Chemical Analysis Report

WQAP-2017-07-25-08

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-2017-06-26-38**
Customer: **WQAP**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 09-AUG-2017 14:17

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: 07/25/2017 09:50**

Field ID: G1TLHR0008-2017-02 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1916229	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P329160	
	EPA 300.0 Rev. 2.1	Chloride	5.7		mg Cl/L	P329192	
	SM 2120 B	Color (true)	3.3	I	PCU	P329077	
	SM 2320 B-97	Total Alkalinity	149		mg CaCO3/L	P329382	
	SM 2540 C-97	TDS	163		mg/L	P329473	
	SM 2540 D-97	TSS	2	U	mg/L	P329781	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P329384	
1916234	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P329231	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.14	I	mg N/L	P329175	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.28		mg N/L	P329323	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P329225	
	SM 5310 B-00	Organic Carbon	0.84	I	mg C/L	P329396	
1916239	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.039		mg P/L	P329158	

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: Fenholloway River @ US 27 **Collection Date/Time: 07/25/2017 11:20**

Field ID: G1TLHR0002-2017-02 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1916230	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P329160	
	EPA 300.0 Rev. 2.1	Chloride	5.7		mg Cl/L	P329192	
	SM 2120 B	Color (true)	940		PCU	P329077	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P329383	
	SM 2540 C-97	TDS	157		mg/L	P329473	
	SM 2540 D-97	TSS	2	I	mg/L	P329781	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P329385	
1916235	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P329231	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P329175	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P329323	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P329225	
	SM 5310 B-00	Organic Carbon	84		mg C/L	P329396	
1916240	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P329158	

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: 07/25/2017 13:00**

Field ID: G1TLHR0026-2017-03 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1916231	EPA 180.1 Rev. 2.0	Turbidity	0.15		NTU	P329160	
	EPA 300.0 Rev. 2.1	Chloride	6.2		mg Cl/L	P329192	
	SM 2120 B	Color (true)	2.5	U	PCU	P329077	
	SM 2320 B-97	Total Alkalinity	181	A	mg CaCO3/L	P329383	
	SM 2540 C-97	TDS	232		mg/L	P329473	

Field ID: G1TLHR0026-2017-03 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1916231	SM 2540 D-97	TSS	2	I	mg/L	P329781	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P329385	
1916236	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P329231	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.18	I	mg N/L	P329175	
	EPA 353.2 Rev. 2.0	NO2NO3-N	3.2		mg N/L	P329323	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P329225	
	SM 5310 B-00	Organic Carbon	0.56	I	mg C/L	P329396	
1916241	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.032		mg P/L	P329158	

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: 07/25/2017 14:00**

Field ID: G1TLHR0050-2017-04 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1916232	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P329160	
	EPA 300.0 Rev. 2.1	Chloride	6.3		mg Cl/L	P329192	
	SM 2120 B	Color (true)	13		PCU	P329077	
	SM 2320 B-97	Total Alkalinity	162		mg CaCO3/L	P329383	
	SM 2540 C-97	TDS	205		mg/L	P329474	
	SM 2540 D-97	TSS	2	I	mg/L	P329782	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P329385	
1916237	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P329231	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P329175	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P329324	
	EPA 365.1 Rev. 2.0	Total-P	0.040		mg P/L	P329411	
	SM 5310 B-00	Organic Carbon	2.6		mg C/L	P329396	
1916242	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P329158	

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: 07/25/2017 14:45**

Field ID: G1TLHR0021-2017-04 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1916233	EPA 180.1 Rev. 2.0	Turbidity	0.30		NTU	P329160	
	EPA 300.0 Rev. 2.1	Chloride	6.5		mg Cl/L	P329192	
	SM 2120 B	Color (true)	2.7	I	PCU	P329077	
	SM 2320 B-97	Total Alkalinity	160		mg CaCO3/L	P329383	
	SM 2540 C-97	TDS	216	A	mg/L	P329474	
	SM 2540 D-97	TSS	3	IA	mg/L	P329782	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P329385	
1916238	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P329231	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.20		mg N/L	P329175	
	EPA 353.2 Rev. 2.0	NO2NO3-N	4.1		mg N/L	P329324	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P329411	

Field ID: G1TLHR0021-2017-04 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1916238	SM 5310 B-00	Organic Carbon	0.89	I	mg C/L	P329396	
1916243	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.041		mg P/L	P329158	

