

Chemical Analysis Report

TLH-ROC-2018-01-29-01

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

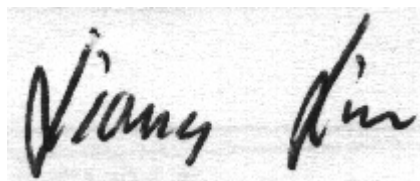
Event Description: **kit A w/ bacteria**
Request ID: **RQ-2018-01-29-48**
Customer: **TLH-ROC**
Project ID: **SMP**

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.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 15-FEB-2018 15:30

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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: CHIPOLA RIVER @ MAGNOLIA RD

Collection Date/Time: 01/29/2018 11:45

Field ID: G2TLHR0016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1962707	EPA 180.1 Rev. 2.0	Turbidity	13	A	NTU	P339053	
	EPA 300.0 Rev. 2.1	Chloride	4.4		mg Cl/L	P339114	
		Sulfate	2.1		mg SO4/L	P339112	
	SM 2120 B	Color (true)	22	A	PCU	P339024	
	SM 2320 B-97	Total Alkalinity	91		mg CaCO3/L	P339473	
	SM 2540 C-97	TDS	116		mg/L	P339396	
	SM 2540 D-97	TSS	8	I	mg/L	P339383	
	SM 4500 F-C-97	Fluoride	0.048	I	mg F/L	P339730	
1962713	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P339287	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.22		mg N/L	P339061	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.3		mg N/L	P339035	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P339029	
	SM 5310 B-00	Organic Carbon	2.8		mg C/L	P339238	
1962719	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P339047	

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: Blue Hole Spring @ Caverns State Park

Collection Date/Time: 01/29/2018 12:25

Field ID: G2TLHR0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1962708	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P339053	
	EPA 300.0 Rev. 2.1	Chloride	3.1		mg Cl/L	P339114	
		Sulfate	1.2		mg SO4/L	P339112	
	SM 2120 B	Color (true)	2.5	U	PCU	P339024	
	SM 2320 B-97	Total Alkalinity	152		mg CaCO3/L	P339473	
	SM 2540 C-97	TDS	165		mg/L	P339397	
	SM 2540 D-97	TSS	3	I	mg/L	P339384	
	SM 4500 F-C-97	Fluoride	0.076	I	mg F/L	P339730	
1962714	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P339287	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.18	I	mg N/L	P339061	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.40		mg N/L	P339146	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P339029	
	SM 5310 B-00	Organic Carbon	0.64	I	mg C/L	P339238	
1962720	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P339047	

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: Blue Hole Spring @ Caverns State Park

Collection Date/Time: 01/29/2018 12:30

Field ID: G2TLHR0009DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1962709	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P339053	
	EPA 300.0 Rev. 2.1	Chloride	3.2		mg Cl/L	P339114	
		Sulfate	1.2		mg SO4/L	P339112	

Field ID: G2TLHR0009DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1962709	SM 2120 B	Color (true)	2.5	U	PCU	P339024	
	SM 2320 B-97	Total Alkalinity	150		mg CaCO3/L	P339473	
	SM 2540 C-97	TDS	154		mg/L	P339397	
	SM 2540 D-97	TSS	2	I	mg/L	P339384	
	SM 4500 F-C-97	Fluoride	0.073	I	mg F/L	P339730	
1962715	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P339287	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P339061	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.40		mg N/L	P339075	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P339029	
	SM 5310 B-00	Organic Carbon	0.61	I	mg C/L	P339238	
1962721	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P339047	

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: QA/QC FIELD BLANK CARBOY

Collection Date/Time: 01/29/2018 12:35

Field ID: BLANK_JAN

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1962710	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P339053	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P339114	
		Sulfate	0.20	U	mg SO4/L	P339112	
	SM 2120 B	Color (true)	2.5	U	PCU	P339024	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P339473	
	SM 2540 C-97	TDS	15	U	mg/L	P339395	
	SM 2540 D-97	TSS	2	U	mg/L	P339382	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P339730	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P339287	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P339061	
1962716	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P339035	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P339029	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P339238	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P339047	

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: Russ Mill Crk @ Union Rd

Collection Date/Time: 01/29/2018 13:20

Field ID: G2TLHR0037

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1962711	EPA 180.1 Rev. 2.0	Turbidity	4.9		NTU	P339053	
	EPA 300.0 Rev. 2.1	Chloride	4.2		mg Cl/L	P339114	
		Sulfate	5.2		mg SO4/L	P339112	
	SM 2120 B	Color (true)	39		PCU	P339024	
	SM 2320 B-97	Total Alkalinity	91		mg CaCO3/L	P339473	
	SM 2540 C-97	TDS	124		mg/L	P339397	
	SM 2540 D-97	TSS	3	I	mg/L	P339384	

