

Chemical Analysis Report

TLH-ROC-2018-04-18-03

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-2018-04-09-52**
Customer: **TLH-ROC**
Project ID: **SMP**

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

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: 09-MAY-2018 15:37

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Unnamed Branch @ Flat Creek Rd

Collection Date/Time: 04/18/2018 09:40

Field ID: G2TLHR0031

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1985673	EPA 180.1 Rev. 2.0	Turbidity	5.3		NTU	P343683	
	EPA 300.0 Rev. 2.1	Chloride	4.8		mg Cl/L	P343783	
		Sulfate	1.6		mg SO4/L	P343786	
	SM 2120 B	Color (true)	36		PCU	P343752	
	SM 2320 B-97	Total Alkalinity	61		mg CaCO3/L	P344297	
	SM 2540 C-97	TDS	70		mg/L	P344257	
	SM 2540 D-97	TSS	3	I	mg/L	P344263	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P344301	
1985678	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P344167	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29		mg N/L	P343797	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P343905	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P343975	
	SM 5310 B-00	Organic Carbon	3.5		mg C/L	P343981	
1985683	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P343678	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The result was confirmed on 04/26/2018.

EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 05/01/2018.

Sample Location: Unnamed Branch @ Flat Creek Rd

Collection Date/Time: 04/18/2018 09:45

Field ID: G1TLHR0031_DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1985674	EPA 180.1 Rev. 2.0	Turbidity	6.2		NTU	P343683	
	EPA 300.0 Rev. 2.1	Chloride	4.8		mg Cl/L	P343783	
		Sulfate	1.6		mg SO4/L	P343786	
	SM 2120 B	Color (true)	35		PCU	P343752	
	SM 2320 B-97	Total Alkalinity	63		mg CaCO3/L	P344297	
	SM 2540 C-97	TDS	76		mg/L	P344257	
	SM 2540 D-97	TSS	12		mg/L	P344263	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P344301	
1985679	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P344167	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26		mg N/L	P343797	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P343905	
	EPA 365.1 Rev. 2.0	Total-P	0.046		mg P/L	P343975	
	SM 5310 B-00	Organic Carbon	3.3		mg C/L	P343981	
1985684	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.023		mg P/L	P343678	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The result was confirmed on 04/26/2018.

EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 05/02/2018.

Sample Location: Unnamed Branch @ Flat Creek Rd

Collection Date/Time: 04/18/2018 09:50

Field ID: BLANK_04182018

Matrix: DI-WATER

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

Field ID: BLANK_04182018

Matrix: DI-WATER

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1985675	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P343684	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P343854	
		Sulfate	0.20	U	mg SO4/L	P343857	
	SM 2120 B	Color (true)	2.5	U	PCU	P343752	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P344297	
	SM 2540 C-97	TDS	15	U	mg/L	P344256	
	SM 2540 D-97	TSS	2	U	mg/L	P344262	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P344301	
1985680	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P344167	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P343797	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P343905	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P343975	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P343981	
1985685	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P343678	

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: Lake Seminole 200m from Boat Ramp @ River Rd **Collection Date/Time: 04/18/2018 10:40**

Field ID: G2TLHR0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1985676	EPA 180.1 Rev. 2.0	Turbidity	3.3	A	NTU	P343684	
	EPA 300.0 Rev. 2.1	Chloride	6.5	A	mg Cl/L	P343854	
		Sulfate	7.6	A	mg SO4/L	P343857	
	SM 2120 B	Color (true)	11		PCU	P343752	
	SM 2320 B-97	Total Alkalinity	62		mg CaCO3/L	P344297	
	SM 2540 C-97	TDS	88	A	mg/L	P344258	
	SM 2540 D-97	TSS	3	IA	mg/L	P344264	
	SM 4500 F-C-97	Fluoride	0.096	I	mg F/L	P344301	
1985681	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P344167	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31		mg N/L	P343797	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.62		mg N/L	P343905	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P343975	
	SM 5310 B-00	Organic Carbon	2.4		mg C/L	P343981	
1985686	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P343678	

