

Chemical Analysis Report

TLH-ROC-2020-10-20-01

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

Event Description: **Run 10**
Request ID: **RQ-2020-10-12-45**
Customer: **TLH-ROC**
Project ID: **SMP**

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Date Certified: 12-NOV-2020 15:31



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: Double Bayou 800m Upstream From Lake Wimico

Collection Date/Time: 10/19/2020 13:00

Field ID: G2TLHR0003

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2203363	EPA 180.1 Rev. 2.0	Turbidity	6.0	A	NTU	P388976	
	EPA 300.0 Rev. 2.1	Chloride	36	A	mg Cl/L	P389373	
		Sulfate	5.4	A	mg SO4/L	P389376	
	SM 2120 B-2011	Color (true)	110		PCU	P388984	
	SM 2320 B-2011	Total Alkalinity	42		mg CaCO3/L	P389229	
	SM 2540 C-2011	TDS	125		mg/L	P389381	
	SM 2540 D-2011	TSS	3	I	mg/L	P389309	
	SM 4500 F-C-2011	Fluoride	0.057	I	mg F/L	P389118	
2203364	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P389201	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P389097	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P389154	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P389175	
	SM 5310 B-2011	Organic Carbon	8.8		mg C/L	P389068	
2203365	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P388987	

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: Inter-coastal 450m D-Stream Pine Log Boat Ramp

Collection Date/Time: 10/19/2020 15:00

Field ID: G2TLHR0034

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2203366	EPA 180.1 Rev. 2.0	Turbidity	13		NTU	P388976	
	EPA 300.0 Rev. 2.1	Chloride	6.0		mg Cl/L	P389373	
		Sulfate	5.4		mg SO4/L	P389376	
	SM 2120 B-2011	Color (true)	67		PCU	P388984	
	SM 2320 B-2011	Total Alkalinity	39		mg CaCO3/L	P389229	
	SM 2540 C-2011	TDS	73		mg/L	P389381	
	SM 2540 D-2011	TSS	6	I	mg/L	P389309	
	SM 4500 F-C-2011	Fluoride	0.066	I	mg F/L	P389118	
2203368	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P389201	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.34		mg N/L	P389097	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.41		mg N/L	P389154	
	EPA 365.1 Rev. 2.0	Total-P	0.035		mg P/L	P389175	
	SM 5310 B-2011	Organic Carbon	4.2		mg C/L	P389068	
2203370	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P388987	
2203378	EPA 200.7 Rev. 4.4	Barium	22.9		ug/L	P389029	
		Calcium	14.5		mg/L	P389029	
		Iron	1.10E+03		ug/L	P389029	
		Magnesium	1.96		mg/L	P389029	
		Potassium	2.0		mg/L	P389029	
		Sodium	6.3		mg/L	P389029	
		Zinc	5.0	U	ug/L	P389029	
	EPA 200.8 Rev. 5.4	Aluminum	407		ug/L	P389029	
		Antimony	0.066	I	ug/L	P389029	
		Arsenic	0.57		ug/L	P389029	
		Beryllium	0.039	I	ug/L	P389029	
		Boron**	18.6		ug/L	P389029	
		Cadmium	0.020	U	ug/L	P389029	
		Chromium	0.77	I	ug/L	P389029	
		Copper	0.77	I	ug/L	P389029	
		Lead	0.35	I	ug/L	P389029	
		Nickel	0.51	I	ug/L	P389029	
		Selenium	0.20	U	ug/L	P389029	
		Silver	0.010	U	ug/L	P389029	
		Thallium	0.10	U	ug/L	P389029	
	SM 2340B	Hardness	44.4		mg/L	P389029	

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: Apalachicola River .8 Miles Upstream Owl Creek

