

Chemical Analysis Report

WQAP-2016-03-29-01

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-2016-03-28-12**

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
Timothy W. Fitzpatrick
Liang-Tsair Lin, Ph.D.
Colin Wright, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 18-APR-2016 16:34

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: LAKE MONKEY BUSINESS MIDDLE

Collection Date/Time: 03/29/2016 09:00

Field ID: G1WA0036

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784232	EPA 180.1 Rev. 2.0	Turbidity	2.9	A	NTU	P301290	
	EPA 300.0 Rev. 2.1	Chloride	6.6	A	mg Cl/L	P301386	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	U	mg N/L	P301280	
	SM 2120 B	Color (true)	16		PCU	P301284	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P301699	
	SM 2540 C-97	TDS	34		mg/L	P301776	
	SM 2540 D-97	TSS	2	I	mg/L	P301787	
	SM 4500 F-C-97	Fluoride	0.067	I	mg F/L	P301704	
1784239	EPA 350.1 Rev. 2.0	Ammonia-N	0.041		mg N/L	P301687	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.40		mg N/L	P301947	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P301530	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P301650	
	SM 5310 B-00	Organic Carbon	4.0		mg C/L	P301501	
1784246	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301291	

Sample Location: UPPER DIANNE LAKE MIDDLE

Collection Date/Time: 03/29/2016 10:00

Field ID: G1WA0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784233	EPA 180.1 Rev. 2.0	Turbidity	3.9		NTU	P301290	
	EPA 300.0 Rev. 2.1	Chloride	6.3		mg Cl/L	P301386	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	U	mg N/L	P301280	
	SM 2120 B	Color (true)	22		PCU	P301284	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P301699	
	SM 2540 C-97	TDS	32		mg/L	P301776	
	SM 2540 D-97	TSS	2	I	mg/L	P301787	
	SM 4500 F-C-97	Fluoride	0.059	I	mg F/L	P301704	
1784240	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P301687	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P301947	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P301530	
	EPA 365.1 Rev. 2.0	Total-P	0.036		mg P/L	P301650	
	SM 5310 B-00	Organic Carbon	4.1		mg C/L	P301501	
1784247	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P301295	

Sample Location: LOWER DIANNE LAKE MIDDLE

Collection Date/Time: 03/29/2016 11:05

Field ID: G1WA0040

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784234	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P301290	
	EPA 300.0 Rev. 2.1	Chloride	8.1		mg Cl/L	P301386	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	U	mg N/L	P301280	
	SM 2120 B	Color (true)	16		PCU	P301284	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P301699	

Field ID: G1WA0040

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784234	SM 2540 C-97	TDS	38		mg/L	P301776	
	SM 2540 D-97	TSS	2	I	mg/L	P301787	
	SM 4500 F-C-97	Fluoride	0.058	I	mg F/L	P301704	
1784241	EPA 350.1 Rev. 2.0	Ammonia-N	0.043		mg N/L	P301687	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.42		mg N/L	P301947	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P301530	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P301650	
	SM 5310 B-00	Organic Carbon	4.2		mg C/L	P301501	
1784248	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301295	

Sample Location: PETTY GULF LAKE AT DEERLAKE RD. EAST **Collection Date/Time: 03/29/2016 11:45**

Field ID: G1WA0016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784235	EPA 180.1 Rev. 2.0	Turbidity	5.3		NTU	P301290	
	EPA 300.0 Rev. 2.1	Chloride	5.5		mg Cl/L	P301386	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	U	mg N/L	P301280	
	SM 2120 B	Color (true)	20		PCU	P301284	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P301699	
	SM 2540 C-97	TDS	29		mg/L	P301777	
	SM 2540 D-97	TSS	6	I	mg/L	P301788	
	SM 4500 F-C-97	Fluoride	0.047	I	mg F/L	P301704	
1784242	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P301687	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P301947	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P301530	
	EPA 365.1 Rev. 2.0	Total-P	0.041		mg P/L	P301650	
	SM 5310 B-00	Organic Carbon	6.1		mg C/L	P301501	
1784249	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301295	

Ref. Method and Comment:

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

Sample Location: PINE HILL LAKE MIDDLE **Collection Date/Time: 03/29/2016 12:10**

Field ID: G1WA0054

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784236	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P301290	
	EPA 300.0 Rev. 2.1	Chloride	6.3		mg Cl/L	P301386	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	U	mg N/L	P301280	
	SM 2120 B	Color (true)	20		PCU	P301284	
	SM 2320 B-97	Total Alkalinity	9.7		mg CaCO3/L	P301699	
	SM 2540 C-97	TDS	27		mg/L	P301777	
	SM 2540 D-97	TSS	2	U	mg/L	P301788	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P301704	
1784243	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P301687	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P301947	

Field ID: G1WA0054

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784243	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P301530	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P301650	
	SM 5310 B-00	Organic Carbon	5.2		mg C/L	P301501	
1784250	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301296	

Ref. Method and Comment:

