P	90 - 110
Sulfate	107	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A84852
Included Lab Sample IDs: 2002469, 2002470, 2002471

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.0	94.7	P/P	90 - 110
Ammonia-N	96.5	96.0	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A84915
Included Lab Sample IDs: 2002469, 2002470, 2002471

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	99.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A84969
Included Lab Sample IDs: 2002466, 2002467, 2002468

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	P/P	90 - 110
Total Alkalinity	103	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A84969
Included Lab Sample IDs: 2002466, 2002467, 2002468

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	102	P/P	90 - 110
Fluoride	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84970
Included Lab Sample IDs: 2002469, 2002470, 2002471

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A85111
Included Lab Sample IDs: 2002469, 2002470

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.7	95.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A85134
Included Lab Sample IDs: 2002471

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.5	97.5	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					16.9	
EPA 300.0 Rev. 2.1	Chloride	100	100	102		5.52	
	Sulfate	100	101	101		5.84	
EPA 350.1 Rev. 2.0	Ammonia-N	95.5	98.2	94.9			3.36
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.5	89.0	88.2			0.610
	Kjeldahl Nitrogen	92.6	88.1	108			12.3
EPA 353.2 Rev. 2.0	NO2NO3-N	100	101	102			0.985
	NO2NO3-N	102	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	94.5	91.6	91.8			0.160
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	98.4	99.3			0.667
	O-Phosphate-P	97.9	94.0	95.6			1.69
SM 2120 B	Color (true)					0.486	
SM 2320 B-97	Total Alkalinity	102				0.588	
	Total Alkalinity	103				1.01	
SM 2540 C-97	TDS					1.85	
SM 4500 F-C-97	Fluoride	98.8	96.3	96.3			0.0
	Fluoride	98.8	96.8	97.3			0.472
SM 5310 B-00	Organic Carbon	100	96.7	98.4			1.69

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2002466, 2002467, 2002468
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2002466, 2002467, 2002468
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2002466, 2002467, 2002468
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2002469, 2002470, 2002471
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2002469, 2002470, 2002471
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2002469, 2002470, 2002471
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2002469, 2002470, 2002471
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2002472, 2002473, 2002474
SM 2120 B / E31780	True Color measured at 450 nm	2002466, 2002467, 2002468
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2002466, 2002467, 2002468
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2002466, 2002467, 2002468
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2002466, 2002467, 2002468
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2002466, 2002467, 2002468
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2002469, 2002470, 2002471

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	06/21/2018			06/21/2018 17:00	William L. Brown IV	2002466, 2002467, 2002468
EPA 300.0 Rev. 2.1	06/21/2018			06/26/2018 07:49	Lipi Saha	2002466
	06/21/2018			06/26/2018 08:01	Lipi Saha	2002467
	06/21/2018			06/26/2018 08:37	Lipi Saha	2002468
EPA 350.1 Rev. 2.0	06/21/2018			06/26/2018 13:18	Adrian Shelby	2002469
	06/21/2018			06/26/2018 13:25	Adrian Shelby	2002470
	06/21/2018			06/26/2018 13:27	Adrian Shelby	2002471
EPA 351.2 Rev. 2.0	06/21/2018	07/09/2018 10:25	Tanya Welborn	07/10/2018 10:14	Joseph Suarez	2002469
	06/21/2018	07/09/2018 10:25	Tanya Welborn	07/10/2018 10:15	Joseph Suarez	2002470
	06/21/2018	07/09/2018 18:30	Tanya Welborn	07/11/2018 09:39	Joseph Suarez	2002471
EPA 353.2 Rev. 2.0	06/21/2018			06/26/2018 13:40	Lauren Bottorf	2002469
	06/21/2018			06/26/2018 13:47	Lauren Bottorf	2002470
	06/21/2018			06/26/2018 15:12	Lauren Bottorf	2002471
EPA 365.1 Rev. 2.0	06/21/2018	06/26/2018 12:45	Sima Feizi	07/02/2018 14:31	Beverly Y. Sanders	2002469
	06/21/2018	06/26/2018 12:45	Sima Feizi	07/02/2018 14:32	Beverly Y. Sanders	2002470
	06/21/2018	06/26/2018 12:45	Sima Feizi	07/02/2018 14:33	Beverly Y. Sanders	2002471
EPA 365.1 Rev. 2.0 dissolved	06/21/2018			06/21/2018 15:05	Megan Treadwell	2002472
	06/21/2018			06/21/2018 15:42	Megan Treadwell	2002473
	06/21/2018			06/21/2018 15:43	Megan Treadwell	2002474
SM 2120 B	06/21/2018			06/21/2018 14:50	Tanya Welborn	2002466
	06/21/2018			06/21/2018 14:51	Tanya Welborn	2002467
	06/21/2018			06/21/2018 14:52	Tanya Welborn	2002468
SM 2320 B-97	06/21/2018			07/02/2018 01:09	Dale L. Simmons	2002466
	06/21/2018			07/02/2018 01:21	Dale L. Simmons	2002467
	06/21/2018			07/02/2018 02:58	Dale L. Simmons	2002468
SM 2540 C-97	06/21/2018			06/22/2018 15:16	William L. Brown IV	2002466, 2002467, 2002468
SM 2540 D-97	06/21/2018			06/22/2018 15:16	William L. Brown IV	2002466, 2002467, 2002468
SM 4500 F-C-97	06/21/2018			07/02/2018 01:09	Dale L. Simmons	2002466
	06/21/2018			07/02/2018 01:21	Dale L. Simmons	2002467
	06/21/2018			07/02/2018 02:50	Dale L. Simmons	2002468
SM 5310 B-00	06/21/2018			06/28/2018 03:12	Julia Storbeck	2002469
	06/21/2018			06/28/2018 03:32	Julia Storbeck	2002470
	06/21/2018			06/28/2018 03:50	Julia Storbeck	2002471