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: Unnamed Branch @ Hardaway Rd 2 **Collection Date/Time: 04/18/2018 11:35**

Field ID: G2TLHR0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1985677	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P343684	
	EPA 300.0 Rev. 2.1	Chloride	3.9		mg Cl/L	P343854	
		Sulfate	0.91		mg SO4/L	P343857	

Field ID: G2TLHR0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1985677	SM 2120 B	Color (true)	29		PCU	P343752	
	SM 2320 B-97	Total Alkalinity	3.2		mg CaCO3/L	P344297	
	SM 2540 C-97	TDS	15	U	mg/L	P344258	
	SM 2540 D-97	TSS	5	I	mg/L	P344264	
	SM 4500 F-C-97	Fluoride	0.054	I	mg F/L	P344301	
1985682	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P344167	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24		mg N/L	P343797	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P343905	
	EPA 365.1 Rev. 2.0	Total-P	0.085		mg P/L	P343975	
	SM 5310 B-00	Organic Carbon	2.5		mg C/L	P343981	
1985687	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.048		mg P/L	P343678	

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: P343683

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P343684

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P343783

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P343786

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P343854

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P343857

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344167

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343797

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343905

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343975

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343678

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

Reference Method: SM 2120 B
Batch ID: P343752

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P344297

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

Reference Method: SM 2540 C-97
Batch ID: P344256

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P344257

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P344258

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P344262

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P344263

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P344264

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P344301

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P343981

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: P343783

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343786

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343854

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P343854

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

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P343857

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P344167

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P343797

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P343905

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P343975

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P343678

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

Reference Method: SM 2320 B-97
 Batch ID: P344297

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

Reference Method: SM 4500 F-C-97
 Batch ID: P344301

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.3		P	91 - 105

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P343981

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343783

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985649	Chloride	100	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343786

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985649	Sulfate	97.9	98.4	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343854

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985676	Chloride	95.5		P	90 - 110
1985803	Chloride	95.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985676	Sulfate	92.4		P	90 - 110
1985803	Sulfate	95.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344167

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985639	Ammonia-N	98.0	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343797

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985682	Kjeldahl Nitrogen	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343905

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985650	NO2NO3-N	96.0	96.5	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343975

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985681	Total-P	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343678

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985659	O-Phosphate-P	97.0	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P344301

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985583	Fluoride	95.7	97.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985678	Organic Carbon	94.7	95.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985581	Turbidity	4.29	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985676	Turbidity	1.23	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343783

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985649	Chloride	0.187	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343786

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985649	Sulfate	0.526	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985676	Chloride	0.715	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985676	Sulfate	0.590	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985639	Ammonia-N	1.59	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343797

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985682	Kjeldahl Nitrogen	0.949	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343905

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985650	NO2NO3-N	0.519	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343975

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985681	Total-P	2.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343678

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985659	O-Phosphate-P	1.34	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P343752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985655	Color (true)	0.436	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P344297

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985583	Total Alkalinity	0.144	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P344256

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985583	TDS	7.27	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P344257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985637	TDS	3.53	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P344258

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985676	TDS	6.82	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P344301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985583	Fluoride	0.960	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P343981

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985678	Organic Carbon	0.622	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: A83267
Included Lab Sample IDs: 1985673, 1985674, 1985675, 1985676, 1985677

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.5	99.8	P/P	90 - 110
Chloride	99.9	98.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A83267

Included Lab Sample IDs: 1985673, 1985674, 1985675, 1985676, 1985677

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A83323

Included Lab Sample IDs: 1985683, 1985684, 1985685, 1985686, 1985687

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A83324

Included Lab Sample IDs: 1985673, 1985674, 1985675, 1985676, 1985677

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.0	P/P	95 - 105
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A83349

Included Lab Sample IDs: 1985673, 1985674, 1985675, 1985676, 1985677

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.3	99.1	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A83402

