Chemical Analysis Report

TLH-ROC-2018-05-16-01

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

Event Description: **kit A w/ bacteria**
Request ID: **RQ-2018-05-14-31**
Customer: **TLH-ROC**
Project ID: **SMP**

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2600 Blair Stone Rd
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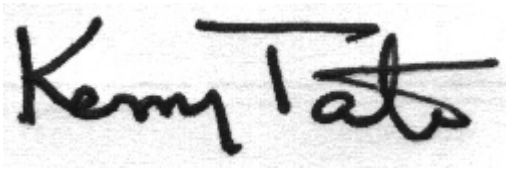
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 06-JUN-2018 11:14



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: Sand Hill Creek @ SW Hwy 358 **Collection Date/Time: 05/16/2018 10:40**

Field ID: G1TLHR0060 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993303	EPA 180.1 Rev. 2.0	Turbidity	4.3		NTU	P345459	
	EPA 300.0 Rev. 2.1	Chloride	9.7		mg Cl/L	P345684	
		Sulfate	0.88		mg SO4/L	P345687	
	SM 2120 B	Color (true)	97	A	PCU	P345515	
	SM 2320 B-97	Total Alkalinity	257		mg CaCO3/L	P345912	
	SM 2540 C-97	TDS	323		mg/L	P346043	
	SM 2540 D-97	TSS	3	I	mg/L	P345884	
	SM 4500 F-C-97	Fluoride	0.062	I	mg F/L	P345915	
1993310	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P345856	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P345616	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P345734	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P345611	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P345786	
1993317	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P345526	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Boggy Creek **Collection Date/Time: 05/16/2018 11:05**

Field ID: G1TLHR0005 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993304	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P345459	
	EPA 300.0 Rev. 2.1	Chloride	6.8	A	mg Cl/L	P345684	
		Sulfate	0.22	IA	mg SO4/L	P345687	
	SM 2120 B	Color (true)	190		PCU	P345515	
	SM 2320 B-97	Total Alkalinity	127		mg CaCO3/L	P345912	
	SM 2540 C-97	TDS	199		mg/L	P346043	
	SM 2540 D-97	TSS	3	I	mg/L	P345884	
	SM 4500 F-C-97	Fluoride	0.065	I	mg F/L	P345915	
1993311	EPA 350.1 Rev. 2.0	Ammonia-N	0.024		mg N/L	P345856	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P345616	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.028		mg N/L	P345734	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P345611	
	SM 5310 B-00	Organic Carbon	26		mg C/L	P345786	
1993318	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P345526	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Rocky Creek **Collection Date/Time: 05/16/2018 11:20**

Field ID: G1TLHR0004 Matrix: W-SURF-FRH

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

Field ID: G1TLHR0004 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993305	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P345459	
	EPA 300.0 Rev. 2.1	Chloride	7.1		mg Cl/L	P345684	
		Sulfate	0.30	I	mg SO4/L	P345687	
	SM 2120 B	Color (true)	110		PCU	P345515	
	SM 2320 B-97	Total Alkalinity	177		mg CaCO3/L	P345912	
	SM 2540 C-97	TDS	250		mg/L	P346043	
	SM 2540 D-97	TSS	3	I	mg/L	P345884	
	SM 4500 F-C-97	Fluoride	0.057	I	mg F/L	P345915	
1993312	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P345856	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P345616	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.012		mg N/L	P345734	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P345611	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P345786	
1993319	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P345526	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: EIGHTMILE CREEK @ NW 798 S **Collection Date/Time: 05/16/2018 11:50**

