

Chemical Analysis Report

SW-DIST-2020-08-21-01

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

Event Description: **Lakes Scott and Gordon**

Request ID: **RQ-2020-08-17-20**

Customer: **SW-DIST**

Project ID: **SMP**

Send Reports to:

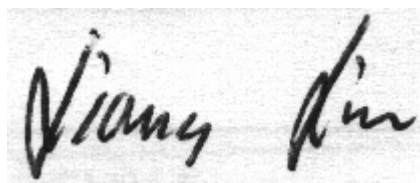
FL Dept. of Environmental Protection
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Attn: Matthew Bearden

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 10-SEP-2020 16:10

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 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: Scott Lake West

Collection Date/Time: 08/20/2020 09:25

Field ID: G2SW0134

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2191709	EPA 180.1 Rev. 2.0	Turbidity	18		NTU	P386411	
	EPA 300.0 Rev. 2.1	Chloride	27		mg Cl/L	P386940	
		Sulfate	9.1		mg SO4/L	P386942	
		Color (true)	7.5	A	PCU	P386420	
	SM 2320 B-2011	Total Alkalinity	52		mg CaCO3/L	P386492	
	SM 2540 C-2011	TDS	133		mg/L	P386800	
	SM 2540 D-2011	TSS	20		mg/L	P386795	
	SM 4500 F-C-2011	Fluoride	0.33		mg F/L	P386498	
2191710	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P386445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P386608	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P386542	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P386471	
	SM 5310 B-2011	Organic Carbon	8.7		mg C/L	P386549	
2191711	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386426	
2191717	EPA 200.7 Rev. 4.4	Barium	9.8		ug/L	P386472	
		Calcium	22.1		mg/L	P386472	
		Iron	32	I	ug/L	P386472	
		Magnesium	4.79		mg/L	P386472	
		Potassium	3.0		mg/L	P386472	
		Sodium	13.6		mg/L	P386472	
		Zinc	5.0	U	ug/L	P386472	
	EPA 200.8 Rev. 5.4	Aluminum	124		ug/L	P386472	
		Antimony	0.16	I	ug/L	P386472	
		Arsenic	4.51		ug/L	P386472	
		Boron**	35.9		ug/L	P386472	
		Cadmium	0.020	U	ug/L	P386472	
		Chromium	0.40	U	ug/L	P386472	
		Copper	1.63		ug/L	P386472	
		Lead	0.22	I	ug/L	P386472	
		Nickel	0.50	U	ug/L	P386472	
		Selenium	0.20	U	ug/L	P386472	
		Silver	0.010	U	ug/L	P386472	
		Thallium	0.10	U	ug/L	P386472	

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 Gordon Center

Collection Date/Time: 08/20/2020 11:00

Field ID: G3SW0095

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2191712	EPA 180.1 Rev. 2.0	Turbidity	0.55		NTU	P386412	
	EPA 300.0 Rev. 2.1	Chloride	9.9		mg Cl/L	P386940	
		Sulfate	5.3		mg SO4/L	P386942	
	SM 2120 B-2011	Color (true)	13	A	PCU	P386419	
	SM 2320 B-2011	Total Alkalinity	41		mg CaCO3/L	P386492	
	SM 2540 C-2011	TDS	80		mg/L	P386801	
	SM 2540 D-2011	TSS	2	I	mg/L	P386796	
	SM 4500 F-C-2011	Fluoride	0.080	I	mg F/L	P386498	
2191713	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P386445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P386608	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P386507	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P386471	
	SM 5310 B-2011	Organic Carbon	3.8		mg C/L	P386549	
2191714	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386426	

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: P386411

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386412

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386472

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: P386472

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: P386940

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386942

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: P386445

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386608

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386507

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386542

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386471

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386426

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

Reference Method: SM 2120 B-2011
Batch ID: P386419

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P386420

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P386492

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P386800

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P386801

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P386795

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P386796

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P386498

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P386549

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: P386472

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	103		P	85 - 115
Calcium	101		P	85 - 115
Iron	101		P	85 - 115
Magnesium	100		P	85 - 115
Potassium	101		P	85 - 115
Sodium	100		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386472

