Chemical Analysis Report

WAS-SECT-2018-05-03-01

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

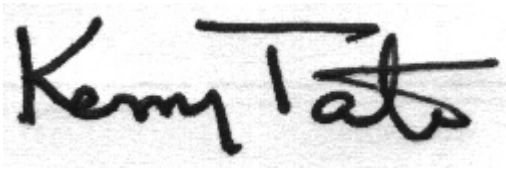
Event Description: **Dickson, St. Marks, East River**
Request ID: **RQ-2018-04-30-29**
Customer: **WAS-SECT**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Curtis Musson

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 17-MAY-2018 12:31



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: DICKSON BAY SOUTH **Collection Date/Time: 05/03/2018 09:45**

Field ID: G1WA0063 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990023	EPA 180.1 Rev. 2.0	Turbidity	7.3		NTU	P344610	
	SM 2320 B-97	Total Alkalinity	110		mg CaCO3/L	P345178	
	SM 2540 D-97	TSS	16		mg/L	P344820	
	SM 4500 F-C-97	Fluoride	1.0		mg F/L	P344920	
1990027	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P345111	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P344857	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P344802	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P344806	
	SM 5310 B-00	Organic Carbon	4.4		mg C/L	P344913	
1990031	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344635	

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: DICKSON BAY NORTH **Collection Date/Time: 05/03/2018 09:30**

Field ID: G1WA0062 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990024	EPA 180.1 Rev. 2.0	Turbidity	8.1		NTU	P344610	
	SM 2320 B-97	Total Alkalinity	113		mg CaCO3/L	P345178	
	SM 2540 D-97	TSS	16		mg/L	P344820	
	SM 4500 F-C-97	Fluoride	1.0		mg F/L	P344920	
1990028	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P345111	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P344857	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P344803	
	EPA 365.1 Rev. 2.0	Total-P	0.039		mg P/L	P344810	
	SM 5310 B-00	Organic Carbon	4.7		mg C/L	P344913	
1990032	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344635	

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: EAST RIVER DOWNSTREAM OF BOGGY BAYOU **Collection Date/Time: 05/03/2018 11:50**

Field ID: G1WA0056 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990025	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P344610	
	SM 2320 B-97	Total Alkalinity	128		mg CaCO3/L	P345178	
	SM 2540 D-97	TSS	9	IA	mg/L	P344820	
	SM 4500 F-C-97	Fluoride	0.74		mg F/L	P344920	
1990029	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P345111	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37	I	mg N/L	P344857	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P344803	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P344810	
	SM 5310 B-00	Organic Carbon	4.8		mg C/L	P344913	
1990033	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344636	

Field ID: G1WA0056 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

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: ST. MARKS RIVER AT CHANNEL MARKER 60 Collection Date/Time: 05/03/2018 12:25

Field ID: G1WA0055 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990026	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P344610	
	SM 2320 B-97	Total Alkalinity	139		mg CaCO3/L	P345176	RPD
	SM 2540 D-97	TSS	3	I	mg/L	P344818	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P345179	
1990030	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P345110	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29		mg N/L	P344943	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P345043	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P344808	
	SM 5310 B-00	Organic Carbon	2.3		mg C/L	P345108	
1990034	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.019		mg P/L	P344634	

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: P344610

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345110

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345111

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344857

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344943

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: P344802

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344803

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345043

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344806

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344808

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344810

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344634

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344635

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344636

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P345176

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

Reference Method: SM 2320 B-97
Batch ID: P345178

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

Reference Method: SM 2540 D-97
Batch ID: P344818

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P344820

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P344920

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P345179

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P344913

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

Reference Method: SM 5310 B-00
Batch ID: P345108

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345110

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345110

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345111

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344857

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344943

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344802

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344803

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345043

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: P344806

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344808

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344810

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344634

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344635

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344636

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

Reference Method: SM 2320 B-97
Batch ID: P345176

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P345178

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P344920

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.4		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P345179

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.7		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P344913

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.7		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P345108

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345110

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989832	Ammonia-N	99.3	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989800	Ammonia-N	99.2	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989892	Kjeldahl Nitrogen	104	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344943

