Chemical Analysis Report

TLH-ROC-2018-06-04-02

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-2018-05-14-54**
Customer: **TLH-ROC**
Project ID: **SMP**

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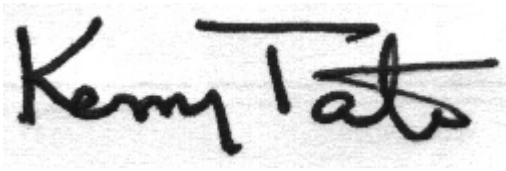
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 26-JUN-2018 13:02



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: MIDDLE OF LAKE FRANCIS **Collection Date/Time: 06/04/2018 11:35**

Field ID: G1TLHR0045 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1996926	EPA 180.1 Rev. 2.0	Turbidity	2.5	A	NTU	P346428	
	EPA 300.0 Rev. 2.1	Chloride	1.9		mg Cl/L	P346586	
		Sulfate	0.55		mg SO4/L	P346588	
	SM 2120 B	Color (true)	7.7		PCU	P346412	
	SM 2320 B-97	Total Alkalinity	69		mg CaCO3/L	P346614	
	SM 2540 C-97	TDS	90		mg/L	P346793	
	SM 2540 D-97	TSS	3	I	mg/L	P346732	
	SM 4500 F-C-97	Fluoride	0.060	I	mg F/L	P346618	
1996931	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P346696	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P347042	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P346506	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P346656	
	SM 5310 B-00	Organic Carbon	5.2		mg C/L	P346677	
1996936	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.039		mg P/L	P346405	

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.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: JUMPING GULLEY CREEK **Collection Date/Time: 06/04/2018 12:15**

Field ID: G1TLHR0033 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1996927	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P346428	
	EPA 300.0 Rev. 2.1	Chloride	7.3		mg Cl/L	P346586	
		Sulfate	0.28	I	mg SO4/L	P346588	
	SM 2120 B	Color (true)	86	A	PCU	P346412	
	SM 2320 B-97	Total Alkalinity	3.9		mg CaCO3/L	P346614	
	SM 2540 C-97	TDS	32		mg/L	P346793	
	SM 2540 D-97	TSS	4	I	mg/L	P346732	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P346618	
1996932	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P346800	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.74		mg N/L	P347042	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.062		mg N/L	P346507	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P346656	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P346677	
1996937	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.077		mg P/L	P346405	

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.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: LITTLE ALAPAHA RIVER **Collection Date/Time: 06/04/2018 12:50**

Field ID: G1TLHR0037 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1996928	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P346428	
	EPA 300.0 Rev. 2.1	Chloride	6.2		mg Cl/L	P346586	
		Sulfate	0.25	I	mg SO4/L	P346588	
	SM 2120 B	Color (true)	940		PCU	P346412	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P346614	
	SM 2540 C-97	TDS	103		mg/L	P346793	
	SM 2540 D-97	TSS	3	I	mg/L	P346732	
	SM 4500 F-C-97	Fluoride	0.087	I	mg F/L	P346618	
1996933	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P346800	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P347042	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	U	mg N/L	P346682	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P346657	
	SM 5310 B-00	Organic Carbon	84		mg C/L	P346677	
1996938	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P346405	

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.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 353.2 Rev. 2.0: The MDL was elevated due to sample matrix interference.

Sample Location: SUGAR CREEK @ SUWANNEE RIV **Collection Date/Time: 06/04/2018 13:40**

Field ID: G1TLHR0047 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1996929	EPA 180.1 Rev. 2.0	Turbidity	8.0		NTU	P346428	
	EPA 300.0 Rev. 2.1	Chloride	8.3		mg Cl/L	P346586	
		Sulfate	5.2		mg SO4/L	P346588	
	SM 2120 B	Color (true)	220		PCU	P346412	
	SM 2320 B-97	Total Alkalinity	37		mg CaCO3/L	P346614	
	SM 2540 C-97	TDS	100		mg/L	P346794	
	SM 2540 D-97	TSS	10		mg/L	P346733	
	SM 4500 F-C-97	Fluoride	0.44		mg F/L	P346618	
1996934	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P346800	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P347042	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.29		mg N/L	P346507	
	EPA 365.1 Rev. 2.0	Total-P	0.96		mg P/L	P346657	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P346677	
1996939	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.74		mg P/L	P346405	