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.1		P	85 - 115
Antimony	92.1		P	85 - 115
Arsenic	103		P	85 - 115
Boron	105		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	108		P	85 - 115
Copper	98.1		P	85 - 115
Lead	110		P	85 - 115
Nickel	100		P	85 - 115
Selenium	97.4		P	85 - 115
Silver	109		P	85 - 115
Thallium	109		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386940

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386942

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386445

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386608

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386507

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386542

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: P386471

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: P386426

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

Reference Method: SM 2120 B-2011
Batch ID: P386419

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.8		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P386420

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.8		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P386492

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P386498

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P386549

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191623	Barium	105		P	80 - 120
2191623	Calcium	104		P	80 - 120
2191623	Iron	102		P	80 - 120
2191623	Magnesium	102		P	80 - 120
2191623	Potassium	99.0		P	80 - 120
2191623	Sodium	101		P	80 - 120
2191623	Zinc	105		P	80 - 120
2191701	Barium	106	107	P/P	80 - 120
2191701	Calcium	102		P	80 - 120
2191701	Iron	104	107	P/P	80 - 120
2191701	Magnesium	104		P	80 - 120
2191701	Potassium	103		P	80 - 120
2191701	Sodium	101		P	80 - 120
2191701	Zinc	106	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191623	Aluminum	99.1		P	80 - 120
2191623	Antimony	104		P	80 - 120
2191623	Arsenic	104		P	80 - 120
2191623	Boron	104		P	80 - 120
2191623	Cadmium	104		P	80 - 120
2191623	Chromium	111		P	80 - 120
2191623	Copper	99.2		P	80 - 120
2191623	Lead	111		P	80 - 120
2191623	Nickel	100		P	80 - 120
2191623	Selenium	91.8		P	80 - 120
2191623	Silver	109		P	80 - 120
2191623	Thallium	111		P	80 - 120
2191701	Aluminum	96.0	96.6	P/P	80 - 120
2191701	Antimony	102	97.4	P/P	80 - 120
2191701	Arsenic	103	105	P/P	80 - 120
2191701	Boron	103	103	P/P	80 - 120
2191701	Cadmium	102	103	P/P	80 - 120
2191701	Chromium	107	110	P/P	80 - 120
2191701	Copper	99.0	102	P/P	80 - 120
2191701	Lead	110	111	P/P	80 - 120
2191701	Nickel	99.2	101	P/P	80 - 120
2191701	Selenium	95.2	97.6	P/P	80 - 120
2191701	Silver	109	108	P/P	80 - 120
2191701	Thallium	110	113	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191693	Chloride	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386942

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191693	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191730	Ammonia-N	97.2	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191713	Kjeldahl Nitrogen	102	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386507

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191639	NO2NO3-N	93.8	94.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386542

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191898	NO2NO3-N	97.6	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386471

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191619	Total-P	104	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191695	O-Phosphate-P	98.1	96.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P386498

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191848	Fluoride	100	98.4	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P386549

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191508	Organic Carbon	97.1		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191637	Turbidity	1.21	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386412

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191752	Turbidity	7.53	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191701	Barium	0.667	Spike	P	0 - 20
2191701	Calcium	0.274	Spike	P	0 - 20
2191701	Iron	2.37	Spike	P	0 - 20
2191701	Magnesium	2.46	Spike	P	0 - 20
2191701	Potassium	0.113	Spike	P	0 - 20
2191701	Sodium	0.330	Spike	P	0 - 20
2191701	Zinc	1.42	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191701	Aluminum	0.648	Spike	P	0 - 20
2191701	Antimony	4.51	Spike	P	0 - 20
2191701	Arsenic	1.91	Spike	P	0 - 20
2191701	Boron	0.0982	Spike	P	0 - 20
2191701	Cadmium	0.759	Spike	P	0 - 20
2191701	Chromium	2.67	Spike	P	0 - 20
2191701	Copper	2.53	Spike	P	0 - 20
2191701	Lead	1.22	Spike	P	0 - 20
2191701	Nickel	1.40	Spike	P	0 - 20
2191701	Selenium	2.50	Spike	P	0 - 20
2191701	Silver	1.14	Spike	P	0 - 20
2191701	Thallium	2.33	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191693	Chloride	0.962	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191693	Sulfate	1.09	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191730	Ammonia-N	1.02	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191713	Kjeldahl Nitrogen	0.483	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191639	NO2NO3-N	0.506	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386542