Included Lab Sample IDs: 1985678, 1985679, 1985680, 1985681, 1985682

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A83410

Included Lab Sample IDs: 1985678, 1985679, 1985680, 1985681, 1985682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	99.4	P/P	90 - 110
Kjeldahl Nitrogen	99.4	96.7	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A83430

Included Lab Sample IDs: 1985678, 1985679, 1985680, 1985681, 1985682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	97.6	P/P	90 - 110
Organic Carbon	97.6	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A83447

Included Lab Sample IDs: 1985678, 1985682

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A83473

Included Lab Sample IDs: 1985679, 1985680, 1985681

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A83491

Included Lab Sample IDs: 1985678, 1985679, 1985680, 1985681, 1985682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A83541

Included Lab Sample IDs: 1985673, 1985674, 1985675, 1985676, 1985677

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A83541

Included Lab Sample IDs: 1985673, 1985674, 1985675, 1985676, 1985677

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.1	101	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				4.29	
	Turbidity				1.23	
EPA 300.0 Rev. 2.1	Chloride	97.3	100 100			0.187
	Chloride	96.4	95.5 95.5		0.715	
	Sulfate	96.7	97.9 98.4			0.526
	Sulfate	95.3	92.4 95.7		0.590	
EPA 350.1 Rev. 2.0	Ammonia-N	102	98.0 100			1.59
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	101 102			0.949
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	96.0 96.5			0.519
EPA 365.1 Rev. 2.0	Total-P	105	100 102			2.19
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	97.0 98.6			1.34

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
SM 2120 B	Color (true)				0.436	
SM 2320 B-97	Total Alkalinity	102			0.144	
SM 2540 C-97	TDS				7.27	
	TDS				3.53	
	TDS				6.82	
SM 4500 F-C-97	Fluoride	96.3	95.7	97.0		0.960
SM 5310 B-00	Organic Carbon	96.1	94.7	95.4		0.622

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1985673, 1985674, 1985675, 1985676, 1985677
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1985673, 1985674, 1985675, 1985676, 1985677
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1985673, 1985674, 1985675, 1985676, 1985677
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1985678, 1985679, 1985680, 1985681, 1985682
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1985678, 1985679, 1985680, 1985681, 1985682
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1985678, 1985679, 1985680, 1985681, 1985682
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1985678, 1985679, 1985680, 1985681, 1985682
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1985683, 1985684, 1985685, 1985686, 1985687
SM 2120 B / E31780	True Color measured at 450 nm	1985673, 1985674, 1985675, 1985676, 1985677
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1985673, 1985674, 1985675, 1985676, 1985677
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1985673, 1985674, 1985675, 1985676, 1985677
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1985673, 1985674, 1985675, 1985676, 1985677
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1985673, 1985674, 1985675, 1985676, 1985677
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1985678, 1985679, 1985680, 1985681, 1985682