Field ID: G2TLHR0037

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1962711	SM 4500 F-C-97	Fluoride	0.043	I	mg F/L	P339730	
1962717	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P339287	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P339061	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P339075	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P339029	
	SM 5310 B-00	Organic Carbon	6.6		mg C/L	P339238	
1962723	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P339047	

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: MARSHALL CREEK @ SR2

Collection Date/Time: 01/29/2018 14:00

Field ID: G2TLHR0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1962712	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P339053	
	EPA 300.0 Rev. 2.1	Chloride	5.7		mg Cl/L	P339114	
		Sulfate	2.0		mg SO4/L	P339112	
	SM 2120 B	Color (true)	49		PCU	P339024	
	SM 2320 B-97	Total Alkalinity	59		mg CaCO3/L	P339473	
	SM 2540 C-97	TDS	85		mg/L	P339397	
	SM 2540 D-97	TSS	6	I	mg/L	P339384	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P339730	
1962718	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P339287	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P339061	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.32		mg N/L	P339075	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P339029	
	SM 5310 B-00	Organic Carbon	6.4		mg C/L	P339238	
1962724	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P339047	

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: P339053

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P339112

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339114

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339287

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339061

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339035

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339075

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339146

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339029

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339047

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

Reference Method: SM 2120 B
Batch ID: P339024

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P339473

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P339395

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P339396

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P339397

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P339382

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P339383

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P339384

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P339730

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P339238

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: P339112

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P339114

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P339287

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P339061

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: P339035

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P339075

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P339146

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P339029

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P339047

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P339473

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.6		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P339730

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.8		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P339238

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339112

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962772	Sulfate	95.4		P	90 - 110
1962807	Sulfate	93.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339114

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962772	Chloride	96.5		P	90 - 110
1962807	Chloride	91.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339287

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962713	Ammonia-N	96.7	94.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339061

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962713	Kjeldahl Nitrogen	105	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339035

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1961366	NO2NO3-N	103	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962717	NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339146

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962948	NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962713	Total-P	109	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339047

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962719	O-Phosphate-P	98.6	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P339730

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962708	Fluoride	96.2	96.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P339238

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1962478	Organic Carbon	100	96.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P339053

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962707	Turbidity	0.766	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339112

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962807	Sulfate	3.64	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339114

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962807	Chloride	2.97	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339287

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962713	Ammonia-N	1.50	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339061

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962713	Kjeldahl Nitrogen	3.52	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339035

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1961366	NO2NO3-N	0.623	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962717	NO2NO3-N	0.631	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339146

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962948	NO2NO3-N	1.45	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962713	Total-P	4.77	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339047

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962719	O-Phosphate-P	1.45	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P339024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962707	Color (true)	1.37	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P339473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962831	Total Alkalinity	0.200	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P339395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962405	TDS	4.40	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P339396

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962444	TDS	8.16	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P339397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962744	TDS	5.13	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P339730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962708	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P339238

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1962478	Organic Carbon	2.30	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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A81737

Included Lab Sample IDs: 1962707, 1962708, 1962709, 1962710, 1962711, 1962712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.6	104	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A81746

Included Lab Sample IDs: 1962719, 1962720, 1962721, 1962722, 1962723, 1962724

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110
O-Phosphate-P	99.3	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A81750

Included Lab Sample IDs: 1962707, 1962708, 1962709, 1962710, 1962711, 1962712

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A81759

Included Lab Sample IDs: 1962715, 1962717, 1962718

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A81760

Included Lab Sample IDs: 1962713, 1962714, 1962715, 1962716, 1962717, 1962718

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A81775

Included Lab Sample IDs: 1962707, 1962708, 1962709, 1962710, 1962711, 1962712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	100	P/P	90 - 110
Chloride	100	102	P/P	90 - 110
Sulfate	99.7	100	P/P	90 - 110
Sulfate	99.7	99.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A81787

Included Lab Sample IDs: 1962714

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A81788

Included Lab Sample IDs: 1962713, 1962716

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A81818

Included Lab Sample IDs: 1962713, 1962714, 1962715, 1962716, 1962717, 1962718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	103	P/P	90 - 110
Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A81820

Included Lab Sample IDs: 1962713, 1962714, 1962715, 1962716, 1962717, 1962718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.8	99.2	P/P	90 - 110
Organic Carbon	99.2	98.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A81838

Included Lab Sample IDs: 1962713, 1962714, 1962715, 1962716, 1962717, 1962718

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

Reference Method: SM 2320 B-97

Run ID: A81901

Included Lab Sample IDs: 1962707, 1962708, 1962709, 1962710, 1962711, 1962712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.5	97.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A81981

