Chemical Analysis Report

SW-DIST-2020-10-13-01

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

Event Description: **Run 13 lakes**
Request ID: **RQ-2020-10-19-10**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 30-OCT-2020 15:54

B. Steinbock

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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Lake Ida @ Center **Collection Date/Time: 10/12/2020 10:55**

Field ID: G3SW0043 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2201327	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P388593	
	EPA 300.0 Rev. 2.1	Chloride	32		mg Cl/L	P388999	
	SM 2120 B-2011	Color (true)	38		PCU	P388684	
	SM 2320 B-2011	Total Alkalinity	74	A	mg CaCO3/L	P388941	
	SM 2540 C-2011	TDS	154		mg/L	P389264	
	SM 2540 D-2011	TSS	3	I	mg/L	P389159	
	SM 4500 F-C-2011	Fluoride	0.13		mg F/L	P388955	
2201330	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P388835	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P388754	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388799	
	EPA 365.1 Rev. 2.0	Total-P	0.043		mg P/L	P388640	
	SM 5310 B-2011	Organic Carbon	8.4		mg C/L	P388725	
2201333	EPA 300.0 Rev. 2.1 dissolved	Sulfate	16		mg SO4/L	P389334	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P388602	
2201339	EPA 200.7 Rev. 4.4	Barium	18.9		ug/L	P388667	
		Calcium	28.3		mg/L	P388667	
		Iron	30	U	ug/L	P388667	
		Magnesium	3.25		mg/L	P388667	
		Potassium	6.0		mg/L	P388667	
		Sodium	24.0		mg/L	P388667	
		Zinc	5.0	U	ug/L	P388667	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P388667	
		Antimony	0.20	I	ug/L	P388667	
		Arsenic	1.17		ug/L	P388667	
		Boron**	53.2		ug/L	P388667	
		Cadmium	0.020	U	ug/L	P388667	
		Chromium	0.40	U	ug/L	P388667	
		Copper	0.63	I	ug/L	P388667	
		Lead	0.20	U	ug/L	P388667	
		Nickel	0.50	U	ug/L	P388667	
		Selenium	0.20	U	ug/L	P388667	
		Silver	0.010	U	ug/L	P388667	
		Thallium	0.10	U	ug/L	P388667	
	SM 2340B	Hardness	84.0		mg/L	P388667	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: FB101220 **Collection Date/Time: 10/12/2020 09:00**

Field ID: FB101220 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2201328	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P388593	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P389331	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P388684	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P388941	
	SM 2540 C-2011	TDS	15	U	mg/L	P389264	
	SM 2540 D-2011	TSS	2	U	mg/L	P389159	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P388955	
2201331	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P388835	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P388754	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388799	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P388640	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P388879	
2201334	EPA 300.0 Rev. 2.1 dissolved	Sulfate	0.20	U	mg SO4/L	P389334	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P388602	
2201340	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P388667	
		Calcium	0.075	U	mg/L	P388667	
		Iron	30	U	ug/L	P388667	
		Magnesium	0.040	U	mg/L	P388667	
		Potassium	0.30	U	mg/L	P388667	
		Sodium	0.50	U	mg/L	P388667	
		Zinc	5.0	U	ug/L	P388667	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P388667	
		Antimony	0.050	U	ug/L	P388667	
		Arsenic	0.050	U	ug/L	P388667	
		Boron**	2.0	U	ug/L	P388667	
		Cadmium	0.020	U	ug/L	P388667	
		Chromium	0.40	U	ug/L	P388667	
		Copper	0.40	U	ug/L	P388667	
		Lead	0.20	U	ug/L	P388667	
		Nickel	0.50	U	ug/L	P388667	
		Selenium	0.20	U	ug/L	P388667	
		Silver	0.010	U	ug/L	P388667	
		Thallium	0.10	U	ug/L	P388667	
	SM 2340B	Hardness	0.35	U	mg/L	P388667	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Van @ Center **Collection Date/Time: 10/12/2020 10:15**

