

Chemical Analysis Report

BSSP-2018-08-23-01

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

Event Description: **Reference Lake Sampling**
Request ID: **RQ-2018-08-20-62**
Customer: **BSSP**
Project ID: **LAKESREF**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 11-SEP-2018 11:28

A handwritten signature in black ink, appearing to read "Liang Lin", 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 groups are included in this report: Metals and 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: LOST LAKE ALT

Collection Date/Time: 08/23/2018 15:05

Field ID: LOST LAKE ALT

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2019951	EPA 300.0	Bromide	0.013	U	mg Br/L	P350780	
	EPA 300.0 Rev. 2.1	Chloride	2.0		mg Cl/L	P350933	
		Sulfate	0.62		mg SO4/L	P350935	
		Color (true)	9.0		PCU	P350729	
	SM 2320 B-97	Total Alkalinity	0.89	I	mg CaCO3/L	P351143	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P351052	
2019953	EPA 350.1 Rev. 2.0	Ammonia-N	0.027		mg N/L	P350916	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P350825	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351125	
	EPA 365.1 Rev. 2.0	Total-P	0.007		mg P/L	P350910	
2019955	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P350697	
2019961	EPA 200.7 Rev. 4.4	Calcium	0.40		mg/L	P350867	
		Iron	75	I	ug/L	P350867	
		Magnesium	0.28		mg/L	P350867	
		Potassium	0.30	U	mg/L	P350867	
		Sodium	1.1	I	mg/L	P350867	
		Zinc	5.0	U	ug/L	P350867	
	EPA 200.8 Rev. 5.4	Arsenic	0.48		ug/L	P350867	
		Cadmium	0.020	U	ug/L	P350867	
		Chromium	0.40	U	ug/L	P350867	
		Copper	0.20	U	ug/L	P350867	
		Lead	0.13	I	ug/L	P350867	
		Nickel	0.20	U	ug/L	P350867	
		Silver	0.010	U	ug/L	P350867	

Sample Location: UNNAMED SMALL LAKE

Collection Date/Time: 08/23/2018 11:55

Field ID: ANF UNNAMED SMALL LAKE REF

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2019952	EPA 300.0	Bromide	0.013	U	mg Br/L	P350780	
	EPA 300.0 Rev. 2.1	Chloride	1.7		mg Cl/L	P350933	
		Sulfate	0.20	U	mg SO4/L	P350935	
		Color (true)	44		PCU	P350729	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P351143	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P351052	
2019954	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P350916	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P350825	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P350857	
	EPA 365.1 Rev. 2.0	Total-P	0.01		mg P/L	P350910	
2019956	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P350697	
2019962	EPA 200.7 Rev. 4.4	Calcium	0.20	I	mg/L	P350867	
		Iron	97	I	ug/L	P350867	
		Magnesium	0.17		mg/L	P350867	
		Potassium	0.30	U	mg/L	P350867	
		Sodium	0.92	I	mg/L	P350867	
		Zinc	5.0	U	ug/L	P350867	
	EPA 200.8 Rev. 5.4	Arsenic	0.15	I	ug/L	P350867	
		Cadmium	0.020	U	ug/L	P350867	
		Chromium	0.40	U	ug/L	P350867	
		Copper	0.20	U	ug/L	P350867	
		Lead	0.36		ug/L	P350867	
		Nickel	0.20	U	ug/L	P350867	
		Silver	0.010	U	ug/L	P350867	

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350867

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350867

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0
Batch ID: P350780

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350933

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350935

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350916

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350825

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350857

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351125

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350910

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350697

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

Reference Method: SM 2120 B
Batch ID: P350729

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P351143

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

Reference Method: SM 4500 F-C-97
Batch ID: P351052

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350867

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	108		P	85 - 115
Iron	106		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	98.1		P	85 - 115
Sodium	102		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350867

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.4		P	85 - 115
Cadmium	99.0		P	85 - 115
Chromium	96.6		P	85 - 115
Copper	94.8		P	85 - 115
Lead	97.8		P	85 - 115
Nickel	96.0		P	85 - 115
Silver	96.5		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P350780

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350933

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350935

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350916

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350825

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350857

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: P351125

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350910

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350697

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

Reference Method: SM 2120 B
Batch ID: P350729

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.4		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P351143

