

Chemical Analysis Report

CEN-DIST-2021-07-15-07

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

Event Description: **Lake Lotta**
Request ID: **RQ-2021-07-05-06**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 11-AUG-2021 15:50

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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 Lotta at Center of Southern Lobe

Collection Date/Time: 07/14/2021 10:50

Field ID: G2CE0093

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2262449	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P401043	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P401361	
		Sulfate	19		mg SO4/L	P401364	
		Color (true)	69		PCU	P401040	
	SM 2320 B-2011	Total Alkalinity	50		mg CaCO3/L	P401144	
	SM 2540 C-2011	TDS	131		mg/L	P401421	
	SM 2540 D-2011	TSS	5	I	mg/L	P401227	
	SM 4500 F-C-2011	Fluoride	0.13		mg F/L	P401147	
2262450	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P401594	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P401998	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P401151	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P401397	
	SM 5310 B-2011	Organic Carbon	13		mg C/L	P401489	
2262451	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P401032	
2262453	EPA 200.7 Rev. 4.4	Barium	15.3		ug/L	P401018	
		Calcium	25.2		mg/L	P401018	
		Iron	53	I	ug/L	P401018	
		Magnesium	3.95		mg/L	P401018	
		Manganese	24.7		ug/L	P401018	
		Potassium	2.9		mg/L	P401018	
		Sodium	8.6		mg/L	P401018	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P401018	
		Aluminum	15	I	ug/L	P401411	
		Antimony	0.23		ug/L	P401411	
		Arsenic	0.74		ug/L	P401411	
		Beryllium	0.010	U	ug/L	P401411	
		Boron**	33.5		ug/L	P401411	
		Cadmium	0.020	U	ug/L	P401411	
		Chromium	0.40	U	ug/L	P401411	
		Copper	0.40	U	ug/L	P401411	
		Lead	0.20	U	ug/L	P401411	
		Nickel	0.50	U	ug/L	P401411	
		Selenium	0.20	U	ug/L	P401411	
		Silver	0.010	U	ug/L	P401634	
		Thallium	0.10	U	ug/L	P401411	
	SM 2340B	Hardness	79.2		mg/L	P401562	

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: P401043

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P401018

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: P401411

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
Thallium	0.10	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401634

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401361

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401364

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: P401594

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401998

Component	Result	Code	Units
Kjeldahl Nitrogen	0.11	I	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401151

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401397

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401032

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

Reference Method: SM 2120 B-2011
Batch ID: P401040

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P401144

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

Reference Method: SM 2540 C-2011
Batch ID: P401421

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P401227

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P401489

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: P401018

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	107		P	85 - 115
Iron	106		P	85 - 115
Magnesium	109		P	85 - 115
Manganese	102		P	85 - 115
Potassium	101		P	85 - 115
Sodium	106		P	85 - 115
Zinc	99.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401411

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	105		P	85 - 115
Antimony	108		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	106		P	85 - 115
Boron	105		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	101		P	85 - 115
Copper	99.0		P	85 - 115
Lead	102		P	85 - 115
Nickel	102		P	85 - 115
Selenium	102		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401634

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Silver	113		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P401361

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P401364

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: P401594

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401998

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401151

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: P401397

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: P401032

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

Reference Method: SM 2120 B-2011
Batch ID: P401040

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P401144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.5		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P401489

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P401018

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262059	Barium	106		P	80 - 120
2262059	Calcium	114		P	80 - 120
2262059	Iron	111		P	80 - 120
2262059	Magnesium	115		P	80 - 120
2262059	Manganese	105		P	80 - 120
2262059	Potassium	103		P	80 - 120
2262059	Sodium	108		P	80 - 120
2262059	Zinc	108		P	80 - 120
2262373	Barium	104	108	P/P	80 - 120
2262373	Calcium	109		P	80 - 120
2262373	Iron	108	112	P/P	80 - 120
2262373	Magnesium	107	114	P/P	80 - 120
2262373	Manganese	103	107	P/P	80 - 120
2262373	Potassium	98.9	104	P/P	80 - 120
2262373	Sodium	104		P	80 - 120
2262373	Zinc	107	111	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401411

