

Chemical Analysis Report

WQAP-2017-03-23-03

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

Event Description: **SMP 2016 Freshwater Kit A**
Request ID: **RQ-2017-03-20-29**
Customer: **WQAP**
Project ID: **SMP**

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

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 17-APR-2017 10:39

A handwritten signature in black ink, appearing to read "Liang Lin", is written on a light-colored, textured 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: Little River @ Wacissa

Collection Date/Time: 03/23/2017 10:15

Field ID: G1TLHR0008-2017-01

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1882883	EPA 180.1 Rev. 2.0	Turbidity	0.40		NTU	P322150	
	EPA 300.0 Rev. 2.1	Chloride	5.9		mg Cl/L	P322559	
	SM 2120 B	Color (true)	3.8	I	PCU	P322161	
	SM 2320 B-97	Total Alkalinity	154		mg CaCO3/L	P322480	
	SM 2540 C-97	TDS	168		mg/L	P322731	
	SM 2540 D-97	TSS	2	I	mg/L	P322715	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P322483	
1882888	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P322191	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.18	I	mg N/L	P322202	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.21		mg N/L	P322238	
	EPA 365.1 Rev. 2.0	Total-P	0.045		mg P/L	P322228	
	SM 5310 B-00	Organic Carbon	0.67	I	mg C/L	P322210	
1882893	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.039		mg P/L	P322172	

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: Owens Spring @ Suwannee River

Collection Date/Time: 03/23/2017 12:20

Field ID: G1TLHR0036-2017-01

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1882884	EPA 180.1 Rev. 2.0	Turbidity	0.20		NTU	P322150	
	EPA 300.0 Rev. 2.1	Chloride	9.7		mg Cl/L	P322656	
	SM 2120 B	Color (true)	3.2	I	PCU	P322161	
	SM 2320 B-97	Total Alkalinity	183		mg CaCO3/L	P322480	
	SM 2540 C-97	TDS	234		mg/L	P322731	
	SM 2540 D-97	TSS	2	I	mg/L	P322715	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P322483	
1882889	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P322191	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.14	I	mg N/L	P322202	
	EPA 353.2 Rev. 2.0	NO2NO3-N	5.8		mg N/L	P322238	
	EPA 365.1 Rev. 2.0	Total-P	0.043		mg P/L	P322228	
	SM 5310 B-00	Organic Carbon	1.0		mg C/L	P322210	
1882894	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.040		mg P/L	P322172	

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: Running Spring @ Suwannee River

Collection Date/Time: 03/23/2017 13:15

Field ID: G1TLHR0026-2017-01

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1882885	EPA 180.1 Rev. 2.0	Turbidity	0.10		NTU	P322150	
	EPA 300.0 Rev. 2.1	Chloride	6.3		mg Cl/L	P322487	
	SM 2120 B	Color (true)	2.5	U	PCU	P322161	
	SM 2320 B-97	Total Alkalinity	187	A	mg CaCO3/L	P322242	
	SM 2540 C-97	TDS	220		mg/L	P322731	

Field ID: G1TLHR0026-2017-01

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1882885	SM 2540 D-97	TSS	2	U	mg/L	P322715	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P322246	
1882890	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P322191	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.088	I	mg N/L	P322202	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.9		mg N/L	P322238	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P322228	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P322210	
1882895	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.037		mg P/L	P322172	

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: Peacock Spring @ Suwannee River

Collection Date/Time: 03/23/2017 14:00

Field ID: G1TLHR0050-2017-01

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1882886	EPA 180.1 Rev. 2.0	Turbidity	0.50		NTU	P322150	
	EPA 300.0 Rev. 2.1	Chloride	6.4		mg Cl/L	P322559	
	SM 2120 B	Color (true)	2.5	U	PCU	P322161	
	SM 2320 B-97	Total Alkalinity	185	A	mg CaCO3/L	P322481	
	SM 2540 C-97	TDS	224		mg/L	P322731	
	SM 2540 D-97	TSS	3	I	mg/L	P322716	
	SM 4500 F-C-97	Fluoride	0.18		mg F/L	P322484	
1882891	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P322251	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.15	I	mg N/L	P322204	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.9		mg N/L	P322238	
	EPA 365.1 Rev. 2.0	Total-P	0.045		mg P/L	P322228	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P322210	
1882896	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.040		mg P/L	P322172	

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: Charles Spring @ Suwannee River

Collection Date/Time: 03/23/2017 14:40

Field ID: G1TLHR0021-2017-01

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1882887	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P322150	
	EPA 300.0 Rev. 2.1	Chloride	6.5		mg Cl/L	P322559	
	SM 2120 B	Color (true)	7.3		PCU	P322161	
	SM 2320 B-97	Total Alkalinity	168		mg CaCO3/L	P322481	
	SM 2540 C-97	TDS	214	A	mg/L	P322732	
	SM 2540 D-97	TSS	3	I	mg/L	P322716	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P322484	
1882892	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P322251	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P322204	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.8		mg N/L	P322238	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P322228	

