

Chemical Analysis Report

SO-DIST-2016-06-29-02

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

Event Description: **SMP: Highlands Lakes**

Request ID: **RQ-2016-05-30-13**

Customer: **SO-DIST**

Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
Attn: Ben Paswater

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 20-JUL-2016 11:53

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 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: LAKE PYTHIAS @ WEST SIDE

Collection Date/Time: 06/28/2016 09:48

Field ID: G4HL062016-C

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1811963	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P307120	
	EPA 300.0 Rev. 2.1	Chloride	20		mg Cl/L	P307885	
		Sulfate	32		mg SO4/L	P307887	
	SM 2120 B	Color (true)	13		PCU	P307105	
	SM 2320 B-97	Total Alkalinity	3.7		mg CaCO3/L	P307512	
	SM 2540 C-97	TDS	99		mg/L	P307693	
	SM 2540 D-97	TSS	3	I	mg/L	P307685	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P307514	
1811969	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P307416	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P307183	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P307247	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P307181	
	SM 5310 B-00	Organic Carbon	5.4		mg C/L	P307475	
1811975	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307096	

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 164 umhos/cm.

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: LAKE PYTHIAS @ NORTH SIDE

Collection Date/Time: 06/28/2016 09:31

Field ID: G4HL062016-B

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1811964	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P307120	
	EPA 300.0 Rev. 2.1	Chloride	20		mg Cl/L	P307885	
		Sulfate	32		mg SO4/L	P307887	
	SM 2120 B	Color (true)	13		PCU	P307105	
	SM 2320 B-97	Total Alkalinity	2.9		mg CaCO3/L	P307512	
	SM 2540 C-97	TDS	115		mg/L	P307693	
	SM 2540 D-97	TSS	3	I	mg/L	P307685	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P307514	
1811970	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P307416	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.44		mg N/L	P307184	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P307247	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P307181	
	SM 5310 B-00	Organic Carbon	5.4		mg C/L	P307475	
1811976	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307096	

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 163 umhos/cm.

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: LAKE PYTHIAS @ MIDDLE

Collection Date/Time: 06/28/2016 09:40

Field ID: G4HL062016-A

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1811965	EPA 180.1 Rev. 2.0	Turbidity	2.1	A	NTU	P307121	

Field ID: G4HL062016-A

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1811965	EPA 300.0 Rev. 2.1	Chloride	20		mg Cl/L	P307885	
		Sulfate	32		mg SO4/L	P307887	
	SM 2120 B	Color (true)	12	A	PCU	P307365	
	SM 2320 B-97	Total Alkalinity	3.0		mg CaCO3/L	P307512	
	SM 2540 C-97	TDS	122		mg/L	P307693	
	SM 2540 D-97	TSS	2	I	mg/L	P307685	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P307514	
1811971	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P307416	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45	J	mg N/L	P307184	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P307247	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P307181	
	SM 5310 B-00	Organic Carbon	5.5		mg C/L	P307475	
1811977	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307097	

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 163 umhos/cm.

SM 2540 D-97: The precision data is unavailable due to the 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: PERSIMMON LAKE CENTER

Collection Date/Time: 06/28/2016 12:05

Field ID: G4HL062016-L

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1811966	EPA 180.1 Rev. 2.0	Turbidity	21		NTU	P307121	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P307885	
		Sulfate	46		mg SO4/L	P307887	
	SM 2120 B	Color (true)	19	A	PCU	P307369	
	SM 2320 B-97	Total Alkalinity	29		mg CaCO3/L	P307512	
	SM 2540 C-97	TDS	155		mg/L	P307693	
	SM 2540 D-97	TSS	18		mg/L	P307685	
1811972	SM 4500 F-C-97	Fluoride	0.047	I	mg F/L	P307514	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P307416	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P307184	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.48		mg N/L	P307248	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P307181	
1811978	SM 5310 B-00	Organic Carbon	12		mg C/L	P307475	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307097	

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 243 umhos/cm.

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: LAKE PYTHIAS @ EAST SIDE

Collection Date/Time: 06/28/2016 09:20

Field ID: G4HL062016-E

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1811967	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P307121	
	EPA 300.0 Rev. 2.1	Chloride	22	A	mg Cl/L	P307644	
		Sulfate	34	A	mg SO4/L	P307643	

Field ID: G4HL062016-E

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1811967	SM 2120 B	Color (true)	13		PCU	P307365	
	SM 2320 B-97	Total Alkalinity	3.0		mg CaCO3/L	P307615	
	SM 2540 C-97	TDS	88		mg/L	P307693	
	SM 2540 D-97	TSS	3	I	mg/L	P307685	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P307619	
1811973	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P307416	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P307184	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P307248	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P307181	
	SM 5310 B-00	Organic Carbon	5.5		mg C/L	P307475	
1811979	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307097	

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 162 umhos/cm.