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: P329160

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P329192

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P329231

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P329175

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P329323

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P329324

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P329225

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P329411

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 dissolved
Batch ID: P329158

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

Reference Method: SM 2120 B
Batch ID: P329077

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P329382

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

Reference Method: SM 2320 B-97
Batch ID: P329383

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

Reference Method: SM 2540 C-97
Batch ID: P329473

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P329474

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P329781

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P329782

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P329384

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P329385

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P329396

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: P329192

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P329231

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P329175

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P329323

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P329324

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: P329225

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P329411

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P329411

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P329158

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.4		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P329382

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

Reference Method: SM 2320 B-97
Batch ID: P329383

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

Reference Method: SM 4500 F-C-97
Batch ID: P329384

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	93.5		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P329385

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.4		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P329396

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P329192

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916191	Chloride	95.8		P	90 - 110
1916193	Chloride	94.2		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P329231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916196	Ammonia-N	105	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P329175

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916447	Kjeldahl Nitrogen	91.4	97.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P329323

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916235	NO2NO3-N	91.1	90.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P329324

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916237	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P329225

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916196	Total-P	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P329411

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916237	Total-P	95.0	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P329158

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916199	O-Phosphate-P	95.2	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P329384

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916219	Fluoride	95.5	96.1	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P329385

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916231	Fluoride	95.2	97.2	P/P	91 - 105

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P329396

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1916196	Organic Carbon	93.0	93.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P329160

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916191	Turbidity	2.94	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P329192

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916191	Chloride	3.38	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P329231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916196	Ammonia-N	1.17	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P329175

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916447	Kjeldahl Nitrogen	5.27	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P329323

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916235	NO2NO3-N	1.10	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P329324

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916237	NO2NO3-N	0.254	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P329225

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916196	Total-P	0.361	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P329411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916237	Total-P	0.790	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P329158

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916199	O-Phosphate-P	2.08	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P329077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916191	Color (true)	3.50	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P329382

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916219	Total Alkalinity	0.975	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P329383

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916231	Total Alkalinity	0.286	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P329473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916194	TDS	7.31	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P329474

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916233	TDS	4.16	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P329384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916219	Fluoride	0.484	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P329385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916231	Fluoride	1.45	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P329396

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1916196	Organic Carbon	0.665	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: SM 2120 B
Run ID: A77938
Included Lab Sample IDs: 1916229, 1916230, 1916231, 1916232, 1916233

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A77948
Included Lab Sample IDs: 1916229, 1916230, 1916231, 1916232, 1916233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.8	P/P	90 - 110
Chloride	99.8	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A77968
Included Lab Sample IDs: 1916239, 1916240, 1916241, 1916242, 1916243

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	98.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A77969
Included Lab Sample IDs: 1916229, 1916230, 1916231, 1916232, 1916233

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A77969
Included Lab Sample IDs: 1916229, 1916230, 1916231, 1916232, 1916233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.5	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A77993
Included Lab Sample IDs: 1916234, 1916235, 1916236, 1916237, 1916238

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A78018
Included Lab Sample IDs: 1916234, 1916235, 1916236, 1916237, 1916238

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A78022
Included Lab Sample IDs: 1916234, 1916236

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

Reference Method: SM 2320 B-97
Run ID: A78044
Included Lab Sample IDs: 1916229, 1916230, 1916231, 1916232, 1916233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	100	P/P	90 - 110
Total Alkalinity	99.7	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A78044
Included Lab Sample IDs: 1916229, 1916230, 1916231, 1916232, 1916233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	95.2	96.6	P/P	90 - 110
Fluoride	96.1	95.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A78047
Included Lab Sample IDs: 1916234, 1916235, 1916236, 1916237, 1916238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.0	97.8	P/P	90 - 110
Kjeldahl Nitrogen	98.5	95.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A78049
Included Lab Sample IDs: 1916235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A78052
Included Lab Sample IDs: 1916234, 1916235, 1916236, 1916237, 1916238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.8	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A78080
Included Lab Sample IDs: 1916237, 1916238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	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					2.94	
EPA 300.0 Rev. 2.1	Chloride	97.6	95.8	94.2		3.38	
EPA 350.1 Rev. 2.0	Ammonia-N	104	105	104			1.17
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.2	91.4	97.7			5.27
EPA 353.2 Rev. 2.0	NO2NO3-N	102	91.1	90.1			1.10
	NO2NO3-N	105	104	104			0.254
EPA 365.1 Rev. 2.0	Total-P	98.2	101	100			0.361
	Total-P	96.4	95.0	95.8			0.790
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	95.2	97.2			2.08
SM 2120 B	Color (true)					3.50	
SM 2320 B-97	Total Alkalinity	102				0.975	
	Total Alkalinity	102				0.286	
SM 2540 C-97	TDS					7.31	
	TDS					4.16	
SM 4500 F-C-97	Fluoride	93.5	95.5	96.1			0.484
	Fluoride	94.4	95.2	97.2			1.45
SM 5310 B-00	Organic Carbon	99.6	93.0	93.8			0.665