Field ID: G1TLHR0021-2017-01

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1882892	SM 5310 B-00	Organic Carbon	1.8		mg C/L	P322210	
1882897	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P322172	

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: P322150

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322487

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322559

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322656

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322191

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322251

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322202

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322204

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: P322238

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322228

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322172

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

Reference Method: SM 2120 B
Batch ID: P322161

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P322242

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

Reference Method: SM 2320 B-97
Batch ID: P322480

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

Reference Method: SM 2320 B-97
Batch ID: P322481

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

Reference Method: SM 2540 C-97
Batch ID: P322731

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P322732

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P322715

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P322716

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P322246

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P322483

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P322484

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P322210

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: P322487

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322559

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322656

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322656

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322191

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322251

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322202

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	109		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322204

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322238

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322228

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322172

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

Reference Method: SM 2320 B-97
Batch ID: P322242

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	95 - 108

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P322480

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

Reference Method: SM 2320 B-97
Batch ID: P322481

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	106		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P322246

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.3		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P322483

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

Reference Method: SM 4500 F-C-97
Batch ID: P322484

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P322210

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1881984	Chloride	98.1		P	90 - 110
1882053	Chloride	97.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882697	Chloride	102		P	90 - 110
1882908	Chloride	99.4		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P322656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883144	Chloride	101		P	90 - 110
1883323	Chloride	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882352	Ammonia-N	99.0	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322251

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883124	Ammonia-N	99.1	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322202

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882767	Kjeldahl Nitrogen	97.9	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322204

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882961	Kjeldahl Nitrogen	99.3	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322238

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882888	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322228

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882888	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882893	O-Phosphate-P	95.6	97.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P322246

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882885	Fluoride	99.1	99.1	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
 Batch ID: P322483

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882334	Fluoride	102	105	P/P	91 - 105

Reference Method: SM 4500 F-C-97
 Batch ID: P322484

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882886	Fluoride	102	104	P/P	91 - 105

Reference Method: SM 5310 B-00
 Batch ID: P322210

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1882602	Organic Carbon	98.0	99.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P322150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882920	Turbidity	2.61	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P322487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1881984	Chloride	0.0129	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P322559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882908	Chloride	0.205	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P322656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883323	Chloride	0.287	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P322191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882352	Ammonia-N	3.40	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322251

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883124	Ammonia-N	0.0157	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322202

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882767	Kjeldahl Nitrogen	7.81	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322204

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882961	Kjeldahl Nitrogen	0.607	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322238

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882888	NO2NO3-N	0.968	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322228

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882888	Total-P	0.299	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882893	O-Phosphate-P	1.26	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P322161

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882937	Color (true)	1.25	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P322242

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882885	Total Alkalinity	3.04	Sample	P	0 - 4.8

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P322480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882334	Total Alkalinity	0.0435	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P322481

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882886	Total Alkalinity	2.69	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P322731

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882566	TDS	5.16	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P322732

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882887	TDS	2.80	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P322246

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882885	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P322483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882334	Fluoride	2.39	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P322484

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882886	Fluoride	1.41	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P322210

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1882602	Organic Carbon	0.910	Spike	P	0 - 20

Quality Assurance Report Precision

* 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 180.1 Rev. 2.0

Run ID: A75338

Included Lab Sample IDs: 1882883, 1882884, 1882885, 1882886, 1882887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A75344

Included Lab Sample IDs: 1882883, 1882884, 1882885, 1882886, 1882887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	102	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A75348

Included Lab Sample IDs: 1882893, 1882894, 1882895, 1882896, 1882897

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	97.9	P/P	90 - 110
O-Phosphate-P	99.1	100	P/P	90 - 110
O-Phosphate-P	99.3	98.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A75351

Included Lab Sample IDs: 1882888, 1882889, 1882890

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	98.3	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A75367

Included Lab Sample IDs: 1882888, 1882889, 1882890, 1882891, 1882892

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.8	99.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A75375

Included Lab Sample IDs: 1882888, 1882889, 1882890, 1882891, 1882892

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A75378
Included Lab Sample IDs: 1882885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	105	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A75378
Included Lab Sample IDs: 1882885

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	96.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A75380
Included Lab Sample IDs: 1882891, 1882892

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A75404
Included Lab Sample IDs: 1882888, 1882889, 1882890, 1882891, 1882892

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	105	P/P	90 - 110
Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A75466
Included Lab Sample IDs: 1882883, 1882884, 1882886, 1882887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	105	P/P	90 - 110
Total Alkalinity	105	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A75466
Included Lab Sample IDs: 1882883, 1882884, 1882886, 1882887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	104	P/P	90 - 110
Fluoride	103	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A75467
Included Lab Sample IDs: 1882885