Included Lab Sample IDs: 1962707, 1962708, 1962709, 1962710, 1962711, 1962712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.1	101	P/P	90 - 110
Fluoride	99.1	97.1	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	MS
EPA 180.1 Rev. 2.0	Turbidity				0.766	
EPA 300.0 Rev. 2.1	Chloride	95.7	91.5	96.5	2.97	
	Sulfate	94.9	93.3	95.4	3.64	
EPA 350.1 Rev. 2.0	Ammonia-N	96.2	96.7	94.8		1.50
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	105	109		3.52
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	105	103	104		0.631
	NO ₂ NO ₃ -N	104	102	101		0.631
	NO ₂ NO ₃ -N	104	104	103		1.45
EPA 365.1 Rev. 2.0	Total-P	106	109	103		4.77
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	98.6	100		1.45
SM 2120 B	Color (true)				1.37	
SM 2320 B-97	Total Alkalinity	97.6			0.200	
SM 2540 C-97	TDS				4.40	
	TDS				8.16	
	TDS				5.13	
SM 4500 F-C-97	Fluoride	96.8	96.2	96.2		0.0
SM 5310 B-00	Organic Carbon	94.8	100	96.0		2.30

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1962713, 1962714, 1962715, 1962716, 1962717, 1962718
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1962713, 1962714, 1962715, 1962716, 1962717, 1962718
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1962713, 1962714, 1962715, 1962716, 1962717, 1962718
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1962713, 1962714, 1962715, 1962716, 1962717, 1962718
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1962719, 1962720, 1962721, 1962722, 1962723, 1962724
SM 2120 B / E31780	True Color measured at 450 nm	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1962713, 1962714, 1962715, 1962716, 1962717, 1962718

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	01/29/2018			01/30/2018 15:36	DeAsia Armster	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
EPA 300.0 Rev. 2.1	01/29/2018			01/31/2018	Julia Storbeck	1962707, 1962708, 1962709, 1962710, 1962711
	01/29/2018			02/01/2018	Julia Storbeck	1962712
EPA 350.1 Rev. 2.0	01/29/2018			02/02/2018	Ping Hua	1962713, 1962714, 1962715, 1962716, 1962717, 1962718
EPA 351.2 Rev. 2.0	01/29/2018	01/31/2018	Adrian Shelby	02/02/2018	Joseph Suarez	1962713, 1962714, 1962715, 1962716, 1962717, 1962718
EPA 353.2 Rev. 2.0	01/29/2018			01/30/2018	Lauren Bottorf	1962713, 1962716
	01/29/2018			01/31/2018	Beverly Y. Sanders	1962715, 1962717, 1962718
	01/29/2018			02/01/2018	Beverly Y. Sanders	1962714
EPA 365.1 Rev. 2.0	01/29/2018	01/30/2018	Sima Feizi	01/31/2018	Lipi Saha	1962713, 1962714, 1962715, 1962716, 1962717, 1962718
EPA 365.1 Rev. 2.0 dissolved	01/29/2018			01/30/2018 14:56	Megan Treadwell	1962719
	01/29/2018			01/30/2018 15:12	Megan Treadwell	1962720
	01/29/2018			01/30/2018 15:13	Megan Treadwell	1962721, 1962722
	01/29/2018			01/30/2018 15:14	Megan Treadwell	1962723
	01/29/2018			01/30/2018 15:15	Megan Treadwell	1962724
SM 2120 B	01/29/2018			01/30/2018 14:52	Blanca Fach	1962707
	01/29/2018			01/30/2018 14:53	Blanca Fach	1962708
	01/29/2018			01/30/2018 14:54	Blanca Fach	1962709, 1962710
	01/29/2018			01/30/2018 14:55	Blanca Fach	1962711
	01/29/2018			01/30/2018 14:56	Blanca Fach	1962712
SM 2320 B-97	01/29/2018			02/06/2018	Lauren Bottorf	1962707, 1962708, 1962709
	01/29/2018			02/07/2018	Lauren Bottorf	1962710, 1962711, 1962712
SM 2540 C-97	01/29/2018			01/31/2018	Yijie Li	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
SM 2540 D-97	01/29/2018			01/31/2018	Yijie Li	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
SM 4500 F-C-97	01/29/2018			02/10/2018	Lauren Bottorf	1962707, 1962708, 1962709, 1962710, 1962711, 1962712
SM 5310 B-00	01/29/2018			02/02/2018	Megan Treadwell	1962713, 1962714, 1962715, 1962716, 1962717, 1962718