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: LAKE PYTHIAS @ SOUTH SIDE

Collection Date/Time: 06/28/2016 09:55

Field ID: G4HL062016-D

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1811968	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P307121	
	EPA 300.0 Rev. 2.1	Chloride	20		mg Cl/L	P307885	
		Sulfate	32		mg SO4/L	P307887	
	SM 2120 B	Color (true)	12		PCU	P307365	
	SM 2320 B-97	Total Alkalinity	3.0		mg CaCO3/L	P307615	
	SM 2540 C-97	TDS	95		mg/L	P307693	
	SM 2540 D-97	TSS	2	I	mg/L	P307685	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P307619	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P307416	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.41		mg N/L	P307184	MS
1811974	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P307248	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P307181	
	SM 5310 B-00	Organic Carbon	5.3		mg C/L	P307475	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P307097	
1811980							

Ref. Method and Comment:

SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 162 umhos/cm.

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P307120

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P307121

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307643

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307644

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307885

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307887

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307416

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307183

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307184

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307247

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307248

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307181

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307096

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307097

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

Reference Method: SM 2120 B
Batch ID: P307105

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P307365

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P307369

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P307512

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

Reference Method: SM 2320 B-97
Batch ID: P307615

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P307693

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P307685

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P307514

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P307619

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P307475

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: P307643

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307644

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307885

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307887

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307887

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307416

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307183

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307184

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307247

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: P307248

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: P307181

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307096

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307097

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P307512

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P307615

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P307514

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P307619

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P307475

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: P307643

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811967	Sulfate	107		P	90 - 110
1811982	Sulfate	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811967	Chloride	105		P	90 - 110
1811982	Chloride	106		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307885

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811763	Chloride	98.6		P	90 - 110
1811764	Chloride	98.3		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307887

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811763	Sulfate	99.4		P	90 - 110
1811764	Sulfate	98.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307416

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811969	Ammonia-N	97.5	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811879	Kjeldahl Nitrogen	85.6	100	F/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307184

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811971	Kjeldahl Nitrogen	94.4	89.9	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307247

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811946	NO2NO3-N	94.4	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307248

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811973	NO2NO3-N	104	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307181

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811970	Total-P	93.5	94.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811882	O-Phosphate-P	97.7	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812016	O-Phosphate-P	96.7	97.5	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P307514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811876	Fluoride	100	99.6	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P307619

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812200	Fluoride	97.4	96.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P307475

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811949	Organic Carbon	104		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P307120

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811891	Turbidity	1.40	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P307121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811965	Turbidity	2.91	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307643

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811967	Sulfate	0.0666	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811967	Chloride	0.193	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307885

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811763	Chloride	0.0668	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811763	Sulfate	0.0966	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811969	Ammonia-N	1.24	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811879	Kjeldahl Nitrogen	14.3	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811971	Kjeldahl Nitrogen	3.53	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307247

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811946	NO2NO3-N	7.92	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307248

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811973	NO2NO3-N	1.43	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307181

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811970	Total-P	1.37	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811882	O-Phosphate-P	0.907	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812016	O-Phosphate-P	0.741	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811878	Color (true)	0.979	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307365

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811965	Color (true)	0.852	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811966	Color (true)	3.48	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P307512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811876	Total Alkalinity	0.346	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P307615

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812200	Total Alkalinity	0.775	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P307693

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811981	TDS	4.29	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P307514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811876	Fluoride	0.470	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P307619

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812200	Fluoride	0.519	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P307475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811949	Organic Carbon	0.315	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: A70308
Included Lab Sample IDs: 1811975, 1811976, 1811977, 1811978, 1811979, 1811980

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

Reference Method: SM 2120 B
Run ID: A70310
Included Lab Sample IDs: 1811963, 1811964, 1811965, 1811966, 1811967, 1811968

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.7	95.6	P/P	85 - 115
Color (true)	97.3	97.1	P/P	85 - 115
Color (true)	97.7	97.3	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A70317
Included Lab Sample IDs: 1811963, 1811964, 1811965, 1811966, 1811967, 1811968

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A70364
Included Lab Sample IDs: 1811969, 1811970, 1811971, 1811972, 1811973, 1811974

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A70409

Included Lab Sample IDs: 1811969, 1811970, 1811971, 1811972, 1811973, 1811974

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	90.0	101	P/P	90 - 110
Kjeldahl Nitrogen	92.9	94.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A70410

Included Lab Sample IDs: 1811969, 1811970, 1811971, 1811972, 1811973, 1811974

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.0	97.8	P/P	90 - 110
Total-P	98.2	97.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A70419

Included Lab Sample IDs: 1811969, 1811970, 1811971, 1811972, 1811973, 1811974

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.3	P/P	90 - 110
Ammonia-N	99.3	99.7	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A70435

Included Lab Sample IDs: 1811969, 1811970, 1811971, 1811972, 1811973, 1811974

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

Reference Method: SM 2320 B-97

Run ID: A70440

Included Lab Sample IDs: 1811963, 1811964, 1811965, 1811966

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

Reference Method: SM 4500 F-C-97

Run ID: A70440

Included Lab Sample IDs: 1811963, 1811964, 1811965, 1811966

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A70443

Included Lab Sample IDs: 1811967

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	107	106	P/P	90 - 110
Sulfate	107	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A70474

