

Chemical Analysis Report

WQAP-2016-11-30-02

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

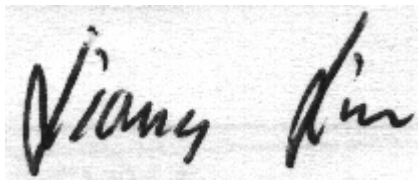
Event Description: **Lake Istokpoga**
Request ID: **RQ-2016-11-07-08**
Customer: **WQAP**
Project ID: **SPPROJECTS**

Send Reports to:
FL Dept. of Environmental Protection
2295 Victoria AVE
Suite 364
Fort Myers, FL 33901
Attn: Kirby Wolfe

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 21-DEC-2016 14:35

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: ISTOKPOGA ALGAE CENTER

Collection Date/Time: 11/29/2016 12:50

Field ID: G4SD0156

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852878	EPA 180.1 Rev. 2.0	Turbidity	4.3	A	NTU	P316182	
	SM 2120 B	Color (true)	120		PCU	P315980	
	SM 2540 D-97	TSS	9	I	mg/L	P316583	
1852884	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P316423	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P316480	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P316177	
	EPA 365.1 Rev. 2.0	Total-P	0.059		mg P/L	P316319	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315951	
1852890	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315943	

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: ISTOKPOGA ALGAE WEST

Collection Date/Time: 11/29/2016 11:05

Field ID: G4SD0155

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852879	EPA 180.1 Rev. 2.0	Turbidity	4.5		NTU	P316182	
	SM 2120 B	Color (true)	120		PCU	P315980	
	SM 2540 D-97	TSS	13		mg/L	P316583	
1852885	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P316423	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P316367	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P316177	
	EPA 365.1 Rev. 2.0	Total-P	0.055		mg P/L	P316250	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315951	
1852891	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315943	

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: ISTOKPOGA ALGAE NORTHWEST

Collection Date/Time: 11/29/2016 10:30

Field ID: G4SD0152

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852880	EPA 180.1 Rev. 2.0	Turbidity	5.7		NTU	P316182	
	SM 2120 B	Color (true)	110		PCU	P315980	
	SM 2540 D-97	TSS	12		mg/L	P316583	
1852886	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P316423	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P316367	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P316177	
	EPA 365.1 Rev. 2.0	Total-P	0.062		mg P/L	P316250	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315951	
1852892	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P315943	

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: ISTOKPOGA ALGAE NORTHEAST

Collection Date/Time: 11/29/2016 13:15

Field ID: G4SD0151

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852881	EPA 180.1 Rev. 2.0	Turbidity	4.7		NTU	P316182	
	SM 2120 B	Color (true)	130		PCU	P315980	
	SM 2540 D-97	TSS	12		mg/L	P316584	
1852887	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P316423	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P316480	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P316178	
	EPA 365.1 Rev. 2.0	Total-P	0.066		mg P/L	P316250	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315951	
1852893	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315943	

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: ISTOKPOGA ALGAE SOUTH

Collection Date/Time: 11/29/2016 11:45

Field ID: G4SD0153

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852882	EPA 180.1 Rev. 2.0	Turbidity	4.8		NTU	P316182	
	SM 2120 B	Color (true)	110		PCU	P315980	
	SM 2540 D-97	TSS	11		mg/L	P316584	
1852888	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P316423	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P316479	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P316178	
	EPA 365.1 Rev. 2.0	Total-P	0.059		mg P/L	P316252	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315951	
1852894	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315944	

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: ISTOKPOGA ALGAE SOUTHEAST

Collection Date/Time: 11/29/2016 12:15

Field ID: G4SD0154

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852883	EPA 180.1 Rev. 2.0	Turbidity	5.0		NTU	P316182	
	SM 2120 B	Color (true)	120		PCU	P315980	
	SM 2540 D-97	TSS	12		mg/L	P316584	
1852889	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P316423	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P316480	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P316178	
	EPA 365.1 Rev. 2.0	Total-P	0.056		mg P/L	P316252	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315951	
1852895	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315944	

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P316182

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316423

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316367

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316479

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316480

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316177

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316178

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316250

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316252

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
Batch ID: P316319

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315943

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315944

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

Reference Method: SM 2120 B
Batch ID: P315980

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2540 D-97
Batch ID: P316583

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P316584

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 5310 B-00
Batch ID: P315951

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316423

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316367

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
-----------	---------	---------	-----------	----------------

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316367

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316479

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316480

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: P316177

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316178

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316250

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316252

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316319

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315943

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315944

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

Reference Method: SM 5310 B-00
Batch ID: P315951

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316423

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852884	Ammonia-N	98.7	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316367

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852747	Kjeldahl Nitrogen	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316479

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852749	Kjeldahl Nitrogen	91.9	88.9	P/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852816	Kjeldahl Nitrogen	100	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316177

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852815	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316178

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852888	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316250

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
---------------	-----------	---------	---------	-----------	----------------

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316250

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852829	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316252

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852916	Total-P	101	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853660	Total-P	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315943

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852890	O-Phosphate-P	97.1	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315944

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1853007	O-Phosphate-P	102	103	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P315951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852523	Organic Carbon	95.7	94.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P316182

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852878	Turbidity	1.17	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316423

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852884	Ammonia-N	2.43	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316367

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852747	Kjeldahl Nitrogen	0.554	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316479

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852749	Kjeldahl Nitrogen	3.01	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852816	Kjeldahl Nitrogen	0.696	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852815	NO2NO3-N	0.937	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852888	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316250

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852829	Total-P	0.239	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852916	Total-P	2.63	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853660	Total-P	1.65	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315943