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P351052

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350867

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019961	Calcium	109	106	P/P	80 - 120
2019961	Iron	106	103	P/P	80 - 120
2019961	Magnesium	109	106	P/P	80 - 120
2019961	Potassium	104	101	P/P	80 - 120
2019961	Sodium	99.7	97.7	P/P	80 - 120
2019961	Zinc	102	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350867

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019961	Arsenic	102	102	P/P	80 - 120
2019961	Cadmium	102	102	P/P	80 - 120
2019961	Chromium	99.0	99.2	P/P	80 - 120
2019961	Copper	98.3	98.2	P/P	80 - 120
2019961	Lead	100	99.3	P/P	80 - 120
2019961	Nickel	98.6	98.2	P/P	80 - 120
2019961	Silver	98.3	97.8	P/P	80 - 120

Reference Method: EPA 300.0
Batch ID: P350780

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019951	Bromide	98.0	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350933

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019572	Chloride	107		P	90 - 110
2019922	Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019572	Sulfate	106		P	90 - 110
2019922	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350916

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019953	Ammonia-N	96.3	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350825

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019693	Kjeldahl Nitrogen	91.0	94.7	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019692	NO2NO3-N	98.0	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351125

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020368	NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019918	Total-P	100	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019637	O-Phosphate-P	93.9	95.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P351052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020073	Fluoride	98.1	98.3	P/P	91 - 105

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019961	Calcium	2.19	Spike	P	0 - 20
2019961	Iron	2.64	Spike	P	0 - 20
2019961	Magnesium	2.60	Spike	P	0 - 20
2019961	Potassium	2.20	Spike	P	0 - 20
2019961	Sodium	1.57	Spike	P	0 - 20
2019961	Zinc	0.193	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019961	Arsenic	0.243	Spike	P	0 - 20
2019961	Cadmium	0.615	Spike	P	0 - 20
2019961	Chromium	0.173	Spike	P	0 - 20
2019961	Copper	0.178	Spike	P	0 - 20
2019961	Lead	1.05	Spike	P	0 - 20
2019961	Nickel	0.336	Spike	P	0 - 20
2019961	Silver	0.542	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P350780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019951	Bromide	1.54	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019572	Chloride	3.75	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019572	Sulfate	4.20	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350916

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019953	Ammonia-N	0.346	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019693	Kjeldahl Nitrogen	2.61	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019692	NO2NO3-N	2.02	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351125

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020368	NO2NO3-N	1.23	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019918	Total-P	0.492	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019637	O-Phosphate-P	1.27	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P350729

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019925	Color (true)	2.73	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P351143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020073	Total Alkalinity	0.102	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P351052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020073	Fluoride	0.477	Spike	P	0 - 3.5

Quality Assurance Report

Precision

* 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

Run ID: A86045

Included Lab Sample IDs: 2019951, 2019952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	99.8	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A86099

Included Lab Sample IDs: 2019955, 2019956

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.2	97.5	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A86107

Included Lab Sample IDs: 2019951, 2019952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.8	97.4	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86155

Included Lab Sample IDs: 2019954

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86169

Included Lab Sample IDs: 2019953, 2019954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.6	96.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86185

Included Lab Sample IDs: 2019953, 2019954

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A86194

Included Lab Sample IDs: 2019951, 2019952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	107	P/P	90 - 110
Sulfate	102	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86208

Included Lab Sample IDs: 2019953, 2019954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	99.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86211

Included Lab Sample IDs: 2019961, 2019962

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	105	107	P/P	90 - 110
Iron	104	103	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Potassium	97.8	96.7	P/P	90 - 110
Sodium	99.4	98.6	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86251

Included Lab Sample IDs: 2019961, 2019962

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.5	95.6	P/P	90 - 110
Cadmium	95.4	94.2	P/P	90 - 110
Chromium	93.8	95.6	P/P	90 - 110
Copper	93.4	93.1	P/P	90 - 110
Lead	102	100	P/P	90 - 110
Nickel	93.3	94.2	P/P	90 - 110
Silver	95.3	93.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A86252

