

Chemical Analysis Report

TLH-ROC-2021-03-03-01

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

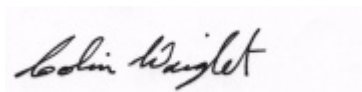
Event Description: **RPS/LVI**
Request ID: **RQ-2021-02-22-38**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
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Certified by: Colin Wright, Program Administrator

Date Certified: 23-MAR-2021 10:33

A handwritten signature in black ink, appearing to read "Colin Wright", is shown on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Gully Branch 80m north of Gully Branch Rd

Collection Date/Time: 03/03/2021 10:20

Field ID: G2TLHR0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2228863	EPA 180.1 Rev. 2.0	Turbidity	5.5		NTU	P394453	
	EPA 300.0 Rev. 2.1	Chloride	5.6		mg Cl/L	P394698	
		Sulfate	0.30	I	mg SO4/L	P394700	
		Color (true)	300		PCU	P394431	
	SM 2120 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P394733	
	SM 2540 C-2011	TDS	63		mg/L	P394829	
	SM 2540 D-2011	TSS	3	I	mg/L	P394834	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P394738	
2228864	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P394583	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.74		mg N/L	P394658	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P394459	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P394547	
	SM 5310 B-2011	Organic Carbon	26		mg C/L	P395016	
2228865	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P394432	
2228870	EPA 200.7 Rev. 4.4	Barium	5.6		ug/L	P394430	
		Calcium	2.07		mg/L	P394430	
		Iron	1.11E+03		ug/L	P394430	
		Magnesium	0.39		mg/L	P394430	
		Manganese	3.9	I	ug/L	P394430	
		Potassium	0.30	U	mg/L	P394430	
		Sodium	3.1		mg/L	P394430	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P394430	
		Aluminum	638		ug/L	P394430	
		Antimony	0.050	U	ug/L	P394430	
		Arsenic	0.27		ug/L	P394430	
		Beryllium	0.027	I	ug/L	P394430	
		Boron**	10.9		ug/L	P394430	
		Cadmium	0.020	U	ug/L	P394430	
		Chromium	0.72	I	ug/L	P394430	
		Copper	0.48	I	ug/L	P394430	
		Lead	0.57		ug/L	P394430	
		Nickel	0.51	I	ug/L	P394430	
		Selenium	0.20	U	ug/L	P394430	
		Silver	0.010	U	ug/L	P394430	
		Thallium	0.10	U	ug/L	P394430	
	SM 2340B	Hardness	6.8		mg/L	P394430	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 03/16/2021.

Sample Location: Crooked River @ Post 46

Collection Date/Time: 03/03/2021 11:10

Field ID: G2TLHR0038

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2228860	EPA 180.1 Rev. 2.0	Turbidity	12	A	NTU	P394453	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P394698	
		Sulfate	2.8		mg SO4/L	P394700	
	SM 2120 B-2011	Color (true)	270		PCU	P394431	
	SM 2320 B-2011	Total Alkalinity	7.3		mg CaCO3/L	P394733	
	SM 2540 C-2011	TDS	93		mg/L	P394829	
	SM 2540 D-2011	TSS	22		mg/L	P394834	
	SM 4500 F-C-2011	Fluoride	0.048	I	mg F/L	P394738	
2228861	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P394583	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.83		mg N/L	P394658	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.024		mg N/L	P394459	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P394547	
	SM 5310 B-2011	Organic Carbon	20		mg C/L	P395016	
2228862	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P394432	

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: P394453

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P394430

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: P394430

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: P394698

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394700

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394583

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: P394658

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394459

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394547

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394432

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

Reference Method: SM 2120 B-2011
Batch ID: P394431

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P394733

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P394829

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P394834

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P394738

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P395016

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: P394430

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.1		P	85 - 115
Calcium	105		P	85 - 115
Iron	103		P	85 - 115
Magnesium	101		P	85 - 115
Manganese	98.3		P	85 - 115
Potassium	102		P	85 - 115
Sodium	104		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P394430

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.9		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	99.1		P	85 - 115
Beryllium	97.5		P	85 - 115
Boron	101		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	96.9		P	85 - 115
Copper	96.2		P	85 - 115
Lead	102		P	85 - 115
Nickel	97.2		P	85 - 115
Selenium	97.7		P	85 - 115
Silver	102		P	85 - 115
Thallium	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394698

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394700

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394583

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394658

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: P394459

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: P394547

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394432

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.6		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P394431

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.8		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P394733

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.3		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P394738

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.6		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P395016

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P394430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228780	Barium	103	103	P/P	80 - 120
2228780	Calcium	105		P	80 - 120
2228780	Iron	109	107	P/P	80 - 120
2228780	Magnesium	101		P	80 - 120
2228780	Manganese	103	102	P/P	80 - 120
2228780	Potassium	107	104	P/P	80 - 120
2228780	Sodium	109	105	P/P	80 - 120
2228780	Zinc	106	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P394430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228780	Aluminum	93.2	95.0	P/P	80 - 120
2228780	Antimony	104	106	P/P	80 - 120
2228780	Arsenic	97.3	98.0	P/P	80 - 120
2228780	Beryllium	99.0	98.2	P/P	80 - 120
2228780	Boron	102	107	P/P	80 - 120
2228780	Cadmium	102	102	P/P	80 - 120
2228780	Chromium	95.6	98.6	P/P	80 - 120
2228780	Copper	91.4	92.6	P/P	80 - 120
2228780	Lead	100	102	P/P	80 - 120
2228780	Nickel	91.6	92.5	P/P	80 - 120
2228780	Selenium	97.8	96.6	P/P	80 - 120
2228780	Silver	102	103	P/P	80 - 120
2228780	Thallium	108	109	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P394698