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75468

Included Lab Sample IDs: 1882888, 1882889, 1882890, 1882891, 1882892

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A75488

Included Lab Sample IDs: 1882883, 1882884, 1882886, 1882887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Chloride	102	102	P/P	90 - 110
Chloride	102	101	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				2.61	
EPA 300.0 Rev. 2.1	Chloride	101	98.1 97.2		0.0129	
	Chloride	102	99.4 102		0.205	
	Chloride	102	100 101		0.287	
EPA 350.1 Rev. 2.0	Ammonia-N	102	99.0 102			3.40
	Ammonia-N	107	99.1 99.1			0.0157
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109	97.9 107			7.81
	Kjeldahl Nitrogen	104	99.3 100			0.607
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101 102			0.968
EPA 365.1 Rev. 2.0	Total-P	101	106 106			0.299
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	95.6 97.3			1.26
SM 2120 B	Color (true)				1.25	
SM 2320 B-97	Total Alkalinity	105			3.04	
	Total Alkalinity	104			0.0435	
	Total Alkalinity	106			2.69	
SM 2540 C-97	TDS				5.16	
	TDS				2.80	
SM 4500 F-C-97	Fluoride	95.3	99.1 99.1			0.0
	Fluoride	98.2	102 105			2.39
	Fluoride	100	102 104			1.41
SM 5310 B-00	Organic Carbon	99.8	98.0 99.4			0.910

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1882883, 1882884, 1882885, 1882886, 1882887
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1882883, 1882884, 1882885, 1882886, 1882887

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1882888, 1882889, 1882890, 1882891, 1882892
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1882888, 1882889, 1882890, 1882891, 1882892
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1882888, 1882889, 1882890, 1882891, 1882892
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1882888, 1882889, 1882890, 1882891, 1882892
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1882893, 1882894, 1882895, 1882896, 1882897
SM 2120 B / E31780	True Color measured at 450 nm	1882883, 1882884, 1882885, 1882886, 1882887
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1882883, 1882884, 1882885, 1882886, 1882887
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1882883, 1882884, 1882885, 1882886, 1882887
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1882883, 1882884, 1882885, 1882886, 1882887
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1882883, 1882884, 1882885, 1882886, 1882887
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1882888, 1882889, 1882890, 1882891, 1882892

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	03/23/2017			03/24/2017 15:35	Sima Feizi	1882883, 1882884, 1882885, 1882886, 1882887
EPA 300.0 Rev. 2.1	03/23/2017			03/30/2017	Ping Hua	1882883, 1882885
	03/23/2017			03/31/2017	Ping Hua	1882884, 1882886, 1882887
EPA 350.1 Rev. 2.0	03/23/2017			03/24/2017	Julie Michelle Frank	1882888, 1882889, 1882890
	03/23/2017			03/27/2017	Julie Michelle Frank	1882891, 1882892
EPA 351.2 Rev. 2.0	03/23/2017	03/27/2017	Adrian Shelby	03/28/2017	Joseph Suarez	1882888, 1882889, 1882890, 1882891, 1882892
EPA 353.2 Rev. 2.0	03/23/2017			03/27/2017	Beverly Y. Sanders	1882888, 1882889, 1882890, 1882891, 1882892
EPA 365.1 Rev. 2.0	03/23/2017	03/27/2017	Vijayalakshmi Reddy	03/30/2017	Virginia P. Brown	1882888, 1882889, 1882890, 1882891, 1882892
EPA 365.1 Rev. 2.0 dissolved	03/23/2017			03/24/2017 16:20	Anthony C. Onicha	1882893
	03/23/2017			03/24/2017 16:44	Anthony C. Onicha	1882894
	03/23/2017			03/24/2017 16:45	Anthony C. Onicha	1882895
	03/23/2017			03/24/2017 16:46	Anthony C. Onicha	1882896
	03/23/2017			03/24/2017 17:11	Anthony C. Onicha	1882897
SM 2120 B	03/23/2017			03/24/2017 16:06	Julia Storbeck	1882883
	03/23/2017			03/24/2017 16:07	Julia Storbeck	1882884, 1882885
	03/23/2017			03/24/2017 16:08	Julia Storbeck	1882886
	03/23/2017			03/24/2017 16:09	Julia Storbeck	1882887
SM 2320 B-97	03/23/2017			03/25/2017	Dale L. Simmons	1882885
	03/23/2017			03/30/2017	Dale L. Simmons	1882883, 1882884, 1882886, 1882887
SM 2540 C-97	03/23/2017			03/28/2017	Yijie Li	1882883, 1882884, 1882885, 1882886, 1882887
SM 2540 D-97	03/23/2017			03/28/2017	Yijie Li	1882883, 1882884, 1882885, 1882886, 1882887
SM 4500 F-C-97	03/23/2017			03/25/2017	Dale L. Simmons	1882885
	03/23/2017			03/30/2017	Dale L. Simmons	1882883, 1882884, 1882886, 1882887
SM 5310 B-00	03/23/2017			03/24/2017	Julie Michelle Frank	1882888, 1882889, 1882890, 1882891, 1882892