Collection Date/Time: 10/19/2020 11:00

Field ID: G2TLHR0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2203367	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P388976	
	EPA 300.0 Rev. 2.1	Chloride	4.8		mg Cl/L	P389373	
		Sulfate	5.1		mg SO4/L	P389376	
	SM 2120 B-2011	Color (true)	49		PCU	P388984	
	SM 2320 B-2011	Total Alkalinity	42		mg CaCO3/L	P389229	
	SM 2540 C-2011	TDS	78		mg/L	P389382	
	SM 2540 D-2011	TSS	12		mg/L	P389310	
	SM 4500 F-C-2011	Fluoride	0.064	I	mg F/L	P389118	
2203369	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P389201	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33		mg N/L	P389187	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.57		mg N/L	P389154	
	EPA 365.1 Rev. 2.0	Total-P	0.035		mg P/L	P389175	
	SM 5310 B-2011	Organic Carbon	3.6		mg C/L	P389068	
2203371	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P388987	
2203379	EPA 200.7 Rev. 4.4	Barium	25.0		ug/L	P389029	
		Calcium	15.5		mg/L	P389029	
		Iron	980		ug/L	P389029	
		Magnesium	1.80		mg/L	P389029	
		Potassium	1.9		mg/L	P389029	
		Sodium	5.2		mg/L	P389029	
		Zinc	5.0	U	ug/L	P389029	
	EPA 200.8 Rev. 5.4	Aluminum	498		ug/L	P389029	
		Antimony	0.066	I	ug/L	P389029	
		Arsenic	0.53		ug/L	P389029	
		Beryllium	0.047		ug/L	P389029	
		Boron**	17.7		ug/L	P389029	
		Cadmium	0.020	U	ug/L	P389029	
		Chromium	1.0	I	ug/L	P389029	
		Copper	0.83		ug/L	P389029	
		Lead	0.43		ug/L	P389029	
		Nickel	0.55	I	ug/L	P389029	
		Selenium	0.20	U	ug/L	P389029	
		Silver	0.010	U	ug/L	P389029	
		Thallium	0.10	U	ug/L	P389029	
	SM 2340B	Hardness	46.0		mg/L	P389029	

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: P388976

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P389029

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: P389029

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: P389373

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389376

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389201

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389097

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389187

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389154

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389175

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388987

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

Reference Method: SM 2120 B-2011
Batch ID: P388984

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P389229

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

Reference Method: SM 2540 C-2011
Batch ID: P389381

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P389382

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P389309

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P389310

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P389118

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P389068

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: P389029

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	103		P	85 - 115
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	103		P	85 - 115
Sodium	105		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P389029

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	109		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	101		P	85 - 115
Beryllium	101		P	85 - 115
Boron	104		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	101		P	85 - 115
Copper	97.6		P	85 - 115
Lead	97.1		P	85 - 115
Nickel	98.5		P	85 - 115
Selenium	101		P	85 - 115
Silver	97.4		P	85 - 115
Thallium	98.5		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389373

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389376

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389201

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389097

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	108		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389187

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389154

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389175

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388987

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.5		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P388984

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P389229

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

Reference Method: SM 4500 F-C-2011
Batch ID: P389118

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

Reference Method: SM 5310 B-2011
Batch ID: P389068

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: P389029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203379	Barium	105		P	80 - 120
2203379	Calcium	104		P	80 - 120
2203379	Iron	107		P	80 - 120
2203379	Magnesium	109		P	80 - 120
2203379	Potassium	103		P	80 - 120
2203379	Sodium	101		P	80 - 120
2203379	Zinc	102		P	80 - 120
2203607	Barium	108	104	P/P	80 - 120
2203607	Calcium	108	106	P/P	80 - 120
2203607	Iron	109	107	P/P	80 - 120
2203607	Magnesium	110	108	P/P	80 - 120
2203607	Potassium	103	102	P/P	80 - 120
2203607	Sodium	101		P	80 - 120
2203607	Zinc	106	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P389029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203379	Aluminum	101		P	80 - 120
2203379	Antimony	99.2		P	80 - 120
2203379	Arsenic	101		P	80 - 120
2203379	Beryllium	99.8		P	80 - 120
2203379	Boron	102		P	80 - 120
2203379	Cadmium	102		P	80 - 120
2203379	Chromium	99.4		P	80 - 120
2203379	Copper	96.7		P	80 - 120
2203379	Lead	95.1		P	80 - 120
2203379	Nickel	97.4		P	80 - 120
2203379	Selenium	97.0		P	80 - 120
2203379	Silver	96.6		P	80 - 120
2203379	Thallium	98.0		P	80 - 120
2203607	Aluminum	103	104	P/P	80 - 120
2203607	Antimony	102	102	P/P	80 - 120
2203607	Arsenic	100	102	P/P	80 - 120
2203607	Beryllium	96.7	99.2	P/P	80 - 120
2203607	Boron	101	104	P/P	80 - 120
2203607	Cadmium	103	103	P/P	80 - 120
2203607	Chromium	99.7	98.7	P/P	80 - 120
2203607	Copper	97.3	97.6	P/P	80 - 120
2203607	Lead	95.9	96.2	P/P	80 - 120
2203607	Nickel	97.8	98.0	P/P	80 - 120
2203607	Selenium	94.3	95.7	P/P	80 - 120
2203607	Silver	95.7	96.9	P/P	80 - 120
2203607	Thallium	98.0	98.7	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203363	Chloride	106		P	90 - 110
2203407	Chloride	103		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389376