Field ID: G4SW0106 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2201329	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P388593	
	EPA 300.0 Rev. 2.1	Chloride	22	A	mg Cl/L	P389331	
	SM 2120 B-2011	Color (true)	85		PCU	P388684	
	SM 2320 B-2011	Total Alkalinity	14		mg CaCO3/L	P388941	
	SM 2540 C-2011	TDS	97		mg/L	P389264	
	SM 2540 D-2011	TSS	4	I	mg/L	P389159	
	SM 4500 F-C-2011	Fluoride	0.26		mg F/L	P388955	
2201332	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P388835	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P388754	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388799	
	EPA 365.1 Rev. 2.0	Total-P	0.059		mg P/L	P388640	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P388879	
2201335	EPA 300.0 Rev. 2.1 dissolved	Sulfate	18		mg SO4/L	P389334	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.020		mg P/L	P388602	

Ref. Method and Comment:
SM 2540 D-2011: 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: P388593

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388667

Component	Result	Code	Units
Barium	1.0	U	ug/L
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: P388667

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388999

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389331

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P389334

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: P388835

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388754

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388799

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388640

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388602

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

Reference Method: SM 2120 B-2011
Batch ID: P388684

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P388941

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

Reference Method: SM 2540 C-2011
Batch ID: P389264

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P389159

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P388955

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P388725

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-2011
Batch ID: P388879

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388667

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	105		P	85 - 115
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	103		P	85 - 115
Sodium	106		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388667

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	101		P	85 - 115
Boron	103		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	100		P	85 - 115
Copper	101		P	85 - 115
Lead	97.8		P	85 - 115
Nickel	99.8		P	85 - 115
Selenium	99.1		P	85 - 115
Silver	99.9		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388999

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389331

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P389334

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388835

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388754

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388799

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388640

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388602

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

Reference Method: SM 2120 B-2011
Batch ID: P388684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.6		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P388941

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P388955

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.5		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P388725

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.6		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P388879

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388667

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201859	Barium	104	103	P/P	80 - 120
2201859	Calcium	106	101	P/P	80 - 120
2201859	Iron	108	103	P/P	80 - 120
2201859	Magnesium	108	104	P/P	80 - 120
2201859	Potassium	102	100	P/P	80 - 120
2201859	Sodium	102	101	P/P	80 - 120
2201859	Zinc	102	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388667

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201859	Aluminum	102	104	P/P	80 - 120
2201859	Antimony	102	100	P/P	80 - 120
2201859	Arsenic	100	101	P/P	80 - 120
2201859	Boron	104	104	P/P	80 - 120
2201859	Cadmium	104	105	P/P	80 - 120
2201859	Chromium	98.8	98.9	P/P	80 - 120
2201859	Copper	101	101	P/P	80 - 120
2201859	Lead	99.0	98.6	P/P	80 - 120
2201859	Nickel	101	100	P/P	80 - 120
2201859	Selenium	98.6	99.4	P/P	80 - 120
2201859	Silver	99.8	98.8	P/P	80 - 120
2201859	Thallium	103	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388999

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201191	Chloride	98.2		P	90 - 110
2201344	Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201329	Chloride	102		P	90 - 110
2201745	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P389334

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201329	Sulfate	102		P	90 - 110
2201745	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388835

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201330	Ammonia-N	98.5	97.6	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388754

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201348	Kjeldahl Nitrogen	107	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388799

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201249	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388640

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201249	Total-P	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388602

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201333	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P388955

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201327	Fluoride	100	100	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P388725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201026	Organic Carbon	105		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P388879

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201468	Organic Carbon	93.4	96.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388593

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201276	Turbidity	3.73	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388667

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201859	Barium	1.46	Spike	P	0 - 20
2201859	Calcium	3.95	Spike	P	0 - 20
2201859	Iron	3.78	Spike	P	0 - 20
2201859	Magnesium	3.03	Spike	P	0 - 20
2201859	Potassium	1.79	Spike	P	0 - 20
2201859	Sodium	0.732	Spike	P	0 - 20
2201859	Zinc	1.40	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388667