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.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: BETHEL CREEK @ MILL CREEK **Collection Date/Time: 06/04/2018 14:30**

Field ID: G1TLHR0062 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1996930	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P346428	
	EPA 300.0 Rev. 2.1	Chloride	3.7		mg Cl/L	P346586	
		Sulfate	0.70		mg SO4/L	P346588	
	SM 2120 B	Color (true)	940		PCU	P346412	
	SM 2320 B-97	Total Alkalinity	9.8		mg CaCO3/L	P346614	
	SM 2540 C-97	TDS	125		mg/L	P346794	
	SM 2540 D-97	TSS	4	I	mg/L	P346733	
	SM 4500 F-C-97	Fluoride	0.042	I	mg F/L	P346618	
1996935	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P346800	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P347042	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P346507	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P346657	
	SM 5310 B-00	Organic Carbon	67		mg C/L	P346677	
1996940	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P346405	

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.
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: P346428

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346586

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346588

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346696

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346800

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P347042

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346506

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346507

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346682

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346656

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346657

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P346405

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

Reference Method: SM 2120 B
Batch ID: P346412

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P346614

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

Reference Method: SM 2540 C-97
Batch ID: P346793

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P346794

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P346732

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P346733

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P346618

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P346677

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: P346586

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346588

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346696

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346800

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P347042

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346506

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346507

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346682

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346656

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346657

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P346405

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

Reference Method: SM 2320 B-97
Batch ID: P346614

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

Reference Method: SM 4500 F-C-97
Batch ID: P346618

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

Reference Method: SM 5310 B-00
Batch ID: P346677

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346586

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996910	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996910	Sulfate	101		P	90 - 110
1996969	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346696

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996801	Ammonia-N	93.7	97.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346800

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996932	Ammonia-N	101	99.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P347042

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996957	Kjeldahl Nitrogen	92.8	96.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346506

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996801	NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346507

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996932	NO2NO3-N	98.8	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1997719	NO2NO3-N	97.3	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346656

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996803	Total-P	105	102	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346657

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1997096	Total-P	104	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P346405

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996936	O-Phosphate-P	99.1	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P346618

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996959	Fluoride	94.9	95.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P346677

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1996913	Organic Carbon	101		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P346428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996926	Turbidity	0.394	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346586

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996910	Chloride	0.538	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P346588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996910	Sulfate	1.25	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346696

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996801	Ammonia-N	1.91	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P346800

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996932	Ammonia-N	1.02	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P347042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996957	Kjeldahl Nitrogen	2.05	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346506

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996801	NO2NO3-N	0.242	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996932	NO2NO3-N	1.53	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P346682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1997719	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996803	Total-P	2.67	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P346657

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1997096	Total-P	2.83	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P346405

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996936	O-Phosphate-P	0.791	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P346412

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996927	Color (true)	0.166	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P346614

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996959	Total Alkalinity	0.289	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P346793

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996819	TDS	3.51	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P346794

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996956	TDS	1.79	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P346618

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996959	Fluoride	0.479	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P346677

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1996913	Organic Carbon	0.397	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 300.0 Rev. 2.1
Run ID: A84339
Included Lab Sample IDs: 1996926, 1996927, 1996928, 1996929, 1996930

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	102	P/P	90 - 110
Chloride	102	99.9	P/P	90 - 110
Sulfate	101	98.9	P/P	90 - 110
Sulfate	99.3	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A84357
Included Lab Sample IDs: 1996936, 1996937, 1996938, 1996939, 1996940

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.6	98.2	P/P	90 - 110
O-Phosphate-P	98.5	98.0	P/P	90 - 110
O-Phosphate-P	99.2	100	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A84360
Included Lab Sample IDs: 1996926, 1996927, 1996928, 1996929, 1996930

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 115
Color (true)	101	101	P/P	90 - 115
Color (true)	99.7	101	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A84364
Included Lab Sample IDs: 1996926, 1996927, 1996928, 1996929, 1996930

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A84398
Included Lab Sample IDs: 1996931, 1996932, 1996934, 1996935