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

Sample Location: LAKE TOM JOHN MIDDLE

Collection Date/Time: 03/29/2016 13:10

Field ID: G1WA0043

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784237	EPA 180.1 Rev. 2.0	Turbidity	1.0		NTU	P301290	
	EPA 300.0 Rev. 2.1	Chloride	8.4		mg Cl/L	P301386	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	U	mg N/L	P301280	
	SM 2120 B	Color (true)	21		PCU	P301284	
	SM 2320 B-97	Total Alkalinity	15		mg CaCO3/L	P301699	
	SM 2540 C-97	TDS	37		mg/L	P301777	
	SM 2540 D-97	TSS	2	I	mg/L	P301788	
	SM 4500 F-C-97	Fluoride	0.049	I	mg F/L	P301704	
1784244	EPA 350.1 Rev. 2.0	Ammonia-N	0.056		mg N/L	P301687	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P301976	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.010		mg N/L	P301530	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P301651	
	SM 5310 B-00	Organic Carbon	5.0		mg C/L	P301501	
1784251	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P301296	

Ref. Method and Comment:

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

Sample Location: KILLEARN CHAIN OF LAKES OUTLET AT VELDA DAIRY RD ACROSS FROM MINT HILL CT.

Collection Date/Time: 03/29/2016 14:00

Field ID: G1WA0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784238	EPA 180.1 Rev. 2.0	Turbidity	5.0		NTU	P301290	
	EPA 300.0 Rev. 2.1	Chloride	3.5		mg Cl/L	P301386	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	U	mg N/L	P301280	
	SM 2120 B	Color (true)	62		PCU	P301284	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P301699	
	SM 2540 C-97	TDS	33		mg/L	P301777	
	SM 2540 D-97	TSS	3	I	mg/L	P301788	
	SM 4500 F-C-97	Fluoride	0.052	I	mg F/L	P301704	
1784245	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P301687	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31		mg N/L	P301976	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P301530	
	EPA 365.1 Rev. 2.0	Total-P	0.081		mg P/L	P301651	
	SM 5310 B-00	Organic Carbon	4.6		mg C/L	P301501	

Field ID: G1WA0015

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1784252	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.031		mg P/L	P301296	

Ref. Method and Comment:

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: P301290

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P301386

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P301687

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P301947

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P301976

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

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P301280

Component	Result	Code	Units
Nitrite-N	0.003	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P301530

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

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P301650

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: P301651

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301291

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301295

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301296

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

Reference Method: SM 2120 B
Batch ID: P301284

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P301699

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P301776

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P301777

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P301787

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P301788

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P301704

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P301501

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: P301386

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301687

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301947

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301976

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Nitrite-N	95.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301530

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301530

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: P301650

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301651

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	94.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301291

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301295

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301296

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

Reference Method: SM 2320 B-97
Batch ID: P301699

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P301704

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

Reference Method: SM 5310 B-00
Batch ID: P301501

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301386

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784232	Chloride	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784245	Ammonia-N	98.5	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301947

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784240	Kjeldahl Nitrogen	90.1	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301976

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784278	Kjeldahl Nitrogen	89.7	94.2	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784232	Nitrite-N	97.8	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301530

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784242	NO2NO3-N	100	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301650

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784151	Total-P	93.4	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301651

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784244	Total-P	97.3	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784246	O-Phosphate-P	101	103	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301295

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784247	O-Phosphate-P	98.3	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784251	O-Phosphate-P	102	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P301704

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784318	Fluoride	96.3	97.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P301501

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1784239	Organic Carbon	95.2	94.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P301290

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784232	Turbidity	2.04	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P301386

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784232	Chloride	0.411	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301687

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784245	Ammonia-N	0.0563	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301947

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784240	Kjeldahl Nitrogen	11.5	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784278	Kjeldahl Nitrogen	4.37	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784232	Nitrite-N	0.679	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784242	NO2NO3-N	1.50	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784151	Total-P	1.96	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301651

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784244	Total-P	0.878	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784246	O-Phosphate-P	1.86	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301295

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784247	O-Phosphate-P	1.80	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P301296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784251	O-Phosphate-P	1.07	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P301284

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784276	Color (true)	2.46	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P301699

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784318	Total Alkalinity	1.08	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P301776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784064	TDS	4.24	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P301777

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784276	TDS	6.71	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P301787

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784064	TSS	7.41	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P301704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784318	Fluoride	0.990	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P301501

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1784239	Organic Carbon	1.00	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A68530

Included Lab Sample IDs: 1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238

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

Reference Method: SM 2120 B

Run ID: A68535

Included Lab Sample IDs: 1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.7	97.1	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A68538

Included Lab Sample IDs: 1784246, 1784247, 1784248, 1784249, 1784250, 1784251, 1784252

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	98.5	P/P	90 - 110
O-Phosphate-P	98.4	99.2	P/P	90 - 110
O-Phosphate-P	98.7	98.6	P/P	90 - 110
O-Phosphate-P	99.0	99.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A68539

Included Lab Sample IDs: 1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A68546

Included Lab Sample IDs: 1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238

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

Reference Method: SM 5310 B-00

Run ID: A68615

Included Lab Sample IDs: 1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.7	94.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A68624

Included Lab Sample IDs: 1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A68662