Field ID: G1TLHR0078 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993306	EPA 180.1 Rev. 2.0	Turbidity	2.9		NTU	P345459	
	EPA 300.0 Rev. 2.1	Chloride	6.3		mg Cl/L	P345684	
		Sulfate	0.29	I	mg SO4/L	P345687	
	SM 2120 B	Color (true)	310		PCU	P345515	
	SM 2320 B-97	Total Alkalinity	108		mg CaCO3/L	P345912	
	SM 2540 C-97	TDS	204		mg/L	P346043	
	SM 2540 D-97	TSS	4	I	mg/L	P345884	
	SM 4500 F-C-97	Fluoride	0.060	I	mg F/L	P345915	
1993313	EPA 350.1 Rev. 2.0	Ammonia-N	0.053		mg N/L	P345856	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P345616	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.079		mg N/L	P345734	
	EPA 365.1 Rev. 2.0	Total-P	0.068		mg P/L	P345661	
	SM 5310 B-00	Organic Carbon	34		mg C/L	P345786	
1993320	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.039		mg P/L	P345526	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Steinhatchee River @ S Canal Rd **Collection Date/Time: 05/16/2018 12:10**

Field ID: G1TLHR0064 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993307	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P345459	

Field ID: G1TLHR0064 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993307	EPA 300.0 Rev. 2.1	Chloride	6.0		mg Cl/L	P345684	
		Sulfate	4.4		mg SO4/L	P345687	
	SM 2120 B	Color (true)	270		PCU	P345515	
	SM 2320 B-97	Total Alkalinity	100		mg CaCO3/L	P345912	
	SM 2540 C-97	TDS	181		mg/L	P346043	
	SM 2540 D-97	TSS	6	I	mg/L	P345884	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P345915	
1993314	EPA 350.1 Rev. 2.0	Ammonia-N	0.038		mg N/L	P345856	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P345617	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.065		mg N/L	P345734	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P345661	
	SM 5310 B-00	Organic Carbon	29		mg C/L	P345786	
1993321	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.067		mg P/L	P345526	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Steinhatchee River 40m N of Yearling Rd **Collection Date/Time: 05/16/2018 12:25**

Field ID: GTLHR0065 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993308	EPA 180.1 Rev. 2.0	Turbidity	4.1		NTU	P345459	
	EPA 300.0 Rev. 2.1	Chloride	6.2		mg Cl/L	P345684	
		Sulfate	3.3		mg SO4/L	P345687	
	SM 2120 B	Color (true)	260		PCU	P345515	
	SM 2320 B-97	Total Alkalinity	113		mg CaCO3/L	P345912	
	SM 2540 C-97	TDS	173		mg/L	P346043	
	SM 2540 D-97	TSS	8	I	mg/L	P345884	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P345915	
1993315	EPA 350.1 Rev. 2.0	Ammonia-N	0.039		mg N/L	P345857	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P345617	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.057		mg N/L	P345734	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P345661	
	SM 5310 B-00	Organic Carbon	26		mg C/L	P345786	
1993322	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.086		mg P/L	P345526	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Steinhatchee Spring @ SE Wolf Rd **Collection Date/Time: 05/16/2018 12:40**

Field ID: GTLHR0066 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993309	EPA 180.1 Rev. 2.0	Turbidity	16		NTU	P345459	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P345684	

Field ID: GTLHR0066 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993309	EPA 300.0 Rev. 2.1	Sulfate	66		mg SO4/L	P345687	
	SM 2120 B	Color (true)	25	A	PCU	P345518	
	SM 2320 B-97	Total Alkalinity	320		mg CaCO3/L	P345912	
	SM 2540 C-97	TDS	449		mg/L	P346043	
	SM 2540 D-97	TSS	14		mg/L	P345884	
	SM 4500 F-C-97	Fluoride	0.31		mg F/L	P345915	
1993316	EPA 350.1 Rev. 2.0	Ammonia-N	0.19		mg N/L	P345857	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P345617	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345734	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P345661	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P345786	
1993323	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.069		mg P/L	P345526	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
EPA 300.0 Rev. 2.1: Sulfate: 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: P345459

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345684

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345687

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345856

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345857

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345616

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345617

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345734

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345611

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345661

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345526

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

Reference Method: SM 2120 B
Batch ID: P345515

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P345518

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P345912

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P346043

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345884

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P345915

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P345786

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: P345684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345687

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345856

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345857

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345616

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345616

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345617

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: P345734

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345611

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345661

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345526

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

Reference Method: SM 2320 B-97
Batch ID: P345912

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

Reference Method: SM 4500 F-C-97
Batch ID: P345915

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.9		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345786

