

Chemical Analysis Report

NW-DIST-2021-02-18-02

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

Event Description: **Western Lakes**
Request ID: **RQ-2021-02-08-41**
Customer: **NW-DIST**
Project ID: **SMP**

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Date Certified: 11-MAR-2021 11:54



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 Stone Center

Collection Date/Time: 02/17/2021 11:05

Field ID: G4NW0426

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2225925	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P393982	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P394134	
		Sulfate	2.1		mg SO4/L	P394135	
	SM 2120 B-2011	Color (true)	20	A	PCU	P393979	
	SM 2320 B-2011	Total Alkalinity	4.7		mg CaCO3/L	P394363	
	SM 2540 C-2011	TDS	22	I	mg/L	P394349	
	SM 2540 D-2011	TSS	2	I	mg/L	P394341	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P394150	
2225926	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P394296	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.35		mg N/L	P394019	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P393994	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P394058	
	SM 5310 B-2011	Organic Carbon	5.6		mg C/L	P394587	
2225927	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P393970	
2225944	EPA 200.7 Rev. 4.4	Barium	8.1		ug/L	P393963	
		Calcium	2.49		mg/L	P393963	
		Iron	140		ug/L	P393963	
		Magnesium	1.05		mg/L	P393963	
		Manganese	6.8		ug/L	P393963	
		Potassium	0.34	I	mg/L	P393963	
		Sodium	1.8	I	mg/L	P393963	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P393963	
		Aluminum	57		ug/L	P393963	
		Antimony	0.050	U	ug/L	P393963	
		Arsenic	0.28		ug/L	P393963	
		Beryllium	0.028	I	ug/L	P393963	
		Boron**	14.4		ug/L	P393963	
		Cadmium	0.020	U	ug/L	P393963	
		Chromium	0.40	U	ug/L	P393963	
		Copper	0.40	U	ug/L	P393963	
		Lead	0.20	U	ug/L	P393963	
		Nickel	0.50	U	ug/L	P393963	
		Selenium	0.20	U	ug/L	P393963	
		Silver	0.010	U	ug/L	P393963	
		Thallium	0.10	U	ug/L	P393963	
		Hardness	10.5		mg/L	P393963	

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: FB_02172021

Collection Date/Time: 02/17/2021 11:15

Field ID: FB_02172021

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2225931	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P393983	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P394134	
		Sulfate	0.20	U	mg SO4/L	P394135	
		Color (true)	2.5	U	PCU	P393980	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P394363	
	SM 2540 C-2011	TDS	15	U	mg/L	P394347	
	SM 2540 D-2011	TSS	2	U	mg/L	P394339	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P394163	
2225932	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P394296	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P394019	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P393995	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P394058	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P394587	
2225933	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P393970	
2225945	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P393963	
		Calcium	0.075	U	mg/L	P393963	
		Iron	30	U	ug/L	P393963	
		Magnesium	0.040	U	mg/L	P393963	
		Manganese	1.0	U	ug/L	P393963	
		Potassium	0.30	U	mg/L	P393963	
		Sodium	0.50	U	mg/L	P393963	
		Zinc	5.0	U	ug/L	P393963	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P393963	
		Antimony	0.050	U	ug/L	P393963	
		Arsenic	0.050	U	ug/L	P393963	
		Beryllium	0.010	U	ug/L	P393963	
		Boron**	2.0	U	ug/L	P393963	
		Cadmium	0.020	U	ug/L	P393963	
		Chromium	0.40	U	ug/L	P393963	
		Copper	0.40	U	ug/L	P393963	
		Lead	0.20	U	ug/L	P393963	
		Nickel	0.50	U	ug/L	P393963	
		Selenium	0.20	U	ug/L	P393963	
		Silver	0.010	U	ug/L	P393963	
		Thallium	0.10	U	ug/L	P393963	
		Hardness	0.35	U	mg/L	P393963	

Ref. Method and Comment:

SM 2120 B-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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