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1916229, 1916230, 1916231, 1916232, 1916233
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1916229, 1916230, 1916231, 1916232, 1916233

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1916234, 1916235, 1916236, 1916237, 1916238
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1916234, 1916235, 1916236, 1916237, 1916238
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1916234, 1916235, 1916236, 1916237, 1916238
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1916234, 1916235, 1916236, 1916237, 1916238
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1916239, 1916240, 1916241, 1916242, 1916243
SM 2120 B / E31780	True Color measured at 450 nm	1916229, 1916230, 1916231, 1916232, 1916233
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1916229, 1916230, 1916231, 1916232, 1916233
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1916229, 1916230, 1916231, 1916232, 1916233
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1916229, 1916230, 1916231, 1916232, 1916233
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1916229, 1916230, 1916231, 1916232, 1916233
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1916234, 1916235, 1916236, 1916237, 1916238

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	07/25/2017			07/26/2017 15:19	DeAsia Armster	1916229, 1916230, 1916231, 1916232, 1916233
EPA 300.0 Rev. 2.1	07/25/2017			07/26/2017	Julia Storbeck	1916229, 1916230, 1916231, 1916232, 1916233
EPA 350.1 Rev. 2.0	07/25/2017			07/26/2017	Sofia Elnemr	1916234, 1916235, 1916236, 1916237, 1916238
EPA 351.2 Rev. 2.0	07/25/2017	07/27/2017	Adrian Shelby	07/28/2017	Tanya Welborn	1916234, 1916235, 1916236, 1916237, 1916238
EPA 353.2 Rev. 2.0	07/25/2017			07/28/2017	Beverly Y. Sanders	1916234, 1916235, 1916236, 1916237, 1916238
EPA 365.1 Rev. 2.0	07/25/2017	07/27/2017	Adrian Shelby	07/28/2017	Lipi Saha	1916234, 1916235, 1916236
	07/25/2017	07/31/2017	Adrian Shelby	08/01/2017	Lipi Saha	1916237, 1916238
EPA 365.1 Rev. 2.0 dissolved	07/25/2017			07/26/2017 14:53	Ping Hua	1916239, 1916240
	07/25/2017			07/26/2017 14:54	Ping Hua	1916241
	07/25/2017			07/26/2017 14:55	Ping Hua	1916242
	07/25/2017			07/26/2017 14:56	Ping Hua	1916243
SM 2120 B	07/25/2017			07/25/2017 17:14	Tanya Welborn	1916229
	07/25/2017			07/25/2017 17:16	Tanya Welborn	1916231, 1916232
	07/25/2017			07/25/2017 17:17	Tanya Welborn	1916233
	07/25/2017			07/25/2017 17:20	Tanya Welborn	1916230
SM 2320 B-97	07/25/2017			07/27/2017	Dale L. Simmons	1916229, 1916231
	07/25/2017			07/28/2017	Dale L. Simmons	1916230, 1916232, 1916233
SM 2540 C-97	07/25/2017			07/28/2017	Yijie Li	1916229, 1916230, 1916231, 1916232, 1916233
SM 2540 D-97	07/25/2017			07/28/2017	Yijie Li	1916229, 1916230, 1916231, 1916232, 1916233
SM 4500 F-C-97	07/25/2017			07/27/2017	Dale L. Simmons	1916229, 1916231
	07/25/2017			07/28/2017	Dale L. Simmons	1916230, 1916232, 1916233
SM 5310 B-00	07/25/2017			07/28/2017	Sofia Elnemr	1916234, 1916235, 1916236, 1916237, 1916238