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262058	Aluminum	106		P	80 - 120
2262058	Antimony	113		P	80 - 120
2262058	Arsenic	98.8		P	80 - 120
2262058	Beryllium	107		P	80 - 120
2262058	Boron	109		P	80 - 120
2262058	Cadmium	104		P	80 - 120
2262058	Chromium	102		P	80 - 120
2262058	Copper	95.6		P	80 - 120
2262058	Lead	103		P	80 - 120
2262058	Nickel	96.2		P	80 - 120
2262058	Selenium	101		P	80 - 120
2262058	Thallium	104		P	80 - 120
2262294	Aluminum	102	103	P/P	80 - 120
2262294	Antimony	107	108	P/P	80 - 120
2262294	Arsenic	100	99.4	P/P	80 - 120
2262294	Beryllium	104	106	P/P	80 - 120
2262294	Boron	104	107	P/P	80 - 120
2262294	Cadmium	102	103	P/P	80 - 120
2262294	Chromium	100	101	P/P	80 - 120
2262294	Copper	97.1	94.4	P/P	80 - 120
2262294	Lead	98.0	98.0	P/P	80 - 120
2262294	Nickel	93.0	91.5	P/P	80 - 120
2262294	Selenium	99.5	99.6	P/P	80 - 120
2262294	Thallium	105	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401634

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262058	Silver	111	107	P/P	80 - 120
2262400	Silver	111		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401361

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262274	Chloride	98.8		P	90 - 110
2262350	Chloride	98.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401364

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262274	Sulfate	98.9		P	90 - 110
2262350	Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262354	Ammonia-N	99.0	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401998

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262091	Kjeldahl Nitrogen	107	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401151

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262417	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401397

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262351	Total-P	102	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262430	O-Phosphate-P	96.1	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262394	Fluoride	101	100	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P401489

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262587	Organic Carbon	95.4	97.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P401043

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262350	Turbidity	3.67	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P401018

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262373	Barium	3.67	Spike	P	0 - 20
2262373	Calcium	3.46	Spike	P	0 - 20
2262373	Iron	3.43	Spike	P	0 - 20
2262373	Magnesium	3.82	Spike	P	0 - 20
2262373	Manganese	3.43	Spike	P	0 - 20
2262373	Potassium	2.71	Spike	P	0 - 20
2262373	Sodium	2.39	Spike	P	0 - 20
2262373	Zinc	3.49	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401411

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262294	Aluminum	1.13	Spike	P	0 - 20
2262294	Antimony	0.763	Spike	P	0 - 20
2262294	Arsenic	1.00	Spike	P	0 - 20
2262294	Beryllium	1.60	Spike	P	0 - 20
2262294	Boron	2.01	Spike	P	0 - 20
2262294	Cadmium	1.16	Spike	P	0 - 20
2262294	Chromium	0.783	Spike	P	0 - 20
2262294	Copper	2.68	Spike	P	0 - 20
2262294	Lead	0.00119	Spike	P	0 - 20
2262294	Nickel	1.45	Spike	P	0 - 20
2262294	Selenium	0.119	Spike	P	0 - 20
2262294	Thallium	0.280	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P401634

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262058	Silver	4.16	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P401361

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262350	Chloride	0.304	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401364

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262350	Sulfate	0.407	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262354	Ammonia-N	2.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401998

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262091	Kjeldahl Nitrogen	2.42	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401151

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262417	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262351	Total-P	2.68	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262430	O-Phosphate-P	1.86	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P401040

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262394	Color (true)	5.16	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P401144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262394	Total Alkalinity	0.291	Sample	P	0 - 5.2

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P401421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262036	TDS	6.57	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262394	Fluoride	0.457	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P401489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262587	Organic Carbon	1.42	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: A106644

Included Lab Sample IDs: 2262451

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.7	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A106646

Included Lab Sample IDs: 2262449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	101	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A106647

Included Lab Sample IDs: 2262449

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

Reference Method: SM 2320 B-2011

Run ID: A106679

Included Lab Sample IDs: 2262449

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

Reference Method: SM 4500 F-C-2011

Run ID: A106679

Included Lab Sample IDs: 2262449

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A106682

Included Lab Sample IDs: 2262450

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A106762

Included Lab Sample IDs: 2262449

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A106786

Included Lab Sample IDs: 2262450

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A106803

Included Lab Sample IDs: 2262450

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.1	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A106806

Included Lab Sample IDs: 2262453

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	102	P/P	90 - 110
Arsenic	98.7	98.7	P/P	90 - 110
Beryllium	100	100	P/P	90 - 110
Boron	101	103	P/P	90 - 110
Cadmium	104	103	P/P	90 - 110
Chromium	102	99.7	P/P	90 - 110
Copper	94.8	93.9	P/P	90 - 110
Lead	99.9	99.6	P/P	90 - 110
Nickel	94.8	94.4	P/P	90 - 110
Selenium	102	102	P/P	90 - 110
Thallium	98.4	97.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A106829

Included Lab Sample IDs: 2262453

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	108	109	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A106839

