

Chemical Analysis Report

WQAP-2016-10-10-01

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

Event Description: **Killearn Lakes Chain of Lakes**

Request ID: **RQ-2016-10-10-34**

Customer: **WQAP**

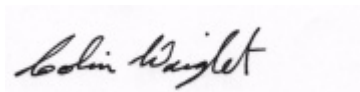
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
MS #3560
Tallahassee, FL 32399-2400
Attn: Benjamin Ralys

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: Colin Wright, Environmental Administrator

Date Certified: 02-NOV-2016 14:49

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular 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: Lower Dianne Lake Middle

Collection Date/Time: 10/10/2016 11:20

Field ID: G1WA0040_10102016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839308	EPA 180.1 Rev. 2.0	Turbidity	4.4	A	NTU	P312975	
	EPA 300.0 Rev. 2.1	Chloride	7.2		mg Cl/L	P313653	
	SM 2120 B	Color (true)	7.9		PCU	P312919	
	SM 2320 B-97	Total Alkalinity	23		mg CaCO3/L	P313057	
	SM 2540 C-97	TDS	51		mg/L	P313422	
	SM 2540 D-97	TSS	2	I	mg/L	P313430	
	SM 4500 F-C-97	Fluoride	0.061	I	mg F/L	P313060	
1839314	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P313473	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P313445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P313218	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P313752	
	SM 5310 B-00	Organic Carbon	5.7		mg C/L	P313092	
1839320	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312914	

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: Petty Gulf Lake Middle

Collection Date/Time: 10/10/2016 12:05

Field ID: G1WA0022_10102016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839309	EPA 180.1 Rev. 2.0	Turbidity	3.8		NTU	P312975	
	EPA 300.0 Rev. 2.1	Chloride	4.8		mg Cl/L	P313653	
	SM 2120 B	Color (true)	9.3		PCU	P312919	
	SM 2320 B-97	Total Alkalinity	18		mg CaCO3/L	P313058	
	SM 2540 C-97	TDS	28		mg/L	P313422	
	SM 2540 D-97	TSS	5	I	mg/L	P313430	
	SM 4500 F-C-97	Fluoride	0.053	I	mg F/L	P313061	
1839315	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P313473	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P313445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P313218	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P313752	
	SM 5310 B-00	Organic Carbon	5.4		mg C/L	P313092	
1839321	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312914	

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: Pine Hill Lake Middle

Collection Date/Time: 10/10/2016 12:25

Field ID: G1WA0054_10102016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839310	EPA 180.1 Rev. 2.0	Turbidity	4.0		NTU	P312975	
	EPA 300.0 Rev. 2.1	Chloride	5.8		mg Cl/L	P313653	
	SM 2120 B	Color (true)	9.3		PCU	P312919	
	SM 2320 B-97	Total Alkalinity	11		mg CaCO3/L	P313058	
	SM 2540 C-97	TDS	36		mg/L	P313422	

Field ID: G1WA0054_10102016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839310	SM 2540 D-97	TSS	3	I	mg/L	P313430	
	SM 4500 F-C-97	Fluoride	0.050	I	mg F/L	P313061	
1839316	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P313454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P313445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P313218	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P313752	
	SM 5310 B-00	Organic Carbon	5.8		mg C/L	P313092	
1839322	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312914	

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 Tom John Middle

Collection Date/Time: 10/10/2016 13:15

Field ID: G1WA0043_10102016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839311	EPA 180.1 Rev. 2.0	Turbidity	4.5		NTU	P312975	
	EPA 300.0 Rev. 2.1	Chloride	8.1		mg Cl/L	P313653	
	SM 2120 B	Color (true)	11		PCU	P312919	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P313058	
	SM 2540 C-97	TDS	35		mg/L	P313422	
	SM 2540 D-97	TSS	4	I	mg/L	P313430	
	SM 4500 F-C-97	Fluoride	0.055	I	mg F/L	P313061	
1839317	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P313454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P313445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P313218	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P313752	
	SM 5310 B-00	Organic Carbon	5.7		mg C/L	P313092	
1839323	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312914	

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 Monkey Business Middle

Collection Date/Time: 10/10/2016 09:30

Field ID: G1WA0036_10102016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839312	EPA 180.1 Rev. 2.0	Turbidity	5.6		NTU	P312975	
	EPA 300.0 Rev. 2.1	Chloride	6.1		mg Cl/L	P313653	
	SM 2120 B	Color (true)	11		PCU	P312919	
	SM 2320 B-97	Total Alkalinity	15		mg CaCO3/L	P313058	
	SM 2540 C-97	TDS	27		mg/L	P313422	
	SM 2540 D-97	TSS	6	I	mg/L	P313430	
	SM 4500 F-C-97	Fluoride	0.067	I	mg F/L	P313061	
1839318	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P313454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P313445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P313218	
	EPA 365.1 Rev. 2.0	Total-P	0.047		mg P/L	P313752	