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203363	Sulfate	104		P	90 - 110
2203407	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389201

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203408	Ammonia-N	102	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203368	Kjeldahl Nitrogen	104	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389187

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203402	Kjeldahl Nitrogen	101	90.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389154

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202998	NO2NO3-N	98.5	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389175

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203351	Total-P	108	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388987

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203273	O-Phosphate-P	98.9	98.3	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P389118

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203350	Fluoride	103	105	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P389068

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203286	Organic Carbon	100	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P388976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203363	Turbidity	5.35	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P389029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203607	Barium	3.86	Spike	P	0 - 20
2203607	Calcium	1.37	Spike	P	0 - 20
2203607	Iron	1.27	Spike	P	0 - 20
2203607	Magnesium	1.50	Spike	P	0 - 20
2203607	Potassium	0.574	Spike	P	0 - 20
2203607	Sodium	0.0891	Spike	P	0 - 20
2203607	Zinc	3.26	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P389029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203607	Aluminum	1.35	Spike	P	0 - 20
2203607	Antimony	0.260	Spike	P	0 - 20
2203607	Arsenic	1.49	Spike	P	0 - 20
2203607	Beryllium	2.12	Spike	P	0 - 20
2203607	Boron	2.74	Spike	P	0 - 20
2203607	Cadmium	0.0805	Spike	P	0 - 20
2203607	Chromium	0.975	Spike	P	0 - 20
2203607	Copper	0.263	Spike	P	0 - 20
2203607	Lead	0.347	Spike	P	0 - 20
2203607	Nickel	0.263	Spike	P	0 - 20
2203607	Selenium	1.45	Spike	P	0 - 20
2203607	Silver	1.29	Spike	P	0 - 20
2203607	Thallium	0.747	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P389373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203363	Chloride	0.487	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P389376

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203363	Sulfate	0.720	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389201

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203408	Ammonia-N	2.11	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203368	Kjeldahl Nitrogen	0.296	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389187

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203402	Kjeldahl Nitrogen	8.50	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389154

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202998	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389175

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203351	Total-P	0.707	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203273	O-Phosphate-P	0.476	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P388984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203350	Color (true)	1.31	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P389229

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204122	Total Alkalinity	1.10	Sample	P	0 - 8.1

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P389381

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203271	TDS	6.59	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
Batch ID: P389382

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203456	TDS	1.08	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P389118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203350	Fluoride	2.01	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P389068

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203286	Organic Carbon	0.718	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A101640

Included Lab Sample IDs: 2203363, 2203366, 2203367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.0	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A101644

Included Lab Sample IDs: 2203363, 2203366, 2203367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101645

Included Lab Sample IDs: 2203365, 2203370, 2203371

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	98.9	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A101673

Included Lab Sample IDs: 2203364, 2203368, 2203369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.0	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A101694

Included Lab Sample IDs: 2203363, 2203366, 2203367

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A101702

Included Lab Sample IDs: 2203378, 2203379

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	100	P/P	90 - 110
Calcium	99.7	100	P/P	90 - 110
Iron	99.9	101	P/P	90 - 110
Magnesium	99.9	100	P/P	90 - 110
Potassium	97.6	98.4	P/P	90 - 110
Sodium	99.6	100	P/P	90 - 110
Zinc	102	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101724

Included Lab Sample IDs: 2203364, 2203368, 2203369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101732