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852890	O-Phosphate-P	1.13	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315944

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1853007	O-Phosphate-P	0.681	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P315980

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852910	Color (true)	0.366	Sample	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P315951

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852523	Organic Carbon	0.773	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: A73092
Included Lab Sample IDs: 1852890, 1852891, 1852892, 1852893, 1852894, 1852895

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.7	98.4	P/P	90 - 110
O-Phosphate-P	99.7	99.7	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A73095
Included Lab Sample IDs: 1852884, 1852885, 1852886, 1852887, 1852888, 1852889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.3	96.8	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A73102
Included Lab Sample IDs: 1852878, 1852879, 1852880, 1852881, 1852882, 1852883

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	98.2	P/P	85 - 115

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A73166

Included Lab Sample IDs: 1852884, 1852885, 1852886, 1852887, 1852888, 1852889

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A73167

Included Lab Sample IDs: 1852878, 1852879, 1852880, 1852881, 1852882, 1852883

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	97.0	98.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73224

Included Lab Sample IDs: 1852885, 1852886, 1852887, 1852888, 1852889

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73238

Included Lab Sample IDs: 1852884, 1852885, 1852886, 1852887, 1852888, 1852889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.1	P/P	90 - 110
Ammonia-N	99.1	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73254

Included Lab Sample IDs: 1852884

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73272

Included Lab Sample IDs: 1852885, 1852886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73285

Included Lab Sample IDs: 1852884, 1852887, 1852888, 1852889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	96.0	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	MS
EPA 180.1 Rev. 2.0	Turbidity				1.17	
EPA 350.1 Rev. 2.0	Ammonia-N	104	98.7	101		2.43
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	102	101		0.554
	Kjeldahl Nitrogen	99.9	91.9	88.9		3.01
	Kjeldahl Nitrogen	101	100	101		0.696
	Kjeldahl Nitrogen	101	100	101		0.696
EPA 353.2 Rev. 2.0	NO2NO3-N	104	102			0.937
	NO2NO3-N	104	104	104		0.482
EPA 365.1 Rev. 2.0	Total-P	103	101	101		0.239
	Total-P	105	101	104		2.63
	Total-P	98.6	100	102		1.65
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	97.1	98.2		1.13
	O-Phosphate-P	101	102	103		0.681
SM 2120 B	Color (true)				0.366	
SM 5310 B-00	Organic Carbon	97.0	95.7	94.8		0.773

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1852878, 1852879, 1852880, 1852881, 1852882, 1852883
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1852884, 1852885, 1852886, 1852887, 1852888, 1852889
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1852884, 1852885, 1852886, 1852887, 1852888, 1852889
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1852884, 1852885, 1852886, 1852887, 1852888, 1852889
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1852884, 1852885, 1852886, 1852887, 1852888, 1852889
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1852890, 1852891, 1852892, 1852893, 1852894, 1852895
SM 2120 B / E31780	True Color measured at 450 nm	1852878, 1852879, 1852880, 1852881, 1852882, 1852883
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1852878, 1852879, 1852880, 1852881, 1852882, 1852883
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1852884, 1852885, 1852886, 1852887, 1852888, 1852889

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	11/30/2016			11/30/2016 16:14	Julie Michelle Frank	1852878, 1852879, 1852880, 1852881, 1852882, 1852883
EPA 350.1 Rev. 2.0	11/30/2016			12/07/2016	Sofia Elnemr	1852884, 1852885, 1852886, 1852887, 1852888, 1852889
EPA 351.2 Rev. 2.0	11/30/2016	12/08/2016	Adrian Shelby	12/09/2016	Joseph Suarez	1852885, 1852886
	11/30/2016	12/09/2016	Adrian Shelby	12/09/2016	Joseph Suarez	1852884, 1852887, 1852888, 1852889
EPA 353.2 Rev. 2.0	11/30/2016			12/05/2016	Beverly Y. Sanders	1852884, 1852885, 1852886, 1852887, 1852888, 1852889
EPA 365.1 Rev. 2.0	11/30/2016	12/06/2016	Vijayalakshmi Reddy	12/07/2016	Lipi Saha	1852885, 1852886, 1852887, 1852888, 1852889
	11/30/2016	12/07/2016	Vijayalakshmi Reddy	12/08/2016	Lipi Saha	1852884
EPA 365.1 Rev. 2.0 dissolved	11/30/2016			11/30/2016 15:32	Julia Storbeck	1852890
	11/30/2016			11/30/2016 16:11	Julia Storbeck	1852891
	11/30/2016			11/30/2016 16:12	Julia Storbeck	1852892
	11/30/2016			11/30/2016 16:13	Julia Storbeck	1852893
	11/30/2016			11/30/2016 16:14	Julia Storbeck	1852894
	11/30/2016			11/30/2016 16:15	Julia Storbeck	1852895
SM 2120 B	11/30/2016			11/30/2016 16:07	Jared I. Manley	1852878
	11/30/2016			11/30/2016 16:08	Jared I. Manley	1852879
	11/30/2016			11/30/2016 16:09	Jared I. Manley	1852880, 1852881
	11/30/2016			11/30/2016 16:10	Jared I. Manley	1852882
	11/30/2016			11/30/2016 16:11	Jared I. Manley	1852883
SM 2540 D-97	11/30/2016			12/01/2016	Yijie Li	1852878, 1852879, 1852880, 1852881, 1852882, 1852883
SM 5310 B-00	11/30/2016			11/30/2016	Julie Michelle Frank	1852884
	11/30/2016			12/01/2016	Julie Michelle Frank	1852885, 1852886, 1852887, 1852888, 1852889