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: P345684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993304	Chloride	95.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993304	Sulfate	97.6		P	90 - 110
1993350	Sulfate	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345856

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993221	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993315	Ammonia-N	99.8	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345616

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993201	Kjeldahl Nitrogen	98.4	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993363	Kjeldahl Nitrogen	99.5	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345734

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993310	NO2NO3-N	99.5	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345611

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993227	Total-P	95.0	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345661

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993363	Total-P	99.1	99.9	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345526

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993317	O-Phosphate-P	95.2	95.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P345915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993351	Fluoride	94.7	94.1	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345786

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993222	Organic Carbon	97.0	98.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P345459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993226	Turbidity	4.51	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993304	Chloride	0.257	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345856

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993221	Ammonia-N	0.182	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993315	Ammonia-N	0.709	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345616

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993201	Kjeldahl Nitrogen	1.34	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993363	Kjeldahl Nitrogen	0.0910	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345734

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993310	NO2NO3-N	1.97	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345611

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993227	Total-P	1.63	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993363	Total-P	0.711	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993317	O-Phosphate-P	0.291	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P345515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993303	Color (true)	3.42	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P345518

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993309	Color (true)	2.72	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P345912

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993351	Total Alkalinity	0.289	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P346043

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993220	TDS	4.21	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P345884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993220	TSS	6.59	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P345915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993351	Fluoride	0.474	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P345786

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993222	Organic Carbon	0.548	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: A83955
Included Lab Sample IDs: 1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309

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

Reference Method: SM 2120 B
Run ID: A83981
Included Lab Sample IDs: 1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115
Color (true)	101	101	P/P	90 - 115
Color (true)	98.5	100	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A83983
Included Lab Sample IDs: 1993317, 1993318, 1993319, 1993320, 1993321, 1993322, 1993323

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A83983
Included Lab Sample IDs: 1993317, 1993318, 1993319, 1993320, 1993321, 1993322, 1993323

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.3	P/P	90 - 110
O-Phosphate-P	99.1	101	P/P	90 - 110
O-Phosphate-P	99.3	98.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A84015
Included Lab Sample IDs: 1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.4	99.1	P/P	90 - 110
Chloride	99.1	99.2	P/P	90 - 110
Sulfate	100	102	P/P	90 - 110
Sulfate	102	101	P/P	90 - 110
Sulfate	102	98.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A84080
Included Lab Sample IDs: 1993310, 1993311, 1993312, 1993313, 1993314, 1993315, 1993316

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

Reference Method: SM 5310 B-00
Run ID: A84099
Included Lab Sample IDs: 1993310, 1993311, 1993312, 1993313, 1993314, 1993315, 1993316

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	99.8	P/P	90 - 110
Organic Carbon	99.8	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A84116
Included Lab Sample IDs: 1993310, 1993311, 1993312, 1993313, 1993314, 1993315, 1993316

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	101	P/P	90 - 110
Kjeldahl Nitrogen	98.8	96.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A84129
Included Lab Sample IDs: 1993310, 1993311, 1993312, 1993313, 1993314, 1993315, 1993316

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	102	P/P	90 - 110
Ammonia-N	99.5	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84131
Included Lab Sample IDs: 1993313, 1993314, 1993315, 1993316

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84131
Included Lab Sample IDs: 1993313, 1993314, 1993315, 1993316

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.4	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84134
Included Lab Sample IDs: 1993310, 1993311, 1993312

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

Reference Method: SM 2320 B-97
Run ID: A84146
Included Lab Sample IDs: 1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.7	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A84146
Included Lab Sample IDs: 1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.1	98.5	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					4.51	
EPA 300.0 Rev. 2.1	Chloride	97.7	95.4			0.257	
	Sulfate	98.8	97.6	97.1			
EPA 350.1 Rev. 2.0	Ammonia-N	99.5	102	102			0.182
	Ammonia-N	100	99.8	101			0.709
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	98.4	99.8			1.34
	Kjeldahl Nitrogen	104	99.5	99.4			0.0910
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	99.5	102			1.97
EPA 365.1 Rev. 2.0	Total-P	98.4	95.0	96.7			1.63
	Total-P	100	99.1	99.9			0.711
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	95.2	95.5			0.291
SM 2120 B	Color (true)					3.42	
	Color (true)					2.72	
SM 2320 B-97	Total Alkalinity	102				0.289	
SM 2540 C-97	TDS					4.21	
SM 2540 D-97	TSS					6.59	
SM 4500 F-C-97	Fluoride	95.9	94.7	94.1			0.474
SM 5310 B-00	Organic Carbon	99.6	97.0	98.2			0.548