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	04/18/2018			04/18/2018 16:38	William L. Brown IV	1985673, 1985674, 1985675, 1985676, 1985677
EPA 300.0 Rev. 2.1	04/18/2018			04/20/2018 02:56	Lipi Saha	1985673
	04/18/2018			04/20/2018 03:08	Lipi Saha	1985674
	04/18/2018			04/20/2018 14:03	Lipi Saha	1985676
	04/18/2018			04/20/2018 14:51	Lipi Saha	1985675
	04/18/2018			04/20/2018 15:03	Lipi Saha	1985677
EPA 350.1 Rev. 2.0	04/18/2018			04/24/2018 13:08	Ping Hua	1985678
	04/18/2018			04/24/2018 13:10	Ping Hua	1985679
	04/18/2018			04/24/2018 13:11	Ping Hua	1985681
	04/18/2018			04/24/2018 13:13	Ping Hua	1985682
	04/18/2018			04/24/2018 13:14	Ping Hua	1985680
EPA 351.2 Rev. 2.0	04/18/2018	04/20/2018 10:50	Adrian Shelby	04/24/2018 09:21	Joseph Suarez	1985678
	04/18/2018	04/20/2018 10:50	Adrian Shelby	04/24/2018 09:22	Joseph Suarez	1985679
	04/18/2018	04/20/2018 10:50	Adrian Shelby	04/24/2018 09:27	Joseph Suarez	1985680
	04/18/2018	04/20/2018 10:50	Adrian Shelby	04/24/2018 09:29	Joseph Suarez	1985681
	04/18/2018	04/20/2018 10:50	Adrian Shelby	04/24/2018 09:30	Joseph Suarez	1985682
EPA 353.2 Rev. 2.0	04/18/2018			04/23/2018 13:27	Lauren Bottorf	1985680
	04/18/2018			04/23/2018 13:29	Lauren Bottorf	1985678
	04/18/2018			04/23/2018 13:30	Lauren Bottorf	1985679
	04/18/2018			04/23/2018 13:34	Lauren Bottorf	1985682
	04/18/2018			04/23/2018 14:53	Lauren Bottorf	1985681
EPA 365.1 Rev. 2.0	04/18/2018	04/24/2018 15:27	Sima Feizi	04/25/2018 09:45	Beverly Y. Sanders	1985678
	04/18/2018	04/24/2018 15:27	Sima Feizi	04/25/2018 09:48	Beverly Y. Sanders	1985682
	04/18/2018	04/24/2018 15:27	Sima Feizi	04/25/2018 12:57	Beverly Y. Sanders	1985679
	04/18/2018	04/24/2018 15:27	Sima Feizi	04/25/2018 12:58	Beverly Y. Sanders	1985680
	04/18/2018	04/24/2018 15:27	Sima Feizi	04/25/2018 12:59	Beverly Y. Sanders	1985681
EPA 365.1 Rev. 2.0 dissolved	04/18/2018			04/18/2018 16:19	Megan Treadwell	1985683
	04/18/2018			04/18/2018 16:20	Megan Treadwell	1985684
	04/18/2018			04/18/2018 16:21	Megan Treadwell	1985685
	04/18/2018			04/18/2018 16:22	Megan Treadwell	1985686, 1985687
SM 2120 B	04/18/2018			04/19/2018 14:07	Tanya Welborn	1985673, 1985674
	04/18/2018			04/19/2018 14:08	Tanya Welborn	1985675
	04/18/2018			04/19/2018 14:09	Tanya Welborn	1985676
	04/18/2018			04/19/2018 14:10	Tanya Welborn	1985677
SM 2320 B-97	04/18/2018			04/28/2018 03:11	Dale L. Simmons	1985673
	04/18/2018			04/28/2018 03:21	Dale L. Simmons	1985674
	04/18/2018			04/28/2018 03:32	Dale L. Simmons	1985675
	04/18/2018			04/28/2018 03:43	Dale L. Simmons	1985676
	04/18/2018			04/28/2018 03:53	Dale L. Simmons	1985677

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2540 C-97	04/18/2018			04/24/2018 15:21	Yijie Li	1985673, 1985674, 1985675, 1985676, 1985677
SM 2540 D-97	04/18/2018			04/24/2018 15:21	Yijie Li	1985673, 1985674, 1985675, 1985676, 1985677
SM 4500 F-C-97	04/18/2018			04/28/2018 03:11	Dale L. Simmons	1985673
	04/18/2018			04/28/2018 03:21	Dale L. Simmons	1985674
	04/18/2018			04/28/2018 03:32	Dale L. Simmons	1985675
	04/18/2018			04/28/2018 03:43	Dale L. Simmons	1985676
	04/18/2018			04/28/2018 03:53	Dale L. Simmons	1985677
SM 5310 B-00	04/18/2018			04/24/2018 00:45	Megan Treadwell	1985678
	04/18/2018			04/24/2018 02:15	Megan Treadwell	1985679
	04/18/2018			04/24/2018 02:31	Megan Treadwell	1985680
	04/18/2018			04/24/2018 02:45	Megan Treadwell	1985681
	04/18/2018			04/24/2018 03:01	Megan Treadwell	1985682