Included Lab Sample IDs: 2019951, 2019952

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86298

Included Lab Sample IDs: 2019953

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

Reference Method: SM 2320 B-97

Run ID: A86303

Included Lab Sample IDs: 2019951, 2019952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	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 SMP	MS
			LCS			
EPA 200.7 Rev. 4.4	Calcium	108	109	106		2.19
	Iron	106	106	103		2.64
	Magnesium	108	109	106		2.60
	Potassium	98.1	104	101		2.20
	Sodium	102	99.7	97.7		1.57
	Zinc	101	102	102		0.193
EPA 200.8 Rev. 5.4	Arsenic	98.4	102	102		0.243
	Cadmium	99.0	102	102		0.615
	Chromium	96.6	99.0	99.2		0.173
	Copper	94.8	98.3	98.2		0.178
	Lead	97.8	100	99.3		1.05
	Nickel	96.0	98.6	98.2		0.336
	Silver	96.5	98.3	97.8		0.542
EPA 300.0	Bromide	100	98.0	99.5		1.54
EPA 300.0 Rev. 2.1	Chloride	107	107	104	3.75	
	Sulfate	104	106	102	4.20	
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	96.3	96.8		0.346
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	91.0	94.7		2.61
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.0	100		2.02
	NO ₂ NO ₃ -N	99.5	100			1.23
EPA 365.1 Rev. 2.0	Total-P	102	100	99.6		0.492
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.0	93.9	95.1		1.27
SM 2120 B	Color (true)	96.4			2.73	
SM 2320 B-97	Total Alkalinity	103			0.102	
SM 4500 F-C-97	Fluoride	97.7	98.1	98.3		0.477

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2019961, 2019962
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2019961, 2019962
EPA 300.0 / E31780	Bromide in aqueous matrices	2019951, 2019952
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2019951, 2019952
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2019951, 2019952
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2019953, 2019954
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2019953, 2019954
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2019953, 2019954
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2019953, 2019954
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2019955, 2019956
SM 2120 B / E31780	True Color measured at 450 nm	2019951, 2019952
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2019951, 2019952
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2019951, 2019952

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	08/23/2018	08/28/2018 17:10	Elliott D. Healy	08/30/2018 13:34	Betina Topolski	2019961
	08/23/2018	08/28/2018 17:10	Elliott D. Healy	08/30/2018 13:55	Betina Topolski	2019962
EPA 200.8 Rev. 5.4	08/23/2018	08/28/2018 17:10	Elliott D. Healy	08/31/2018 20:45	Allison Taylor	2019961
	08/23/2018	08/28/2018 17:10	Elliott D. Healy	08/31/2018 21:14	Allison Taylor	2019962
EPA 300.0	08/23/2018			08/24/2018 11:27	Lipi Saha	2019951
	08/23/2018			08/24/2018 12:18	Lipi Saha	2019952
EPA 300.0 Rev. 2.1	08/23/2018			08/30/2018 02:09	Lipi Saha	2019951
	08/23/2018			08/30/2018 02:21	Lipi Saha	2019952
EPA 350.1 Rev. 2.0	08/23/2018			08/29/2018 12:33	Ping Hua	2019953
	08/23/2018			08/29/2018 12:37	Ping Hua	2019954
EPA 351.2 Rev. 2.0	08/23/2018	08/28/2018 11:00	Adrian Shelby	08/29/2018 11:04	Joseph Suarez	2019953
	08/23/2018	08/28/2018 11:00	Adrian Shelby	08/29/2018 11:06	Joseph Suarez	2019954
EPA 353.2 Rev. 2.0	08/23/2018			08/28/2018 13:25	Lauren Bottorf	2019954
	08/23/2018			09/05/2018 13:20	Lauren Bottorf	2019953
EPA 365.1 Rev. 2.0	08/23/2018	08/29/2018 13:20	Sima Feizi	08/30/2018 12:30	Beverly Y. Sanders	2019953
	08/23/2018	08/29/2018 13:20	Sima Feizi	08/30/2018 12:31	Beverly Y. Sanders	2019954
EPA 365.1 Rev. 2.0 dissolved	08/23/2018			08/23/2018 16:40	Julia Storbeck	2019955
	08/23/2018			08/23/2018 16:41	Julia Storbeck	2019956
SM 2120 B	08/23/2018			08/24/2018 15:51	Julia Storbeck	2019951
	08/23/2018			08/24/2018 15:52	Julia Storbeck	2019952
SM 2320 B-97	08/23/2018			09/05/2018 18:44	Dale L. Simmons	2019951
	08/23/2018			09/05/2018 18:49	Dale L. Simmons	2019952
SM 4500 F-C-97	08/23/2018			08/31/2018 02:45	Dale L. Simmons	2019951
	08/23/2018			08/31/2018 02:54	Dale L. Simmons	2019952