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

Reference Method: SM 2320 B-97
Run ID: A84458
Included Lab Sample IDs: 1996926, 1996927, 1996928, 1996929, 1996930

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

Reference Method: SM 4500 F-C-97
Run ID: A84458
Included Lab Sample IDs: 1996926, 1996927, 1996928, 1996929, 1996930

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	98.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A84491
Included Lab Sample IDs: 1996931, 1996932, 1996933, 1996934, 1996935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.5	98.0	P/P	90 - 110
Organic Carbon	97.8	97.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A84493
Included Lab Sample IDs: 1996933

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A84494
Included Lab Sample IDs: 1996931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84521
Included Lab Sample IDs: 1996931, 1996932, 1996933, 1996934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	101	P/P	90 - 110
Total-P	101	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A84534
Included Lab Sample IDs: 1996932, 1996933, 1996934, 1996935

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84553
Included Lab Sample IDs: 1996935

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A84735
Included Lab Sample IDs: 1996931, 1996932, 1996933, 1996934, 1996935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	102	P/P	90 - 110
Kjeldahl Nitrogen	95.4	104	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					0.394	
EPA 300.0 Rev. 2.1	Chloride	104	101			0.538	
	Sulfate	104	101	104		1.25	
EPA 350.1 Rev. 2.0	Ammonia-N	100	93.7	97.0			1.91
	Ammonia-N	101	101	99.7			1.02
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.0	92.8	96.0			2.05
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	99.5				0.242
	NO2NO3-N	99.5	98.8	101			1.53
	NO2NO3-N	99.0	97.3	97.8			0.501
EPA 365.1 Rev. 2.0	Total-P	102	105	102			2.67
	Total-P	101	104	107			2.83
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	99.1	100			0.791
SM 2120 B	Color (true)					0.166	
SM 2320 B-97	Total Alkalinity	102				0.289	
SM 2540 C-97	TDS					3.51	
	TDS					1.79	
SM 4500 F-C-97	Fluoride	96.0	94.9	95.4			0.479
SM 5310 B-00	Organic Carbon	98.8	101				0.397

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1996926, 1996927, 1996928, 1996929, 1996930
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1996926, 1996927, 1996928, 1996929, 1996930
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1996926, 1996927, 1996928, 1996929, 1996930
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1996931, 1996932, 1996933, 1996934, 1996935
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1996931, 1996932, 1996933, 1996934, 1996935
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1996931, 1996932, 1996933, 1996934, 1996935
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1996931, 1996932, 1996933, 1996934, 1996935
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1996936, 1996937, 1996938, 1996939, 1996940
SM 2120 B / E31780	True Color measured at 450 nm	1996926, 1996927, 1996928, 1996929, 1996930
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1996926, 1996927, 1996928, 1996929, 1996930
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1996926, 1996927, 1996928, 1996929, 1996930
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	1996926, 1996927, 1996928, 1996929, 1996930
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1996926, 1996927, 1996928, 1996929, 1996930
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1996931, 1996932, 1996933, 1996934, 1996935