Sample Location: Locklin Lake Center

Collection Date/Time: 02/17/2021 13:00

Field ID: G4NW0437

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2225928	EPA 180.1 Rev. 2.0	Turbidity	0.95		NTU	P393983	
	EPA 300.0 Rev. 2.1	Chloride	4.9		mg Cl/L	P394134	
		Sulfate	1.6		mg SO4/L	P394135	
	SM 2120 B-2011	Color (true)	6.1		PCU	P393979	
	SM 2320 B-2011	Total Alkalinity	7.7		mg CaCO3/L	P394363	
	SM 2540 C-2011	TDS	26		mg/L	P394349	
	SM 2540 D-2011	TSS	2	U	mg/L	P394341	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P394150	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P394296	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.17	I	mg N/L	P394019	
2225929	EPA 353.2 Rev. 2.0	NO2NO3-N	0.58		mg N/L	P393994	
	EPA 365.1 Rev. 2.0	Total-P	0.005	I	mg P/L	P394058	
	SM 5310 B-2011	Organic Carbon	1.2		mg C/L	P394587	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P393970	
	dissolved						
2225930	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P393970	

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: P393982

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P393983

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P393963

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
Manganese	1.0	U	ug/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: P393963

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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: P394134

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394135

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: P394296

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394019

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393994

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393995

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394058

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393970

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

Reference Method: SM 2120 B-2011
Batch ID: P393979

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P393980

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P394363

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: P394347

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P394349

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P394339

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P394341

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P394150

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-2011
Batch ID: P394163

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P394587

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: P393963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	107		P	85 - 115
Calcium	105		P	85 - 115
Iron	105		P	85 - 115
Magnesium	106		P	85 - 115
Manganese	102		P	85 - 115
Potassium	103		P	85 - 115
Sodium	107		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	80 - 120
Antimony	105		P	80 - 120
Arsenic	99.7		P	80 - 120
Beryllium	90.2		P	80 - 120
Boron	97.0		P	80 - 120
Cadmium	93.8		P	80 - 120
Chromium	97.0		P	80 - 120
Copper	97.1		P	80 - 120
Lead	101		P	80 - 120
Nickel	95.9		P	80 - 120
Selenium	101		P	80 - 120
Silver	100		P	85 - 115
Thallium	98.5		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394134

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394135

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394296

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394019

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393994

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393995

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: P394058

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393970

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

Reference Method: SM 2120 B-2011
Batch ID: P393979

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.4		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P393980

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

Reference Method: SM 2320 B-2011
Batch ID: P394363

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	94.8		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P394150

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	90 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P394163

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	90 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P394587

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P393963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225309	Barium	108		P	80 - 120
2225309	Calcium	106		P	80 - 120
2225309	Iron	103		P	80 - 120
2225309	Magnesium	107		P	80 - 120
2225309	Manganese	104		P	80 - 120
2225309	Potassium	104		P	80 - 120
2225309	Sodium	103		P	80 - 120
2225309	Zinc	105		P	80 - 120
2225624	Barium	108	108	P/P	80 - 120
2225624	Calcium	107		P	80 - 120
2225624	Iron	109	108	P/P	80 - 120
2225624	Magnesium	108	106	P/P	80 - 120
2225624	Manganese	104	104	P/P	80 - 120
2225624	Potassium	104	104	P/P	80 - 120
2225624	Sodium	106	105	P/P	80 - 120
2225624	Zinc	106	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P393963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225309	Aluminum	100		P	80 - 120
2225309	Antimony	105		P	80 - 120
2225309	Arsenic	97.1		P	80 - 120
2225309	Beryllium	88.5		P	80 - 120
2225309	Boron	105		P	80 - 120
2225309	Cadmium	95.9		P	80 - 120
2225309	Chromium	97.8		P	80 - 120
2225309	Copper	96.5		P	80 - 120
2225309	Lead	103		P	80 - 120
2225309	Nickel	93.9		P	80 - 120
2225309	Selenium	92.0		P	80 - 120
2225309	Silver	97.9		P	80 - 120
2225309	Thallium	100		P	80 - 120
2225624	Aluminum	103	100	P/P	80 - 120
2225624	Antimony	107	106	P/P	80 - 120
2225624	Arsenic	96.9	96.8	P/P	80 - 120
2225624	Beryllium	92.4	91.9	P/P	80 - 120
2225624	Boron	103	99.8	P/P	80 - 120
2225624	Cadmium	97.0	96.8	P/P	80 - 120
2225624	Chromium	98.5	97.9	P/P	80 - 120
2225624	Copper	94.4	93.3	P/P	80 - 120
2225624	Lead	102	101	P/P	80 - 120
2225624	Nickel	94.3	93.4	P/P	80 - 120
2225624	Selenium	98.4	97.7	P/P	80 - 120
2225624	Silver	102	103	P/P	80 - 120
2225624	Thallium	100	100	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P394134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225832	Chloride	99.2		P	90 - 110
2226014	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225832	Sulfate	95.5		P	90 - 110
2226014	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225929	Ammonia-N	99.2	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394019