Included Lab Sample IDs: 2203364, 2203368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	104	P/P	90 - 110
Kjeldahl Nitrogen	104	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101736

Included Lab Sample IDs: 2203364, 2203368, 2203369

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

Reference Method: SM 2320 B-2011

Run ID: A101749

Included Lab Sample IDs: 2203363, 2203366, 2203367

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.5	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101768

Included Lab Sample IDs: 2203369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	109	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A101777

Included Lab Sample IDs: 2203378, 2203379

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	98.6	99.3	P/P	90 - 110
Arsenic	99.1	98.4	P/P	90 - 110
Beryllium	99.9	98.7	P/P	90 - 110
Boron	102	101	P/P	90 - 110
Cadmium	99.7	100	P/P	90 - 110
Chromium	95.2	96.2	P/P	90 - 110
Copper	94.5	94.6	P/P	90 - 110
Lead	96.2	95.4	P/P	90 - 110
Nickel	94.3	96.4	P/P	90 - 110
Selenium	100	99.4	P/P	90 - 110
Silver	99.0	99.1	P/P	90 - 110
Thallium	94.2	92.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101787

Included Lab Sample IDs: 2203364, 2203368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	93.5	94.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A101798

Included Lab Sample IDs: 2203363, 2203366, 2203367

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101819

Included Lab Sample IDs: 2203369

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	92.2	90.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A101828

Included Lab Sample IDs: 2203378, 2203379

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	99.7	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					5.35	
EPA 200.7 Rev. 4.4	Barium	103	105	108	104		3.86
	Calcium	106	104	108	106		1.37
	Iron	105	107	109	107		1.27
	Magnesium	105	109	110	108		1.50
	Potassium	103	103	103	102		0.574
	Sodium	105	101	101			0.0891
	Zinc	100	102	106	103		3.26
EPA 200.8 Rev. 5.4	Aluminum	109	103	104	101		1.35
	Antimony	103	102	102	99.2		0.260
	Arsenic	101	100	102	101		1.49
	Beryllium	101	96.7	99.2	99.8		2.12
	Boron	104	101	104	102		2.74
	Cadmium	102	103	103	102		0.0805
	Chromium	101	99.7	98.7	99.4		0.975
	Copper	97.6	97.3	97.6	96.7		0.263
	Lead	97.1	95.9	96.2	95.1		0.347
	Nickel	98.5	97.8	98.0	97.4		0.263
	Selenium	101	94.3	95.7	97.0		1.45
	Silver	97.4	95.7	96.9	96.6		1.29
	Thallium	98.5	98.0	98.7	98.0		0.747
EPA 300.0 Rev. 2.1	Chloride	102	106	103		0.487	
	Sulfate	103	104	103		0.720	
EPA 350.1 Rev. 2.0	Ammonia-N	100	102	98.9			2.11
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	104	103			0.296
	Kjeldahl Nitrogen	106	101	90.6			8.50
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.5	98.5			0.0
EPA 365.1 Rev. 2.0	Total-P	107	108	107			0.707
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.5	98.9	98.3			0.476
SM 2120 B-2011	Color (true)	100				1.31	
SM 2320 B-2011	Total Alkalinity	101				1.10	
SM 2540 C-2011	TDS					6.59	
	TDS					1.08	
SM 4500 F-C-2011	Fluoride	99.3	103	105			2.01
SM 5310 B-2011	Organic Carbon	99.2	100	101			0.718

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2203363, 2203366, 2203367
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2203378, 2203379
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2203378, 2203379
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2203363, 2203366, 2203367
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2203363, 2203366, 2203367
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2203364, 2203368, 2203369
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2203364, 2203368, 2203369
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2203364, 2203368, 2203369
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2203364, 2203368, 2203369
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2203365, 2203370, 2203371
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2203363, 2203366, 2203367

Reference Method Descriptions

Method	Description	Associated Samples
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2203363, 2203366, 2203367
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2203378, 2203379
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2203363, 2203366, 2203367
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2203363, 2203366, 2203367
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2203363, 2203366, 2203367
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2203364, 2203368, 2203369