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191898	NO2NO3-N	1.90	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386471

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191619	Total-P	1.33	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191695	O-Phosphate-P	1.54	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P386419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191712	Color (true)	2.40	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
 Batch ID: P386420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191709	Color (true)	5.80	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
 Batch ID: P386492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191848	Total Alkalinity	1.45	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
 Batch ID: P386800

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190978	TDS	2.17	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
 Batch ID: P386801

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191752	TDS	6.55	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
 Batch ID: P386498

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191848	Fluoride	1.42	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
 Batch ID: P386549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191508	Organic Carbon	0.455	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A100543

Included Lab Sample IDs: 2191709, 2191712

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A100591

Included Lab Sample IDs: 2191709, 2191712

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

Reference Method: SM 2120 B-2011

Run ID: A100594

Included Lab Sample IDs: 2191709, 2191712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115
Color (true)	98.5	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100595

Included Lab Sample IDs: 2191711, 2191714

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100600

Included Lab Sample IDs: 2191710, 2191713

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	98.9	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A100627

Included Lab Sample IDs: 2191709, 2191712

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.1	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A100627

Included Lab Sample IDs: 2191709, 2191712

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100631

Included Lab Sample IDs: 2191713

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100645

Included Lab Sample IDs: 2191710

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A100648

Included Lab Sample IDs: 2191717

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	103	P/P	90 - 110
Calcium	99.1	99.7	P/P	90 - 110
Iron	99.6	99.9	P/P	90 - 110
Magnesium	98.9	99.4	P/P	90 - 110
Potassium	98.4	98.9	P/P	90 - 110
Sodium	98.8	98.9	P/P	90 - 110
Zinc	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100649

Included Lab Sample IDs: 2191713

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	95.0	95.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100651

Included Lab Sample IDs: 2191710

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

Reference Method: SM 5310 B-2011

Run ID: A100654

Included Lab Sample IDs: 2191710, 2191713

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.1	94.2	P/P	90 - 110
Organic Carbon	96.5	95.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100700

Included Lab Sample IDs: 2191710, 2191713

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.2	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100715

Included Lab Sample IDs: 2191717

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.6	102	P/P	90 - 110
Arsenic	101	103	P/P	90 - 110
Boron	100	105	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	105	107	P/P	90 - 110
Copper	97.4	105	P/P	90 - 110
Lead	106	106	P/P	90 - 110
Nickel	98.2	105	P/P	90 - 110
Selenium	98.9	101	P/P	90 - 110
Silver	108	108	P/P	90 - 110
Thallium	104	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100716

Included Lab Sample IDs: 2191717

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	102	92.1	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					1.21	
	Turbidity					7.53	
EPA 200.7 Rev. 4.4	Barium	103	105	106	107		0.667
	Calcium	101	104	102			0.274
	Iron	101	102	104	107		2.37
	Magnesium	100	102	104			2.46
	Potassium	101	99.0	103			0.113
	Sodium	100	101	101			0.330
	Zinc	104	105	106	107		1.42
EPA 200.8 Rev. 5.4	Aluminum	98.1	96.0	96.6	99.1		0.648
	Antimony	92.1	102	97.4	104		4.51
	Arsenic	103	103	105	104		1.91
	Boron	105	103	103	104		0.0982
	Cadmium	102	102	103	104		0.759
	Chromium	108	107	110	111		2.67
	Copper	98.1	99.0	102	99.2		2.53
	Lead	110	110	111	111		1.22
	Nickel	100	99.2	101	100		1.40
	Selenium	97.4	95.2	97.6	91.8		2.50
	Silver	109	109	108	109		1.14
	Thallium	109	110	113	111		2.33
EPA 300.0 Rev. 2.1	Chloride	100	101			0.962	
	Sulfate	101	101			1.09	
EPA 350.1 Rev. 2.0	Ammonia-N	96.0	97.2	98.2			1.02
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	102	101			0.483
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	93.8	94.3			0.506
	NO ₂ NO ₃ -N	102	97.6	99.6			1.90
EPA 365.1 Rev. 2.0	Total-P	103	104	106			1.33
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	98.1	96.6			1.54
SM 2120 B-2011	Color (true)	97.8				2.40	
	Color (true)	97.8				5.80	
SM 2320 B-2011	Total Alkalinity	101				1.45	
SM 2540 C-2011	TDS					2.17	
	TDS					6.55	
SM 4500 F-C-2011	Fluoride	100	100	98.4			1.42
SM 5310 B-2011	Organic Carbon	99.2	97.1				0.455