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225840	Kjeldahl Nitrogen	103	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393994

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225896	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393995

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226006	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394058

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225873	Total-P	108	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225927	O-Phosphate-P	97.9	96.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P394150

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225834	Fluoride	98.3	98.8	P/P	94 - 107

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P394163

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2226073	Fluoride	101	100	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P394587

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2225926	Organic Carbon	95.0	96.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P393982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225835	Turbidity	3.66	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P393983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225810	Turbidity	4.62	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P393963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225624	Barium	0.327	Spike	P	0 - 20
2225624	Calcium	1.19	Spike	P	0 - 20
2225624	Iron	1.49	Spike	P	0 - 20
2225624	Magnesium	1.16	Spike	P	0 - 20
2225624	Manganese	0.273	Spike	P	0 - 20
2225624	Potassium	0.186	Spike	P	0 - 20
2225624	Sodium	0.643	Spike	P	0 - 20
2225624	Zinc	0.829	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225624	Aluminum	2.47	Spike	P	0 - 20
2225624	Antimony	0.902	Spike	P	0 - 20
2225624	Arsenic	0.152	Spike	P	0 - 20
2225624	Beryllium	0.567	Spike	P	0 - 20
2225624	Boron	2.48	Spike	P	0 - 20
2225624	Cadmium	0.189	Spike	P	0 - 20
2225624	Chromium	0.697	Spike	P	0 - 20
2225624	Copper	1.25	Spike	P	0 - 20
2225624	Lead	0.771	Spike	P	0 - 20
2225624	Nickel	0.936	Spike	P	0 - 20
2225624	Selenium	0.794	Spike	P	0 - 20
2225624	Silver	0.567	Spike	P	0 - 20
2225624	Thallium	0.202	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225832	Chloride	0.408	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225832	Sulfate	0.352	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225929	Ammonia-N	0.357	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394019

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225840	Kjeldahl Nitrogen	3.09	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225896	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393995

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226006	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225873	Total-P	1.97	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225927	O-Phosphate-P	1.54	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P393979

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225925	Color (true)	0.877	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
 Batch ID: P394363

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225834	Total Alkalinity	0.115	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
 Batch ID: P394347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225576	TDS	4.04	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
 Batch ID: P394349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225836	TDS	8.74	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
 Batch ID: P394150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225834	Fluoride	0.472	Spike	P	0 - 2.8

Reference Method: SM 4500 F-C-2011
 Batch ID: P394163

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2226073	Fluoride	0.472	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
 Batch ID: P394587

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2225926	Organic Carbon	0.810	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A103659

Included Lab Sample IDs: 2225927, 2225930, 2225933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	98.4	P/P	90 - 110
O-Phosphate-P	98.4	97.9	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A103663

Included Lab Sample IDs: 2225925, 2225928, 2225931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 115
Color (true)	99.5	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A103665

Included Lab Sample IDs: 2225925, 2225928, 2225931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105
Turbidity	102	102	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103685

Included Lab Sample IDs: 2225926, 2225929, 2225932

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A103709

Included Lab Sample IDs: 2225926, 2225929, 2225932

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	105	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A103713

Included Lab Sample IDs: 2225944, 2225945

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	105	105	P/P	90 - 110
Barium	109	105	P/P	90 - 110
Calcium	104	104	P/P	90 - 110
Calcium	105	105	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Iron	104	104	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Magnesium	104	104	P/P	90 - 110
Manganese	105	99.8	P/P	90 - 110
Manganese	99.9	100	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Potassium	99.3	99.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A103713

Included Lab Sample IDs: 2225944, 2225945

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	101	102	P/P	90 - 110
Sodium	103	102	P/P	90 - 110
Zinc	104	104	P/P	90 - 110
Zinc	105	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103721

Included Lab Sample IDs: 2225926, 2225929, 2225932

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	99.2	P/P	90 - 110
Total-P	99.5	98.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A103737

Included Lab Sample IDs: 2225925, 2225928, 2225931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	100	P/P	90 - 110
Sulfate	99.3	99.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A103741

Included Lab Sample IDs: 2225925, 2225928

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

Reference Method: SM 4500 F-C-2011

Run ID: A103744

Included Lab Sample IDs: 2225931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	96.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A103757