Included Lab Sample IDs: 1811967, 1811968

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

Reference Method: SM 4500 F-C-97

Run ID: A70474

Included Lab Sample IDs: 1811967, 1811968

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A70540

Included Lab Sample IDs: 1811963, 1811964, 1811965, 1811966, 1811968

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.8	99.8	P/P	90 - 110
Sulfate	95.0	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		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					1.40	
	Turbidity					2.91	
EPA 300.0 Rev. 2.1	Chloride	107	105	106		0.193	
	Chloride	97.7	98.6	98.3		0.0668	
	Sulfate	105	107	105		0.0666	
	Sulfate	98.9	99.4	98.6		0.0966	
EPA 350.1 Rev. 2.0	Ammonia-N	96.9	97.5	98.8			1.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	92.0	85.6	100			14.3
	Kjeldahl Nitrogen	92.2	94.4	89.9			3.53
EPA 353.2 Rev. 2.0	NO2NO3-N	100	94.4	102			7.92
	NO2NO3-N	100	104	106			1.43
EPA 365.1 Rev. 2.0	Total-P	102	93.5	94.9			1.37
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.7	98.8			0.907
	O-Phosphate-P	104	96.7	97.5			0.741
SM 2120 B	Color (true)					0.979	
	Color (true)					0.852	
	Color (true)					3.48	
SM 2320 B-97	Total Alkalinity	102				0.346	
	Total Alkalinity	102				0.775	
SM 2540 C-97	TDS					4.29	
SM 4500 F-C-97	Fluoride	98.2	100	99.6			0.470
	Fluoride	97.0	97.4	96.8			0.519
SM 5310 B-00	Organic Carbon	100	104				0.315

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1811969, 1811970, 1811971, 1811972, 1811973, 1811974
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1811969, 1811970, 1811971, 1811972, 1811973, 1811974
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1811969, 1811970, 1811971, 1811972, 1811973, 1811974
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1811969, 1811970, 1811971, 1811972, 1811973, 1811974
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1811975, 1811976, 1811977, 1811978, 1811979, 1811980
SM 2120 B / E31780	True Color measured at 450 nm	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1811969, 1811970, 1811971, 1811972, 1811973, 1811974

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	06/29/2016			06/29/2016 15:59	Sima Feizi	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
EPA 300.0 Rev. 2.1	06/29/2016			07/08/2016	Ping Hua	1811967
	06/29/2016			07/13/2016	Ping Hua	1811963, 1811964, 1811965, 1811966, 1811968
EPA 350.1 Rev. 2.0	06/29/2016			07/06/2016	Diana M. Turner	1811969, 1811970, 1811971, 1811972, 1811973, 1811974
EPA 351.2 Rev. 2.0	06/29/2016	07/01/2016	Sofia Elnemr	07/06/2016	Christopher Armour	1811969, 1811970, 1811971, 1811972, 1811973, 1811974
EPA 353.2 Rev. 2.0	06/29/2016			07/01/2016	Beverly Y. Sanders	1811969, 1811970, 1811971, 1811972, 1811973, 1811974
EPA 365.1 Rev. 2.0	06/29/2016	07/01/2016	Vijayalakshmi Reddy	07/05/2016	Lipi Saha	1811969, 1811970, 1811971, 1811972, 1811973, 1811974
EPA 365.1 Rev. 2.0 dissolved	06/29/2016			06/29/2016 15:32	Julia Storbeck	1811975
	06/29/2016			06/29/2016 15:33	Julia Storbeck	1811976
	06/29/2016			06/29/2016 15:34	Julia Storbeck	1811977
	06/29/2016			06/29/2016 15:35	Julia Storbeck	1811978
	06/29/2016			06/29/2016 15:40	Julia Storbeck	1811979
	06/29/2016			06/29/2016 15:41	Julia Storbeck	1811980
SM 2120 B	06/29/2016			06/29/2016 16:07	Rochelle Y Jackson	1811963
	06/29/2016			06/29/2016 16:08	Rochelle Y Jackson	1811964
	06/29/2016			06/29/2016 16:12	Rochelle Y Jackson	1811965
	06/29/2016			06/29/2016 16:13	Rochelle Y Jackson	1811967
	06/29/2016			06/29/2016 16:14	Rochelle Y Jackson	1811968
	06/29/2016			06/29/2016 16:55	Rochelle Y Jackson	1811966
SM 2320 B-97	06/29/2016			07/07/2016	Dale L. Simmons	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
SM 2540 C-97	06/29/2016			07/01/2016	Yijie Li	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
SM 2540 D-97	06/29/2016			07/01/2016	Yijie Li	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
SM 4500 F-C-97	06/29/2016			07/07/2016	Dale L. Simmons	1811963, 1811964, 1811965, 1811966, 1811967, 1811968
SM 5310 B-00	06/29/2016			07/07/2016	Sofia Elnemr	1811969, 1811970, 1811971, 1811972, 1811973, 1811974