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990367	Kjeldahl Nitrogen	97.1	97.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344802

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989660	NO2NO3-N	105	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344803

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990028	NO2NO3-N	104	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345043

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990053	NO2NO3-N	99.7	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344806

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344806

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989896	Total-P	93.0	94.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344808

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989926	Total-P	94.6	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344810

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990173	Total-P	98.2	97.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344634

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989830	O-Phosphate-P	98.6	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344635

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989802	O-Phosphate-P	98.0	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344636

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990033	O-Phosphate-P	95.4	95.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P344920

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989796	Fluoride	92.8	93.5	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P345179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990462	Fluoride	96.6	96.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P344913

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989790	Organic Carbon	90.2	91.8	P/P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P345108

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989766	Organic Carbon	100	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P344610

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989891	Turbidity	1.96	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345110

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989832	Ammonia-N	0.805	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989800	Ammonia-N	1.70	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989892	Kjeldahl Nitrogen	4.94	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344943

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990367	Kjeldahl Nitrogen	0.0828	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344802

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989660	NO2NO3-N	0.948	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344803

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990028	NO2NO3-N	1.43	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345043

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990053	NO2NO3-N	2.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344806

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989896	Total-P	1.66	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344808

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989926	Total-P	3.61	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990173	Total-P	0.930	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344634

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989830	O-Phosphate-P	0.304	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989802	O-Phosphate-P	0.531	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990033	O-Phosphate-P	0.209	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P345176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990462	Total Alkalinity	1.92	Sample	F	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P345178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989796	Total Alkalinity	0.243	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P344920

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989796	Fluoride	0.480	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P345179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990462	Fluoride	0.473	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P344913

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989790	Organic Carbon	1.41	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P345108

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989766	Organic Carbon	0.138	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83641
Included Lab Sample IDs: 1990023, 1990024, 1990025, 1990026

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	100	P/P	95 - 105

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A83654
Included Lab Sample IDs: 1990031, 1990032, 1990033, 1990034

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.2	P/P	90 - 110
O-Phosphate-P	98.7	97.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83710
Included Lab Sample IDs: 1990027, 1990028, 1990029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.5	P/P	90 - 110
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A83745
Included Lab Sample IDs: 1990027, 1990028, 1990029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.3	96.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83750
Included Lab Sample IDs: 1990023, 1990024, 1990025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.6	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83770
Included Lab Sample IDs: 1990027, 1990028, 1990029

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.0	94.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83795
Included Lab Sample IDs: 1990027, 1990028, 1990029, 1990030

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	101	P/P	90 - 110
Total-P	99.2	99.5	P/P	90 - 110
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83806
Included Lab Sample IDs: 1990030

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A83819
Included Lab Sample IDs: 1990030

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83820
Included Lab Sample IDs: 1990027, 1990028, 1990029, 1990030

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83824
Included Lab Sample IDs: 1990030

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	99.5	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A83837
Included Lab Sample IDs: 1990023, 1990024, 1990025, 1990026

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	99.0	P/P	90 - 110
Total Alkalinity	99.0	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83837
Included Lab Sample IDs: 1990026

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.6	97.6	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					1.96	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.3	100			0.805
	Ammonia-N	99.7	99.2	101			1.70
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	104	97.2			4.94
	Kjeldahl Nitrogen	102	97.1	97.0			0.0828
EPA 353.2 Rev. 2.0	NO2NO3-N	104	105	106			0.948
	NO2NO3-N	104	104	106			1.43
	NO2NO3-N	100	99.7	102			2.02
EPA 365.1 Rev. 2.0	Total-P	107	93.0	94.8			1.66

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 365.1 Rev. 2.0	Total-P	101	94.6	100			3.61
	Total-P	103	98.2	97.3			0.930
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.6	98.9			0.304
	O-Phosphate-P	99.6	98.0	98.9			0.531
	O-Phosphate-P	97.6	95.4	95.6			0.209
SM 2320 B-97	Total Alkalinity	101				1.92	
	Total Alkalinity	102				0.243	
SM 4500 F-C-97	Fluoride	94.4	92.8	93.5			0.480
	Fluoride	94.7	96.6	96.0			0.473
SM 5310 B-00	Organic Carbon	97.7	90.2	91.8			1.41
	Organic Carbon	101	100	101			0.138