Field ID: G1WA0036_10102016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839318	SM 5310 B-00	Organic Carbon	4.8		mg C/L	P313092	
1839324	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312914	

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 Monkey Business Middle DUP

Collection Date/Time: 10/10/2016 09:30

Field ID: G1WA0036D_10102016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839329	EPA 180.1 Rev. 2.0	Turbidity	5.6		NTU	P312975	
	EPA 300.0 Rev. 2.1	Chloride	6.1		mg Cl/L	P313653	
	SM 2120 B	Color (true)	11		PCU	P312919	
	SM 2320 B-97	Total Alkalinity	15		mg CaCO3/L	P313058	
	SM 2540 C-97	TDS	25		mg/L	P313422	
	SM 2540 D-97	TSS	7	I	mg/L	P313430	
	SM 4500 F-C-97	Fluoride	0.065	I	mg F/L	P313061	
1839330	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P313454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.69		mg N/L	P313445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P313218	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P313752	
	SM 5310 B-00	Organic Carbon	4.8		mg C/L	P313092	
1839331	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312915	

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 Monkey Business Middle

Collection Date/Time: 10/10/2016 09:10

Field ID: G1WA0036B_10102016

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839326	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P312975	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P313653	
	SM 2120 B	Color (true)	2.5	U	PCU	P312919	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P313058	
	SM 2540 C-97	TDS	15	U	mg/L	P313420	
	SM 2540 D-97	TSS	2	U	mg/L	P313428	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P313061	
1839327	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P313454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P313445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P313218	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P313752	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P313092	
1839328	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312915	

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: Upper Dianne Lake Middle

Collection Date/Time: 10/10/2016 10:15

Field ID: G1WA0041_10102016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1839313	EPA 180.1 Rev. 2.0	Turbidity	4.4		NTU	P312975	
	EPA 300.0 Rev. 2.1	Chloride	6.1		mg Cl/L	P313653	
	SM 2120 B	Color (true)	13		PCU	P312919	
	SM 2320 B-97	Total Alkalinity	11		mg CaCO3/L	P313058	
	SM 2540 C-97	TDS	21	I	mg/L	P313422	
	SM 2540 D-97	TSS	4	I	mg/L	P313430	
	SM 4500 F-C-97	Fluoride	0.068	I	mg F/L	P313061	
1839319	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P313454	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P313445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P313218	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P313752	
	SM 5310 B-00	Organic Carbon	5.0		mg C/L	P313092	
1839325	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312915	

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: P312975

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P313653

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P313454

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

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P313473

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P313445

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: P313218

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313752

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312914

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312915

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

Reference Method: SM 2120 B
Batch ID: P312919

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P313057

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

Reference Method: SM 2320 B-97
Batch ID: P313058

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

Reference Method: SM 2540 C-97
Batch ID: P313420

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P313422

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P313428

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P313430

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P313060

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P313061

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P313092

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: P313653

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P313454

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P313473

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P313445

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P313445

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313218

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313752

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312914

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312915

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

Reference Method: SM 2320 B-97
Batch ID: P313057

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

Reference Method: SM 2320 B-97
Batch ID: P313058

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P313060

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P313061

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.6		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P313092

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: P313653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839150	Chloride	98.9		P	90 - 110
1839206	Chloride	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P313454

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839316	Ammonia-N	96.6	98.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P313473

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839125	Ammonia-N	93.4	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P313445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839317	Kjeldahl Nitrogen	98.2	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313218

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839314	NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313752

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839314	Total-P	97.4	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312914

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839320	O-Phosphate-P	98.3	99.3	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839325	O-Phosphate-P	98.3	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P313060

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839635	Fluoride	102	102	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P313061

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839403	Fluoride	98.4	99.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P313092

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1839314	Organic Carbon	95.8	96.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P312975

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839308	Turbidity	2.53	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P313653

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839150	Chloride	0.217	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P313454

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839316	Ammonia-N	1.67	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P313473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839125	Ammonia-N	4.63	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P313445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839317	Kjeldahl Nitrogen	0.181	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P313218

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839314	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P313752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839314	Total-P	5.88	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839320	O-Phosphate-P	1.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839325	O-Phosphate-P	1.81	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P312919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839361	Color (true)	1.96	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P313057

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839635	Total Alkalinity	0.957	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P313058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839403	Total Alkalinity	0.331	Sample	P	0 - 4.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P313420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839090	TDS	7.79	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P313422

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839378	TDS	4.26	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P313060

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839635	Fluoride	0.477	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P313061

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839403	Fluoride	0.477	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P313092

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1839314	Organic Carbon	0.161	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: A72157
Included Lab Sample IDs: 1839320, 1839321, 1839322, 1839323, 1839324, 1839325, 1839328, 1839331

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.7	P/P	90 - 110
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	99.4	99.7	P/P	90 - 110
O-Phosphate-P	99.6	100	P/P	90 - 110
O-Phosphate-P	99.8	98.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A72158