Included Lab Sample IDs: 2225944, 2225945

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	101	P/P	90 - 110
Aluminum	104	100	P/P	90 - 110
Antimony	102	103	P/P	90 - 110
Antimony	103	102	P/P	90 - 110
Arsenic	101	99.6	P/P	90 - 110
Arsenic	98.6	99.2	P/P	90 - 110
Beryllium	95.5	95.8	P/P	90 - 110
Beryllium	97.9	98.5	P/P	90 - 110
Boron	106	102	P/P	90 - 110
Boron	95.7	100	P/P	90 - 110
Cadmium	101	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A103757

Included Lab Sample IDs: 2225944, 2225945

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	99.0	98.7	P/P	90 - 110
Chromium	100	100	P/P	90 - 110
Chromium	99.6	100	P/P	90 - 110
Copper	98.0	99.3	P/P	90 - 110
Copper	98.2	98.3	P/P	90 - 110
Lead	103	105	P/P	90 - 110
Lead	104	104	P/P	90 - 110
Nickel	98.7	99.8	P/P	90 - 110
Nickel	99.2	98.9	P/P	90 - 110
Selenium	100	102	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Thallium	104	104	P/P	90 - 110
Thallium	107	107	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A103808

Included Lab Sample IDs: 2225926, 2225929, 2225932

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	100	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A103841

Included Lab Sample IDs: 2225925, 2225928, 2225931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	94.1	92.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A103868

Included Lab Sample IDs: 2225944, 2225945

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

Reference Method: SM 5310 B-2011

Run ID: A103922

Included Lab Sample IDs: 2225926, 2225929, 2225932

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	96.4	P/P	90 - 110
Organic Carbon	96.4	97.0	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					3.66	
	Turbidity					4.62	
EPA 200.7 Rev. 4.4	Barium	107	108	108	108		0.327
	Calcium	105	106	107			1.19
	Iron	105	103	109	108		1.49
	Magnesium	106	107	108	106		1.16
	Manganese	102	104	104	104		0.273
	Potassium	103	104	104	104		0.186
	Sodium	107	103	106	105		0.643
	Zinc	103	105	106	105		0.829
EPA 200.8 Rev. 5.4	Aluminum	100	103	100	100		2.47
	Antimony	105	107	106	105		0.902
	Arsenic	99.7	96.9	96.8	97.1		0.152
	Beryllium	90.2	92.4	91.9	88.5		0.567
	Boron	97.0	103	99.8	105		2.48
	Cadmium	93.8	97.0	96.8	95.9		0.189
	Chromium	97.0	98.5	97.9	97.8		0.697
	Copper	97.1	94.4	93.3	96.5		1.25
	Lead	101	102	101	103		0.771
	Nickel	95.9	94.3	93.4	93.9		0.936
	Selenium	101	98.4	97.7	92.0		0.794
	Silver	100	102	103	97.9		0.567
	Thallium	98.5	100	100	100		0.202
EPA 300.0 Rev. 2.1	Chloride	102	99.2	100		0.408	
	Sulfate	101	95.5	101		0.352	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.2	99.6			0.357
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	103	106			3.09
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	104	104			0.0
	NO ₂ NO ₃ -N	102	104	104			0.482
EPA 365.1 Rev. 2.0	Total-P	105	108	105			1.97
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	97.9	96.4			1.54
SM 2120 B-2011	Color (true)	99.4				0.877	
	Color (true)	99.6					
SM 2320 B-2011	Total Alkalinity	94.8				0.115	
SM 2540 C-2011	TDS					4.04	
	TDS					8.74	
SM 4500 F-C-2011	Fluoride	97.9	98.3	98.8			0.472
	Fluoride	99.3	101	100			0.472
SM 5310 B-2011	Organic Carbon	95.4	95.0	96.0			0.810

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2225925, 2225928, 2225931
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2225944, 2225945
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2225944, 2225945
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2225925, 2225928, 2225931
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2225925, 2225928, 2225931
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2225926, 2225929, 2225932
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2225926, 2225929, 2225932
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2225926, 2225929, 2225932

Reference Method Descriptions

Method	Description	Associated Samples
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2225926, 2225929, 2225932
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2225927, 2225930, 2225933
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2225925, 2225928, 2225931
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2225925, 2225928, 2225931
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2225944, 2225945
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2225925, 2225928, 2225931
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2225925, 2225928, 2225931
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2225925, 2225928, 2225931
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2225926, 2225929, 2225932