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1990023, 1990024, 1990025, 1990026
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1990027, 1990028, 1990029, 1990030
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1990027, 1990028, 1990029, 1990030
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1990027, 1990028, 1990029, 1990030
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1990027, 1990028, 1990029, 1990030
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1990031, 1990032, 1990033, 1990034
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1990023, 1990024, 1990025, 1990026
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1990023, 1990024, 1990025, 1990026
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1990023, 1990024, 1990025, 1990026
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1990027, 1990028, 1990029, 1990030

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	05/03/2018			05/03/2018 15:50	William L. Brown IV	1990023, 1990024, 1990025, 1990026
EPA 350.1 Rev. 2.0	05/03/2018			05/10/2018 11:25	Ping Hua	1990030
	05/03/2018			05/10/2018 11:54	Ping Hua	1990027
	05/03/2018			05/10/2018 11:55	Ping Hua	1990028
	05/03/2018			05/10/2018 11:57	Ping Hua	1990029
EPA 351.2 Rev. 2.0	05/03/2018	05/08/2018 11:00	Adrian Shelby	05/09/2018 14:07	Joseph Suarez	1990027
	05/03/2018	05/08/2018 11:00	Adrian Shelby	05/09/2018 14:08	Joseph Suarez	1990028
	05/03/2018	05/08/2018 11:00	Adrian Shelby	05/09/2018 14:10	Joseph Suarez	1990029
	05/03/2018	05/09/2018 11:30	Adrian Shelby	05/11/2018 11:17	Joseph Suarez	1990030
EPA 353.2 Rev. 2.0	05/03/2018			05/07/2018 14:00	Lauren Bottorf	1990027
	05/03/2018			05/07/2018 14:07	Lauren Bottorf	1990028
	05/03/2018			05/07/2018 14:15	Lauren Bottorf	1990029
	05/03/2018			05/10/2018 11:18	Lauren Bottorf	1990030
EPA 365.1 Rev. 2.0	05/03/2018	05/07/2018 13:25	Sima Feizi	05/09/2018 13:29	Beverly Y. Sanders	1990027
	05/03/2018	05/07/2018 13:25	Sima Feizi	05/09/2018 13:56	Beverly Y. Sanders	1990028
	05/03/2018	05/07/2018 13:25	Sima Feizi	05/09/2018 13:57	Beverly Y. Sanders	1990029
	05/03/2018	05/07/2018 13:25	Sima Feizi	05/09/2018 14:14	Beverly Y. Sanders	1990030
EPA 365.1 Rev. 2.0 dissolved	05/03/2018			05/03/2018 15:45	Megan Treadwell	1990031
	05/03/2018			05/03/2018 15:46	Megan Treadwell	1990032
	05/03/2018			05/03/2018 15:47	Megan Treadwell	1990034
	05/03/2018			05/03/2018 16:08	Megan Treadwell	1990033
SM 2320 B-97	05/03/2018			05/11/2018 23:59	Dale L. Simmons	1990026
	05/03/2018			05/12/2018 09:01	Dale L. Simmons	1990023
	05/03/2018			05/12/2018 09:09	Dale L. Simmons	1990024
	05/03/2018			05/12/2018 09:16	Dale L. Simmons	1990025
SM 2540 D-97	05/03/2018			05/04/2018 15:30	William L. Brown IV	1990023, 1990024, 1990025, 1990026
SM 4500 F-C-97	05/03/2018			05/08/2018 18:59	Dale L. Simmons	1990023
	05/03/2018			05/08/2018 19:02	Dale L. Simmons	1990024
	05/03/2018			05/08/2018 19:06	Dale L. Simmons	1990025
	05/03/2018			05/11/2018 23:59	Dale L. Simmons	1990026
SM 5310 B-00	05/03/2018			05/08/2018 07:38	Megan Treadwell	1990027
	05/03/2018			05/08/2018 07:50	Megan Treadwell	1990028
	05/03/2018			05/08/2018 08:15	Megan Treadwell	1990029
	05/03/2018			05/11/2018 00:17	Julia Storbeck	1990030