Included Lab Sample IDs: 1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.4	100	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A72177

Included Lab Sample IDs: 1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329

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

Reference Method: SM 2320 B-97

Run ID: A72195

Included Lab Sample IDs: 1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	104	P/P	90 - 110
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A72195

Included Lab Sample IDs: 1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329

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

Reference Method: SM 5310 B-00

Run ID: A72203

Included Lab Sample IDs: 1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.9	99.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A72235

Included Lab Sample IDs: 1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A72305

Included Lab Sample IDs: 1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A72310

Included Lab Sample IDs: 1839316, 1839317, 1839318, 1839319, 1839327, 1839330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A72311

Included Lab Sample IDs: 1839314, 1839315

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.3	98.6	P/P	90 - 110
Ammonia-N	98.6	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A72386

Included Lab Sample IDs: 1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.4	98.0	P/P	90 - 110
Kjeldahl Nitrogen	99.3	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72422

Included Lab Sample IDs: 1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	100	P/P	90 - 110
Total-P	99.5	102	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					2.53	
EPA 300.0 Rev. 2.1	Chloride	101	98.9	97.1		0.217	
EPA 350.1 Rev. 2.0	Ammonia-N	103	96.6	98.5			1.67
	Ammonia-N	103	93.4	98.2			4.63
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	98.2	98.0			0.181
EPA 353.2 Rev. 2.0	NO2NO3-N	105	106	106			0.0
EPA 365.1 Rev. 2.0	Total-P	95.5	97.4	104			5.88
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	98.3	99.3			1.01
	O-Phosphate-P	102	98.3	100			1.81
SM 2120 B	Color (true)					1.96	
SM 2320 B-97	Total Alkalinity	103				0.957	
	Total Alkalinity	104				0.331	
SM 2540 C-97	TDS					7.79	
	TDS					4.26	
SM 4500 F-C-97	Fluoride	96.7	102	102			0.477

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
SM 4500 F-C-97	Fluoride	98.6	98.4	99.0		0.477
SM 5310 B-00	Organic Carbon	100	95.8	96.0		0.161

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1839320, 1839321, 1839322, 1839323, 1839324, 1839325, 1839328, 1839331
SM 2120 B / E31780	True Color measured at 450 nm	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330

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	10/10/2016			10/11/2016 15:51	Blanca Fach	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
EPA 300.0 Rev. 2.1	10/10/2016			10/21/2016	Ping Hua	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
EPA 350.1 Rev. 2.0	10/10/2016			10/18/2016	Sofia Elnemr	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330
EPA 351.2 Rev. 2.0	10/10/2016	10/19/2016	Adrian Shelby	10/21/2016	Joseph Suarez	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330
EPA 353.2 Rev. 2.0	10/10/2016			10/14/2016	Beverly Y. Sanders	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330
EPA 365.1 Rev. 2.0	10/10/2016	10/24/2016	Vijayalakshmi Reddy	10/25/2016	Lipi Saha	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330
EPA 365.1 Rev. 2.0 dissolved	10/10/2016			10/11/2016 14:08	Julia Storbeck	1839320
	10/10/2016			10/11/2016 14:12	Julia Storbeck	1839325
	10/10/2016			10/11/2016 14:36	Julia Storbeck	1839324, 1839331
	10/10/2016			10/11/2016 14:39	Julia Storbeck	1839328
	10/10/2016			10/11/2016 14:52	Julia Storbeck	1839322
	10/10/2016			10/11/2016 14:57	Julia Storbeck	1839323
	10/10/2016			10/11/2016 15:29	Julia Storbeck	1839321
	10/10/2016			10/11/2016 14:23	Julie Michelle Frank	1839308
	10/10/2016			10/11/2016 14:24	Julie Michelle Frank	1839309
	10/10/2016			10/11/2016 14:25	Julie Michelle Frank	1839310
	10/10/2016			10/11/2016 14:26	Julie Michelle Frank	1839311, 1839312
	10/10/2016			10/11/2016 14:27	Julie Michelle Frank	1839313
	10/10/2016			10/11/2016 14:28	Julie Michelle Frank	1839326
	10/10/2016			10/11/2016 14:29	Julie Michelle Frank	1839329
SM 2120 B	10/10/2016			10/13/2016	Dale L. Simmons	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
SM 2320 B-97	10/10/2016			10/12/2016	Yijie Li	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
SM 2540 C-97	10/10/2016			10/12/2016	Yijie Li	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
SM 2540 D-97	10/10/2016			10/13/2016	Dale L. Simmons	1839308, 1839309, 1839310, 1839311, 1839312, 1839313, 1839326, 1839329
SM 4500 F-C-97	10/10/2016			10/12/2016	Julie Michelle Frank	1839314, 1839315, 1839316, 1839317, 1839318, 1839319, 1839327, 1839330
SM 5310 B-00	10/10/2016					