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2191709, 2191712
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2191717
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2191717
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2191709, 2191712
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2191709, 2191712
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2191710, 2191713
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2191710, 2191713
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2191710, 2191713
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2191710, 2191713
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2191711, 2191714

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2191709, 2191712
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2191709, 2191712
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2191709, 2191712
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2191709, 2191712
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2191709, 2191712
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2191710, 2191713

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	08/21/2020			08/21/2020 14:31	Yen Ta	2191709, 2191712
EPA 200.7 Rev. 4.4	08/21/2020	08/24/2020 14:20	Elliott D. Healy	08/25/2020 20:14	Betina Topolski	2191717
EPA 200.8 Rev. 5.4	08/21/2020	08/24/2020 14:20	Elliott D. Healy	08/28/2020 23:10	Alexander Thompson	2191717
	08/21/2020	08/24/2020 14:20	Elliott D. Healy	08/29/2020 23:59	Alexander Thompson	2191717
EPA 300.0 Rev. 2.1	08/21/2020			08/21/2020 23:42	Julia Storbeck	2191709
	08/21/2020			08/21/2020 23:54	Julia Storbeck	2191712
EPA 350.1 Rev. 2.0	08/21/2020			08/23/2020 20:21	Ping Hua	2191710
	08/21/2020			08/23/2020 20:22	Ping Hua	2191713
EPA 351.2 Rev. 2.0	08/21/2020	08/27/2020 09:15	Sima Feizi	08/28/2020 09:41	Virginia P. Brown	2191713
	08/21/2020	08/27/2020 09:15	Sima Feizi	08/28/2020 09:48	Virginia P. Brown	2191710
EPA 353.2 Rev. 2.0	08/21/2020			08/25/2020 08:51	Beverly Y. Sanders	2191713
	08/21/2020			08/26/2020 09:35	Beverly Y. Sanders	2191710
EPA 365.1 Rev. 2.0	08/21/2020	08/24/2020 12:04	Yen Ta	08/25/2020 14:52	Benjamin T. Nordmann	2191710
	08/21/2020	08/24/2020 12:04	Yen Ta	08/26/2020 08:17	Lipi Saha	2191713
EPA 365.1 Rev. 2.0 dissolved	08/21/2020			08/21/2020 15:30	Virginia P. Brown	2191711
	08/21/2020			08/21/2020 15:31	Virginia P. Brown	2191714
SM 2120 B-2011	08/21/2020			08/21/2020 15:47	Benjamin T. Nordmann	2191712
	08/21/2020			08/21/2020 15:58	Benjamin T. Nordmann	2191709
SM 2320 B-2011	08/21/2020			08/24/2020 19:28	Dale L. Simmons	2191709
	08/21/2020			08/24/2020 19:40	Dale L. Simmons	2191712
SM 2540 C-2011	08/21/2020			08/24/2020 13:35	Yijie Li	2191709, 2191712
SM 2540 D-2011	08/21/2020			08/24/2020 13:35	Yijie Li	2191709, 2191712
SM 4500 F-C-2011	08/21/2020			08/24/2020 19:28	Dale L. Simmons	2191709
	08/21/2020			08/24/2020 19:40	Dale L. Simmons	2191712
SM 5310 B-2011	08/21/2020			08/26/2020 05:07	Lauren Lees	2191710
	08/21/2020			08/26/2020 05:46	Lauren Lees	2191713