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	06/04/2018			06/05/2018 17:06	William L. Brown IV	1996926, 1996927, 1996928, 1996929, 1996930
EPA 300.0 Rev. 2.1	06/04/2018			06/06/2018 14:02	Lipi Saha	1996926
	06/04/2018			06/06/2018 14:14	Lipi Saha	1996927
	06/04/2018			06/06/2018 14:49	Lipi Saha	1996928
	06/04/2018			06/06/2018 15:01	Lipi Saha	1996929
	06/04/2018			06/06/2018 15:13	Lipi Saha	1996930
EPA 350.1 Rev. 2.0	06/04/2018			06/11/2018 15:29	Julia Storbeck	1996931
	06/04/2018			06/12/2018 09:07	Ping Hua	1996932
	06/04/2018			06/12/2018 09:11	Ping Hua	1996933
	06/04/2018			06/12/2018 09:20	Ping Hua	1996934
	06/04/2018			06/12/2018 09:22	Ping Hua	1996935
EPA 351.2 Rev. 2.0	06/04/2018	06/18/2018 15:30	Adrian Shelby	06/20/2018 11:59	Joseph Suarez	1996931
	06/04/2018	06/18/2018 15:30	Adrian Shelby	06/20/2018 12:03	Joseph Suarez	1996932
	06/04/2018	06/18/2018 15:30	Adrian Shelby	06/20/2018 12:05	Joseph Suarez	1996933
	06/04/2018	06/18/2018 15:30	Adrian Shelby	06/20/2018 12:06	Joseph Suarez	1996934
	06/04/2018	06/18/2018 15:30	Adrian Shelby	06/20/2018 12:08	Joseph Suarez	1996935
EPA 353.2 Rev. 2.0	06/04/2018			06/06/2018 15:17	Lauren Bottorf	1996931
	06/04/2018			06/06/2018 15:24	Lauren Bottorf	1996932
	06/04/2018			06/06/2018 15:36	Lauren Bottorf	1996934
	06/04/2018			06/06/2018 15:37	Lauren Bottorf	1996935
	06/04/2018			06/11/2018 11:55	Lauren Bottorf	1996933
EPA 365.1 Rev. 2.0	06/04/2018	06/11/2018 12:30	Adrian Shelby	06/12/2018 11:34	Beverly Y. Sanders	1996931
	06/04/2018	06/11/2018 12:30	Adrian Shelby	06/12/2018 11:36	Beverly Y. Sanders	1996932
	06/04/2018	06/11/2018 12:30	Adrian Shelby	06/12/2018 11:45	Beverly Y. Sanders	1996933
	06/04/2018	06/11/2018 12:30	Adrian Shelby	06/12/2018 11:46	Beverly Y. Sanders	1996934
	06/04/2018	06/11/2018 12:30	Adrian Shelby	06/13/2018 12:37	Beverly Y. Sanders	1996935
EPA 365.1 Rev. 2.0 dissolved	06/04/2018			06/05/2018 14:24	Megan Treadwell	1996936
	06/04/2018			06/05/2018 14:46	Megan Treadwell	1996937
	06/04/2018			06/05/2018 14:47	Megan Treadwell	1996938
	06/04/2018			06/05/2018 14:48	Megan Treadwell	1996940
	06/04/2018			06/05/2018 15:21	Megan Treadwell	1996939
SM 2120 B	06/04/2018			06/05/2018 14:35	Tanya Welborn	1996926
	06/04/2018			06/05/2018 14:37	Tanya Welborn	1996927
	06/04/2018			06/05/2018 15:23	Tanya Welborn	1996928
	06/04/2018			06/05/2018 15:26	Tanya Welborn	1996929, 1996930
SM 2320 B-97	06/04/2018			06/07/2018 07:45	Dale L. Simmons	1996926
	06/04/2018			06/07/2018 07:55	Dale L. Simmons	1996927
	06/04/2018			06/07/2018 08:04	Dale L. Simmons	1996928
	06/04/2018			06/07/2018 08:14	Dale L. Simmons	1996929

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2320 B-97	06/04/2018			06/07/2018 08:24	Dale L. Simmons	1996930
SM 2540 C-97	06/04/2018			06/06/2018 15:03	Yijie Li	1996926, 1996927, 1996928, 1996929, 1996930
SM 2540 D-97	06/04/2018			06/06/2018 15:03	Yijie Li	1996926, 1996927, 1996928, 1996929, 1996930
SM 4500 F-C-97	06/04/2018			06/07/2018 07:45	Dale L. Simmons	1996926
	06/04/2018			06/07/2018 07:55	Dale L. Simmons	1996927
	06/04/2018			06/07/2018 08:04	Dale L. Simmons	1996928
	06/04/2018			06/07/2018 08:14	Dale L. Simmons	1996929
	06/04/2018			06/07/2018 08:24	Dale L. Simmons	1996930
SM 5310 B-00	06/04/2018			06/09/2018 03:47	Megan Treadwell	1996931
	06/04/2018			06/09/2018 04:23	Megan Treadwell	1996932
	06/04/2018			06/09/2018 04:36	Megan Treadwell	1996933
	06/04/2018			06/09/2018 04:48	Megan Treadwell	1996934
	06/04/2018			06/09/2018 05:01	Megan Treadwell	1996935