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	02/18/2021			02/18/2021 16:18	Yen Ta	2225925, 2225928, 2225931
EPA 200.7 Rev. 4.4	02/18/2021	02/18/2021 16:00	Elliott D. Healy	02/22/2021 15:08	Betina Topolski	2225945
	02/18/2021	02/18/2021 16:00	Elliott D. Healy	02/22/2021 18:39	Betina Topolski	2225944
EPA 200.8 Rev. 5.4	02/18/2021	02/18/2021 16:00	Elliott D. Healy	02/24/2021 12:51	Alexander Thompson	2225945
	02/18/2021	02/18/2021 16:00	Elliott D. Healy	02/24/2021 15:27	Alexander Thompson	2225944
	02/18/2021	02/18/2021 16:00	Elliott D. Healy	03/03/2021 11:18	Alexander Thompson	2225945
	02/18/2021	02/18/2021 16:00	Elliott D. Healy	03/03/2021 12:56	Alexander Thompson	2225944
EPA 300.0 Rev. 2.1	02/18/2021			02/22/2021 22:44	Lipi Saha	2225925
	02/18/2021			02/22/2021 22:56	Lipi Saha	2225928
	02/18/2021			02/22/2021 23:08	Lipi Saha	2225931
EPA 350.1 Rev. 2.0	02/18/2021			02/27/2021 10:12	Ping Hua	2225929
	02/18/2021			02/27/2021 10:17	Ping Hua	2225926
	02/18/2021			02/27/2021 10:26	Ping Hua	2225932
EPA 351.2 Rev. 2.0	02/18/2021	02/19/2021 12:31	Yen Ta	02/22/2021 12:59	Virginia P. Brown	2225926
	02/18/2021	02/19/2021 12:31	Yen Ta	02/22/2021 13:01	Virginia P. Brown	2225929
	02/18/2021	02/19/2021 12:31	Yen Ta	02/22/2021 13:03	Virginia P. Brown	2225932
EPA 353.2 Rev. 2.0	02/18/2021			02/19/2021 10:21	Beverly Y. Sanders	2225926
	02/18/2021			02/19/2021 10:22	Beverly Y. Sanders	2225929
	02/18/2021			02/19/2021 10:41	Beverly Y. Sanders	2225932
EPA 365.1 Rev. 2.0	02/18/2021	02/22/2021 12:30	Yen Ta	02/23/2021 12:46	Shengyu Wang	2225926
	02/18/2021	02/22/2021 12:30	Yen Ta	02/23/2021 12:53	Shengyu Wang	2225929
	02/18/2021	02/22/2021 12:30	Yen Ta	02/23/2021 12:54	Shengyu Wang	2225932
EPA 365.1 Rev. 2.0 dissolved	02/18/2021			02/18/2021 15:38	Virginia P. Brown	2225927
	02/18/2021			02/18/2021 15:41	Virginia P. Brown	2225930
	02/18/2021			02/18/2021 15:46	Virginia P. Brown	2225933
SM 2120 B-2011	02/18/2021			02/18/2021 16:03	Benjamin T. Nordmann	2225925
	02/18/2021			02/18/2021 16:04	Benjamin T. Nordmann	2225928
	02/18/2021			02/18/2021 16:07	Benjamin T. Nordmann	2225931
SM 2320 B-2011	02/18/2021			02/27/2021 03:30	Dale L. Simmons	2225925
	02/18/2021			02/27/2021 03:37	Dale L. Simmons	2225928
	02/18/2021			02/27/2021 03:43	Dale L. Simmons	2225931
SM 2340B	02/18/2021			02/22/2021 15:08	Betina Topolski	2225945
	02/18/2021			02/22/2021 18:39	Betina Topolski	2225944
SM 2540 C-2011	02/18/2021			02/22/2021 14:12	Yijie Li	2225925, 2225928, 2225931
SM 2540 D-2011	02/18/2021			02/22/2021 14:12	Yijie Li	2225925, 2225928, 2225931
SM 4500 F-C-2011	02/18/2021			02/20/2021 02:28	Dale L. Simmons	2225925
	02/18/2021			02/20/2021 02:39	Dale L. Simmons	2225928
	02/18/2021			02/23/2021 20:06	Dale L. Simmons	2225931
SM 5310 B-2011	02/18/2021			03/05/2021 07:21	Madeline Gruver	2225926
	02/18/2021			03/05/2021 10:44	Madeline Gruver	2225929

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	02/18/2021			03/05/2021 10:57	Madeline Gruver	2225932