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1993310, 1993311, 1993312, 1993313, 1993314, 1993315, 1993316
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1993310, 1993311, 1993312, 1993313, 1993314, 1993315, 1993316
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1993310, 1993311, 1993312, 1993313, 1993314, 1993315, 1993316
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1993310, 1993311, 1993312, 1993313, 1993314, 1993315, 1993316
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1993317, 1993318, 1993319, 1993320, 1993321, 1993322, 1993323
SM 2120 B / E31780	True Color measured at 450 nm	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1993310, 1993311, 1993312, 1993313, 1993314, 1993315, 1993316

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	05/16/2018			05/16/2018 16:23	William L. Brown IV	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
EPA 300.0 Rev. 2.1	05/16/2018			05/18/2018 22:32	Lipi Saha	1993304
	05/16/2018			05/18/2018 23:32	Lipi Saha	1993303
	05/16/2018			05/18/2018 23:43	Lipi Saha	1993305
	05/16/2018			05/18/2018 23:55	Lipi Saha	1993306
	05/16/2018			05/19/2018 00:07	Lipi Saha	1993307
	05/16/2018			05/19/2018 00:43	Lipi Saha	1993308
	05/16/2018			05/19/2018 00:55	Lipi Saha	1993309
	05/16/2018			05/19/2018 08:29	Lipi Saha	1993303
EPA 350.1 Rev. 2.0	05/16/2018			05/22/2018 10:54	Ping Hua	1993310
	05/16/2018			05/22/2018 10:55	Ping Hua	1993311
	05/16/2018			05/22/2018 10:57	Ping Hua	1993312
	05/16/2018			05/22/2018 10:58	Ping Hua	1993313
	05/16/2018			05/22/2018 11:00	Ping Hua	1993314
	05/16/2018			05/22/2018 11:10	Ping Hua	1993315
	05/16/2018			05/22/2018 11:15	Ping Hua	1993316
EPA 351.2 Rev. 2.0	05/16/2018	05/21/2018 12:00	Tanya Welborn	05/23/2018 14:56	Joseph Suarez	1993310
	05/16/2018	05/21/2018 12:00	Tanya Welborn	05/23/2018 14:58	Joseph Suarez	1993311
	05/16/2018	05/21/2018 12:00	Tanya Welborn	05/23/2018 15:00	Joseph Suarez	1993312
	05/16/2018	05/21/2018 12:00	Tanya Welborn	05/23/2018 15:01	Joseph Suarez	1993313
	05/16/2018	05/21/2018 12:00	Tanya Welborn	05/23/2018 15:06	Joseph Suarez	1993314
	05/16/2018	05/21/2018 12:00	Tanya Welborn	05/23/2018 15:07	Joseph Suarez	1993315
	05/16/2018	05/21/2018 12:00	Tanya Welborn	05/23/2018 15:12	Joseph Suarez	1993316
EPA 353.2 Rev. 2.0	05/16/2018			05/22/2018 11:25	Lauren Bottorf	1993310
	05/16/2018			05/22/2018 11:32	Lauren Bottorf	1993311
	05/16/2018			05/22/2018 11:33	Lauren Bottorf	1993312
	05/16/2018			05/22/2018 11:34	Lauren Bottorf	1993313
	05/16/2018			05/22/2018 11:35	Lauren Bottorf	1993314
	05/16/2018			05/22/2018 11:36	Lauren Bottorf	1993315
	05/16/2018			05/22/2018 11:38	Lauren Bottorf	1993316
EPA 365.1 Rev. 2.0	05/16/2018	05/21/2018 13:05	Sima Feizi	05/23/2018 12:36	Beverly Y. Sanders	1993313
	05/16/2018	05/21/2018 13:05	Sima Feizi	05/23/2018 12:38	Beverly Y. Sanders	1993314
	05/16/2018	05/21/2018 13:05	Sima Feizi	05/23/2018 12:39	Beverly Y. Sanders	1993315
	05/16/2018	05/21/2018 13:05	Sima Feizi	05/23/2018 12:40	Beverly Y. Sanders	1993316
	05/16/2018	05/21/2018 13:05	Sima Feizi	05/24/2018 09:01	Beverly Y. Sanders	1993310
	05/16/2018	05/21/2018 13:05	Sima Feizi	05/24/2018 09:02	Beverly Y. Sanders	1993311
	05/16/2018	05/21/2018 13:05	Sima Feizi	05/24/2018 09:03	Beverly Y. Sanders	1993312
EPA 365.1 Rev. 2.0 dissolved	05/16/2018			05/17/2018 15:27	Megan Treadwell	1993317
	05/16/2018			05/17/2018 15:44	Megan Treadwell	1993318, 1993319