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201859	Aluminum	1.36	Spike	P	0 - 20
2201859	Antimony	1.05	Spike	P	0 - 20
2201859	Arsenic	0.748	Spike	P	0 - 20
2201859	Boron	0.540	Spike	P	0 - 20
2201859	Cadmium	0.263	Spike	P	0 - 20
2201859	Chromium	0.139	Spike	P	0 - 20
2201859	Copper	0.0152	Spike	P	0 - 20
2201859	Lead	0.414	Spike	P	0 - 20
2201859	Nickel	0.920	Spike	P	0 - 20
2201859	Selenium	0.901	Spike	P	0 - 20
2201859	Silver	1.03	Spike	P	0 - 20
2201859	Thallium	0.619	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388999

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201191	Chloride	0.317	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201329	Chloride	0.0720	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P389334

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201329	Sulfate	0.0163	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201330	Ammonia-N	0.812	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388754

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201348	Kjeldahl Nitrogen	1.50	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201249	NO2NO3-N	0.329	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388640

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201249	Total-P	0.793	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388602

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201333	O-Phosphate-P	0.399	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P388684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201345	Color (true)	18.0	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P388941

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201327	Total Alkalinity	1.60	Sample	P	0 - 8.1

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P389264

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201248	TDS	5.93	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P388955

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201327	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P388725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201026	Organic Carbon	0.540	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P388879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201468	Organic Carbon	1.84	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A101491
Included Lab Sample IDs: 2201327, 2201328, 2201329

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A101494
Included Lab Sample IDs: 2201333, 2201334, 2201335

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	99.5	100	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A101521
Included Lab Sample IDs: 2201327, 2201328, 2201329

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A101535
Included Lab Sample IDs: 2201330, 2201331, 2201332

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

Reference Method: SM 5310 B-2011
Run ID: A101541
Included Lab Sample IDs: 2201330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	104	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101548
Included Lab Sample IDs: 2201339, 2201340

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	102	P/P	95 - 105
Calcium	98.3	99.0	P/P	95 - 105
Iron	99.6	99.7	P/P	95 - 105
Magnesium	98.5	98.9	P/P	95 - 105
Potassium	97.2	97.0	P/P	95 - 105
Sodium	98.0	98.5	P/P	95 - 105
Zinc	101	102	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101552
Included Lab Sample IDs: 2201332

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	95.3	95.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A101572
Included Lab Sample IDs: 2201330, 2201331, 2201332

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.8	P/P	90 - 110
Ammonia-N	101	100	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A101587
Included Lab Sample IDs: 2201331, 2201332

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.6	93.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101595
Included Lab Sample IDs: 2201330, 2201331

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	93.0	91.8	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A101630
Included Lab Sample IDs: 2201327, 2201328, 2201329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.8	104	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A101630
Included Lab Sample IDs: 2201327, 2201328, 2201329

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A101649
Included Lab Sample IDs: 2201327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101659
Included Lab Sample IDs: 2201330, 2201331, 2201332

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101737
Included Lab Sample IDs: 2201339, 2201340

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.8	97.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101737
Included Lab Sample IDs: 2201339, 2201340