Included Lab Sample IDs: 1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	99.5	P/P	90 - 110
Ammonia-N	99.5	99.8	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A68687

Included Lab Sample IDs: 1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	100	P/P	90 - 110
Total Alkalinity	99.5	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A68687

Included Lab Sample IDs: 1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	99.1	P/P	90 - 110
Fluoride	99.1	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A68725

Included Lab Sample IDs: 1784239, 1784240, 1784241, 1784242, 1784243, 1784244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	98.8	P/P	90 - 110
Total-P	98.8	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A68797

Included Lab Sample IDs: 1784245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.6	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A68819

Included Lab Sample IDs: 1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	99.0	P/P	90 - 110
Kjeldahl Nitrogen	98.0	101	P/P	90 - 110
Kjeldahl Nitrogen	99.0	98.0	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	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					2.04	
EPA 300.0 Rev. 2.1	Chloride	103	104			0.411	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	98.5	98.4			0.0563
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	92.6	90.1	105			11.5
	Kjeldahl Nitrogen	97.0	89.7	94.2			4.37
EPA 353.2 Rev. 2.0	Nitrite-N	95.2	97.8	98.5			0.679
	NO2NO3-N	100	100	99.0			1.50
EPA 365.1 Rev. 2.0	Total-P	102	93.4	95.8			1.96
	Total-P	94.1	97.3	96.4			0.878
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	101	103			1.86
	O-Phosphate-P	103	98.3	100			1.80
	O-Phosphate-P	101	102	103			1.07
SM 2120 B	Color (true)					2.46	
SM 2320 B-97	Total Alkalinity	103				1.08	
SM 2540 C-97	TDS					4.24	
	TDS					6.71	
SM 2540 D-97	TSS					7.41	
SM 4500 F-C-97	Fluoride	96.7	96.3	97.5			0.990
SM 5310 B-00	Organic Carbon	95.0	95.2	94.1			1.00

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245
EPA 353.2 Rev. 2.0 / E31780	Nitrite in aqueous matrices as mg N/L	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1784246, 1784247, 1784248, 1784249, 1784250, 1784251, 1784252
SM 2120 B / E31780	True Color measured at 450 nm	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245

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	03/29/2016	04/11/2016	Sofia Elnemr	03/30/2016 14:45	Sima Feizi	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
EPA 300.0 Rev. 2.1	03/29/2016			04/01/2016	Ping Hua	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
EPA 350.1 Rev. 2.0	03/29/2016			04/05/2016	Diana M. Turner	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245
EPA 351.2 Rev. 2.0	03/29/2016			04/12/2016	Christopher Armour	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245
EPA 353.2 Rev. 2.0	03/29/2016			03/30/2016 13:31	Virginia P. Brown	1784232
	03/29/2016			03/30/2016 13:34	Virginia P. Brown	1784233
	03/29/2016			03/30/2016 13:35	Virginia P. Brown	1784234
	03/29/2016			03/30/2016 13:37	Virginia P. Brown	1784235
	03/29/2016	04/06/2016	Christopher Armour	03/30/2016 13:38	Virginia P. Brown	1784236
	03/29/2016			03/30/2016 13:39	Virginia P. Brown	1784237
	03/29/2016			03/30/2016 13:40	Virginia P. Brown	1784238
	03/29/2016			04/04/2016	Diana M. Turner	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245
EPA 365.1 Rev. 2.0	03/29/2016			04/07/2016	Lipi Saha	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245
EPA 365.1 Rev. 2.0 dissolved	03/29/2016			03/30/2016 12:05	Julia Storbeck	1784246
	03/29/2016			03/30/2016 12:10	Julia Storbeck	1784247
	03/29/2016			03/30/2016 12:34	Julia Storbeck	1784248
	03/29/2016			03/30/2016 12:35	Julia Storbeck	1784249
	03/29/2016			03/30/2016 12:36	Julia Storbeck	1784250
	03/29/2016			03/30/2016 13:09	Julia Storbeck	1784251
	03/29/2016			03/30/2016 13:35	Julia Storbeck	1784252
SM 2120 B	03/29/2016	03/29/2016		03/30/2016 13:19	Blanca Fach	1784232
	03/29/2016			03/30/2016 13:20	Blanca Fach	1784233
	03/29/2016			03/30/2016 13:21	Blanca Fach	1784234, 1784235
	03/29/2016			03/30/2016 13:22	Blanca Fach	1784236
	03/29/2016			03/30/2016 13:23	Blanca Fach	1784237
	03/29/2016			03/30/2016 13:24	Blanca Fach	1784238
SM 2320 B-97	03/29/2016			04/05/2016	Dale L. Simmons	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
SM 2540 C-97	03/29/2016			04/01/2016	Yijie Li	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
SM 2540 D-97	03/29/2016	03/29/2016		04/01/2016	Yijie Li	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
SM 4500 F-C-97	03/29/2016			04/05/2016	Dale L. Simmons	1784232, 1784233, 1784234, 1784235, 1784236, 1784237, 1784238
SM 5310 B-00	03/29/2016			04/01/2016	Sofia Elnemr	1784239, 1784240, 1784241, 1784242, 1784243, 1784244, 1784245