Included Lab Sample IDs: 2262453

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	99.6	P/P	90 - 110
Calcium	103	103	P/P	90 - 110
Iron	100	100	P/P	90 - 110
Magnesium	100	100	P/P	90 - 110
Manganese	102	100	P/P	90 - 110
Potassium	98.9	99.2	P/P	90 - 110
Sodium	99.6	99.9	P/P	90 - 110
Zinc	105	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A106850

Included Lab Sample IDs: 2262450

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A106941

Included Lab Sample IDs: 2262453

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	99.3	95.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107072

Included Lab Sample IDs: 2262450

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	101	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					3.67	
EPA 200.7 Rev. 4.4	Barium	102	106	104	108		3.67
	Calcium	107	114	109			3.46
	Iron	106	111	108	112		3.43
	Magnesium	109	115	107	114		3.82
	Manganese	102	105	103	107		3.43
	Potassium	101	103	98.9	104		2.71
	Sodium	106	108	104			2.39
	Zinc	99.6	108	107	111		3.49
EPA 200.8 Rev. 5.4	Aluminum	105	102	103	106		1.13
	Antimony	108	107	108	113		0.763
	Arsenic	102	98.8	100	99.4		1.00
	Beryllium	106	104	106	107		1.60
	Boron	105	104	107	109		2.01
	Cadmium	101	102	103	104		1.16
	Chromium	101	100	101	102		0.783
	Copper	99.0	97.1	94.4	95.6		2.68
	Lead	102	98.0	98.0	103		0.0011
	Nickel	102	93.0	91.5	96.2		1.45
	Selenium	102	99.5	99.6	101		0.119
	Silver	113	111	107	111		4.16
	Thallium	103	105	105	104		0.280
EPA 300.0 Rev. 2.1	Chloride	100	98.1	98.8		0.304	
	Sulfate	99.9	98.9	98.9		0.407	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.0	96.0			2.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	107	103			2.42
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	101	101			0.0
EPA 365.1 Rev. 2.0	Total-P	105	102	106			2.68
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	96.1	98.0			1.86
SM 2120 B-2011	Color (true)	101				5.16	
SM 2320 B-2011	Total Alkalinity	101				0.291	
SM 2540 C-2011	TDS					6.57	
SM 4500 F-C-2011	Fluoride	99.5	101	100			0.457
SM 5310 B-2011	Organic Carbon	95.8	95.4	97.4			1.42

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2262449
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2262453
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2262453
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2262449
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2262449
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2262450
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2262450
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2262450
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2262450
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2262451
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2262449
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2262449

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2262453
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2262449
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2262449
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2262449
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2262450

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	07/15/2021			07/15/2021 15:38	Sarah A Nixon	2262449
EPA 200.7 Rev. 4.4	07/15/2021	07/15/2021 14:55	Elliott D. Healy	07/26/2021 17:05	Josef B Mick	2262453
EPA 200.8 Rev. 5.4	07/15/2021	07/22/2021 15:25	Elliott D. Healy	07/23/2021 21:41	Alexander Thompson	2262453
	07/15/2021	07/22/2021 15:25	Elliott D. Healy	07/26/2021 16:02	Alexander Thompson	2262453
	07/15/2021	07/28/2021 12:45	Elliott D. Healy	07/29/2021 20:15	McKinley C Carter	2262453
EPA 300.0 Rev. 2.1	07/15/2021			07/21/2021 05:30	Lipi Saha	2262449
EPA 350.1 Rev. 2.0	07/15/2021			07/27/2021 12:24	Roberta Tatti	2262450
EPA 351.2 Rev. 2.0	07/15/2021	08/04/2021 14:07	Benjamin T. Nordmann	08/05/2021 14:46	Virginia P. Brown	2262450
EPA 353.2 Rev. 2.0	07/15/2021			07/19/2021 10:18	Beverly Y. Sanders	2262450
EPA 365.1 Rev. 2.0	07/15/2021	07/22/2021 12:02	Shengyu Ding	07/23/2021 08:58	Shengyu Ding	2262450
EPA 365.1 Rev. 2.0 dissolved	07/15/2021			07/15/2021 15:43	Ping Hua	2262451
SM 2120 B-2011	07/15/2021			07/15/2021 16:32	Sarah A Nixon	2262449
SM 2320 B-2011	07/15/2021			07/17/2021 06:32	Dale L. Simmons	2262449
SM 2340B	07/15/2021			07/26/2021 17:05	Josef B Mick	2262453
SM 2540 C-2011	07/15/2021			07/16/2021 14:42	Yijie Li	2262449
SM 2540 D-2011	07/15/2021			07/16/2021 14:42	Yijie Li	2262449
SM 4500 F-C-2011	07/15/2021			07/17/2021 06:32	Dale L. Simmons	2262449
SM 5310 B-2011	07/15/2021			07/22/2021 14:27	Madeline Gruver	2262450