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.1	97.8	P/P	90 - 110
Antimony	98.4	97.5	P/P	90 - 110
Antimony	98.6	98.4	P/P	90 - 110
Arsenic	97.1	95.9	P/P	90 - 110
Arsenic	99.3	97.1	P/P	90 - 110
Boron	102	103	P/P	90 - 110
Boron	103	101	P/P	90 - 110
Cadmium	98.9	99.0	P/P	90 - 110
Cadmium	99.0	98.3	P/P	90 - 110
Chromium	94.4	94.8	P/P	90 - 110
Chromium	95.6	94.4	P/P	90 - 110
Copper	94.7	95.7	P/P	90 - 110
Copper	98.9	94.7	P/P	90 - 110
Lead	96.3	95.5	P/P	90 - 110
Lead	97.0	96.3	P/P	90 - 110
Nickel	93.8	94.9	P/P	90 - 110
Nickel	98.0	93.8	P/P	90 - 110
Selenium	96.6	96.6	P/P	90 - 110
Selenium	97.0	96.6	P/P	90 - 110
Silver	101	99.9	P/P	90 - 110
Silver	99.9	99.1	P/P	90 - 110
Thallium	95.3	93.6	P/P	90 - 110
Thallium	95.7	95.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A101798
Included Lab Sample IDs: 2201328, 2201329

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Run ID: A101798
Included Lab Sample IDs: 2201333, 2201334, 2201335

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	102	102	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					3.73	
EPA 200.7 Rev. 4.4	Barium	105	104	103			1.46
	Calcium	106	106	101			3.95
	Iron	105	108	103			3.78
	Magnesium	105	108	104			3.03
	Potassium	103	102	100			1.79
	Sodium	106	102	101			0.732
	Zinc	102	102	101			1.40
EPA 200.8 Rev. 5.4	Aluminum	102	102	104			1.36
	Antimony	102	102	100			1.05
	Arsenic	101	100	101			0.748
	Boron	103	104	104			0.540
	Cadmium	102	104	105			0.263
	Chromium	100	98.8	98.9			0.139
	Copper	101	101	101			0.0152
	Lead	97.8	99.0	98.6			0.414
	Nickel	99.8	101	100			0.920
	Selenium	99.1	98.6	99.4			0.901
	Silver	99.9	99.8	98.8			1.03
	Thallium	100	103	104			0.619
EPA 300.0 Rev. 2.1	Chloride	100	98.2	99.3		0.317	
	Chloride	99.4	102	102		0.0720	
EPA 300.0 Rev. 2.1 dissolved	Sulfate	99.9	102	102		0.0163	
EPA 350.1 Rev. 2.0	Ammonia-N	99.4	98.5	97.6			0.812
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	107	104			1.50
EPA 353.2 Rev. 2.0	NO2NO3-N	100	101	100			0.329
EPA 365.1 Rev. 2.0	Total-P	103	105	106			0.793
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	100	100			0.399
SM 2120 B-2011	Color (true)	98.6				18.0	
SM 2320 B-2011	Total Alkalinity	102				1.60	
SM 2540 C-2011	TDS					5.93	
SM 4500 F-C-2011	Fluoride	96.5	100	100			0.0
SM 5310 B-2011	Organic Carbon	99.6	105				0.540
	Organic Carbon	95.2	93.4	96.4			1.84

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2201327, 2201328, 2201329
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2201339, 2201340
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2201339, 2201340
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2201327, 2201328, 2201329
EPA 300.0 Rev. 2.1 dissolved	Sulfate, dissolved, in filtered, aqueous matrices	2201333, 2201334, 2201335
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2201330, 2201331, 2201332
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2201330, 2201331, 2201332
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2201330, 2201331, 2201332
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2201330, 2201331, 2201332
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2201333, 2201334, 2201335
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2201327, 2201328, 2201329
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2201327, 2201328, 2201329

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2201339, 2201340
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2201327, 2201328, 2201329
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2201327, 2201328, 2201329
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2201327, 2201328, 2201329
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2201330, 2201331, 2201332