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	10/20/2020			10/20/2020 16:02	Yen Ta	2203363, 2203366, 2203367
EPA 200.7 Rev. 4.4	10/20/2020	10/21/2020 15:25	Elliott D. Healy	10/22/2020 15:32	Betina Topolski	2203378
	10/20/2020	10/21/2020 15:25	Elliott D. Healy	10/22/2020 15:40	Betina Topolski	2203379
EPA 200.8 Rev. 5.4	10/20/2020	10/21/2020 15:25	Elliott D. Healy	10/26/2020 16:11	Alexander Thompson	2203378
	10/20/2020	10/21/2020 15:25	Elliott D. Healy	10/26/2020 16:26	Alexander Thompson	2203379
	10/20/2020	10/21/2020 15:25	Elliott D. Healy	10/28/2020 15:46	Alexander Thompson	2203378
	10/20/2020	10/21/2020 15:25	Elliott D. Healy	10/28/2020 15:54	Alexander Thompson	2203379
EPA 300.0 Rev. 2.1	10/20/2020			10/27/2020 22:34	Lipi Saha	2203363
	10/20/2020			10/27/2020 23:53	Lipi Saha	2203366
	10/20/2020			10/28/2020 00:06	Lipi Saha	2203367
EPA 350.1 Rev. 2.0	10/20/2020			10/24/2020 16:52	Ping Hua	2203364
	10/20/2020			10/24/2020 16:54	Ping Hua	2203368
	10/20/2020			10/24/2020 16:55	Ping Hua	2203369
EPA 351.2 Rev. 2.0	10/20/2020	10/22/2020 13:40	David Boose	10/23/2020 16:19	Elliott Rodriguez	2203368
	10/20/2020	10/22/2020 13:40	David Boose	10/23/2020 16:40	Elliott Rodriguez	2203364
	10/20/2020	10/23/2020 14:00	David Boose	10/26/2020 12:19	Elliott Rodriguez	2203369
EPA 353.2 Rev. 2.0	10/20/2020			10/23/2020 10:14	Beverly Y. Sanders	2203364
	10/20/2020			10/23/2020 10:15	Beverly Y. Sanders	2203368
	10/20/2020			10/23/2020 10:16	Beverly Y. Sanders	2203369
EPA 365.1 Rev. 2.0	10/20/2020	10/23/2020 15:15	Shengyu Wang	10/27/2020 10:47	Shengyu Wang	2203364
	10/20/2020	10/23/2020 15:15	Shengyu Wang	10/27/2020 10:48	Shengyu Wang	2203368
	10/20/2020	10/23/2020 15:15	Shengyu Wang	10/28/2020 12:10	Shengyu Wang	2203369
EPA 365.1 Rev. 2.0 dissolved	10/20/2020			10/20/2020 16:21	Samantha Davila	2203365
	10/20/2020			10/20/2020 16:22	Samantha Davila	2203370
	10/20/2020			10/20/2020 16:23	Samantha Davila	2203371
SM 2120 B-2011	10/20/2020			10/20/2020 17:10	Benjamin T. Nordmann	2203363
	10/20/2020			10/20/2020 17:11	Benjamin T. Nordmann	2203366, 2203367
SM 2320 B-2011	10/20/2020			10/24/2020 00:37	Samantha Davila	2203363
	10/20/2020			10/24/2020 00:46	Samantha Davila	2203366
	10/20/2020			10/24/2020 00:55	Samantha Davila	2203367
SM 2340B	10/20/2020			10/22/2020 15:32	Betina Topolski	2203378
	10/20/2020			10/22/2020 15:40	Betina Topolski	2203379
SM 2540 C-2011	10/20/2020			10/21/2020 15:19	Yijie Li	2203363, 2203366, 2203367
SM 2540 D-2011	10/20/2020			10/21/2020 15:19	Yijie Li	2203363, 2203366, 2203367
SM 4500 F-C-2011	10/20/2020			10/22/2020 09:40	Samantha Davila	2203363
	10/20/2020			10/22/2020 09:52	Samantha Davila	2203366
	10/20/2020			10/22/2020 10:04	Samantha Davila	2203367
SM 5310 B-2011	10/20/2020			10/21/2020 20:58	Lauren Lees	2203364
	10/20/2020			10/21/2020 21:10	Lauren Lees	2203368
	10/20/2020			10/21/2020 21:22	Lauren Lees	2203369