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 365.1 Rev. 2.0 dissolved	05/16/2018			05/17/2018 15:45	Megan Treadwell	1993320
	05/16/2018			05/17/2018 15:50	Megan Treadwell	1993321
	05/16/2018			05/17/2018 15:51	Megan Treadwell	1993322
	05/16/2018			05/17/2018 15:52	Megan Treadwell	1993323
SM 2120 B	05/16/2018			05/17/2018 13:58	Tanya Welborn	1993303
	05/16/2018			05/17/2018 14:00	Tanya Welborn	1993305
	05/16/2018			05/17/2018 14:25	Tanya Welborn	1993309
	05/16/2018			05/17/2018 14:31	Tanya Welborn	1993304
	05/16/2018			05/17/2018 14:32	Tanya Welborn	1993306, 1993307
	05/16/2018			05/17/2018 14:33	Tanya Welborn	1993308
SM 2320 B-97	05/16/2018			05/24/2018 00:03	Dale L. Simmons	1993303
	05/16/2018			05/24/2018 00:13	Dale L. Simmons	1993304
	05/16/2018			05/24/2018 00:24	Dale L. Simmons	1993305
	05/16/2018			05/24/2018 00:34	Dale L. Simmons	1993306
	05/16/2018			05/24/2018 00:44	Dale L. Simmons	1993307
	05/16/2018			05/24/2018 00:55	Dale L. Simmons	1993308
	05/16/2018			05/24/2018 01:06	Dale L. Simmons	1993309
SM 2540 C-97	05/16/2018			05/19/2018 23:10	Yijie Li	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
SM 2540 D-97	05/16/2018			05/19/2018 23:10	Yijie Li	1993303, 1993304, 1993305, 1993306, 1993307, 1993308, 1993309
SM 4500 F-C-97	05/16/2018			05/24/2018 00:03	Dale L. Simmons	1993303
	05/16/2018			05/24/2018 00:13	Dale L. Simmons	1993304
	05/16/2018			05/24/2018 00:24	Dale L. Simmons	1993305
	05/16/2018			05/24/2018 00:34	Dale L. Simmons	1993306
	05/16/2018			05/24/2018 00:44	Dale L. Simmons	1993307
	05/16/2018			05/24/2018 00:55	Dale L. Simmons	1993308
	05/16/2018			05/24/2018 01:06	Dale L. Simmons	1993309
SM 5310 B-00	05/16/2018			05/22/2018 00:39	Megan Treadwell	1993310
	05/16/2018			05/22/2018 00:51	Megan Treadwell	1993311
	05/16/2018			05/22/2018 01:06	Megan Treadwell	1993312
	05/16/2018			05/22/2018 01:18	Megan Treadwell	1993313
	05/16/2018			05/22/2018 01:31	Megan Treadwell	1993314
	05/16/2018			05/22/2018 01:43	Megan Treadwell	1993315
	05/16/2018			05/22/2018 02:20	Megan Treadwell	1993316