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	10/13/2020			10/13/2020 15:29	Yen Ta	2201327, 2201328, 2201329
EPA 200.7 Rev. 4.4	10/13/2020	10/14/2020 16:20	Elliott D. Healy	10/15/2020 14:50	Betina Topolski	2201340
	10/13/2020	10/14/2020 16:20	Elliott D. Healy	10/15/2020 15:32	Betina Topolski	2201339
EPA 200.8 Rev. 5.4	10/13/2020	10/14/2020 16:20	Elliott D. Healy	10/23/2020 12:54	Alexander Thompson	2201340
	10/13/2020	10/14/2020 16:20	Elliott D. Healy	10/23/2020 14:25	Alexander Thompson	2201339
EPA 300.0 Rev. 2.1	10/13/2020			10/20/2020 20:15	Lipi Saha	2201327
	10/13/2020			10/26/2020 19:23	Lipi Saha	2201329
	10/13/2020			10/26/2020 20:28	Lipi Saha	2201328
EPA 300.0 Rev. 2.1 dissolved	10/13/2020			10/26/2020 23:45	Lipi Saha	2201333
	10/13/2020			10/26/2020 23:58	Lipi Saha	2201334
	10/13/2020			10/27/2020 00:11	Lipi Saha	2201335
EPA 350.1 Rev. 2.0	10/13/2020			10/17/2020 12:07	Ping Hua	2201330
	10/13/2020			10/17/2020 12:21	Ping Hua	2201332
	10/13/2020			10/17/2020 12:30	Ping Hua	2201331
EPA 351.2 Rev. 2.0	10/13/2020	10/15/2020 13:30	David Boose	10/20/2020 20:36	Julia Storbeck	2201330
	10/13/2020	10/15/2020 13:30	David Boose	10/20/2020 20:38	Julia Storbeck	2201331
	10/13/2020	10/15/2020 13:30	David Boose	10/20/2020 20:40	Julia Storbeck	2201332
EPA 353.2 Rev. 2.0	10/13/2020			10/15/2020 10:15	Beverly Y. Sanders	2201330
	10/13/2020			10/15/2020 10:16	Beverly Y. Sanders	2201331
	10/13/2020			10/15/2020 10:17	Beverly Y. Sanders	2201332
EPA 365.1 Rev. 2.0	10/13/2020	10/14/2020 12:45	Yen Ta	10/15/2020 16:13	Lipi Saha	2201332
	10/13/2020	10/14/2020 12:45	Yen Ta	10/19/2020 12:20	Shengyu Wang	2201330
	10/13/2020	10/14/2020 12:45	Yen Ta	10/19/2020 12:21	Shengyu Wang	2201331
EPA 365.1 Rev. 2.0 dissolved	10/13/2020			10/13/2020 15:46	Blanca Fach	2201333
	10/13/2020			10/13/2020 15:53	Blanca Fach	2201334
	10/13/2020			10/13/2020 15:54	Blanca Fach	2201335
SM 2120 B-2011	10/13/2020			10/13/2020 17:04	Madeline Gruver	2201327
	10/13/2020			10/13/2020 17:05	Madeline Gruver	2201328
	10/13/2020			10/13/2020 17:06	Madeline Gruver	2201329
SM 2320 B-2011	10/13/2020			10/19/2020 21:05	Samantha Davila	2201327
	10/13/2020			10/19/2020 21:32	Samantha Davila	2201328
	10/13/2020			10/19/2020 21:45	Samantha Davila	2201329
SM 2340B	10/13/2020			10/15/2020 14:50	Betina Topolski	2201340
	10/13/2020			10/15/2020 15:32	Betina Topolski	2201339
SM 2540 C-2011	10/13/2020			10/15/2020 15:25	Yijie Li	2201327, 2201328, 2201329
SM 2540 D-2011	10/13/2020			10/15/2020 15:25	Yijie Li	2201327, 2201328, 2201329
SM 4500 F-C-2011	10/13/2020			10/19/2020 20:55	Samantha Davila	2201327
	10/13/2020			10/19/2020 21:32	Samantha Davila	2201328
	10/13/2020			10/19/2020 21:45	Samantha Davila	2201329
SM 5310 B-2011	10/13/2020			10/15/2020 06:23	Madeline Gruver	2201330

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	10/13/2020			10/16/2020 23:57	Lauren Lees	2201331
	10/13/2020			10/17/2020 00:09	Lauren Lees	2201332