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228774	Chloride	99.7		P	90 - 110
2228990	Chloride	92.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P394700

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228774	Sulfate	96.3		P	90 - 110
2228990	Sulfate	98.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P394583

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228939	Ammonia-N	95.2	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P394658

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228874	Kjeldahl Nitrogen	106	107	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394459

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228775	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394547

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228195	Total-P	108	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394432

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228862	O-Phosphate-P	97.1	96.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P394738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2229519	Fluoride	98.5	96.8	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P395016

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228991	Organic Carbon	96.0	94.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P394453

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228860	Turbidity	1.61	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P394430

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228780	Barium	0.223	Spike	P	0 - 20
2228780	Calcium	0.984	Spike	P	0 - 20
2228780	Iron	1.33	Spike	P	0 - 20
2228780	Magnesium	1.25	Spike	P	0 - 20
2228780	Manganese	0.899	Spike	P	0 - 20
2228780	Potassium	2.62	Spike	P	0 - 20
2228780	Sodium	2.35	Spike	P	0 - 20
2228780	Zinc	0.199	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P394430

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228780	Aluminum	1.92	Spike	P	0 - 20
2228780	Antimony	1.58	Spike	P	0 - 20
2228780	Arsenic	0.712	Spike	P	0 - 20
2228780	Beryllium	0.819	Spike	P	0 - 20
2228780	Boron	4.00	Spike	P	0 - 20
2228780	Cadmium	0.0761	Spike	P	0 - 20
2228780	Chromium	3.10	Spike	P	0 - 20
2228780	Copper	1.21	Spike	P	0 - 20
2228780	Lead	1.31	Spike	P	0 - 20
2228780	Nickel	1.03	Spike	P	0 - 20
2228780	Selenium	1.26	Spike	P	0 - 20
2228780	Silver	1.57	Spike	P	0 - 20
2228780	Thallium	1.57	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P394698

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228774	Chloride	0.911	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P394700

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228774	Sulfate	0.456	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228939	Ammonia-N	2.88	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394658

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228874	Kjeldahl Nitrogen	1.23	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228775	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394547

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228195	Total-P	3.69	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394432

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228862	O-Phosphate-P	0.181	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P394431

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228774	Color (true)	0.716	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P394733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2229519	Total Alkalinity	0.827	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P394829

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228947	TDS	1.73	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P394738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2229519	Fluoride	0.946	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P395016

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228991	Organic Carbon	1.02	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B-2011

Run ID: A103863

Included Lab Sample IDs: 2228860, 2228863

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A103864

Included Lab Sample IDs: 2228862, 2228865

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	98.4	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A103876

Included Lab Sample IDs: 2228860, 2228863

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	101	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103879

Included Lab Sample IDs: 2228861, 2228864

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A103898

Included Lab Sample IDs: 2228870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	104	P/P	90 - 110
Calcium	99.3	100	P/P	90 - 110
Iron	97.4	100	P/P	90 - 110
Magnesium	96.9	99.4	P/P	90 - 110
Manganese	98.5	100	P/P	90 - 110
Potassium	96.8	98.2	P/P	90 - 110
Sodium	97.3	98.2	P/P	90 - 110
Zinc	97.5	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A103921

Included Lab Sample IDs: 2228861, 2228864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103950

Included Lab Sample IDs: 2228861, 2228864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A103974

Included Lab Sample IDs: 2228860, 2228863

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.9	100	P/P	90 - 110
Sulfate	99.3	99.4	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A103989

Included Lab Sample IDs: 2228860, 2228863

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	96.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A103989

Included Lab Sample IDs: 2228860, 2228863

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A104011

Included Lab Sample IDs: 2228861, 2228864

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104055

Included Lab Sample IDs: 2228870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.7	99.4	P/P	90 - 110
Antimony	102	103	P/P	90 - 110
Arsenic	97.9	97.7	P/P	90 - 110
Beryllium	101	100	P/P	90 - 110
Cadmium	99.6	101	P/P	90 - 110
Chromium	102	103	P/P	90 - 110
Copper	93.5	93.8	P/P	90 - 110
Lead	101	101	P/P	90 - 110
Nickel	97.2	97.0	P/P	90 - 110
Selenium	97.2	99.6	P/P	90 - 110
Silver	97.7	98.8	P/P	90 - 110
Thallium	107	106	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104075

Included Lab Sample IDs: 2228870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	95.8	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A104080

Included Lab Sample IDs: 2228861, 2228864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.5	94.7	P/P	90 - 110
Organic Carbon	94.7	93.8	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	SMP
EPA 180.1 Rev. 2.0	Turbidity					1.61
EPA 200.7 Rev. 4.4	Barium	99.1	103	103		0.223
	Calcium	105	105			0.984
	Iron	103	109	107		1.33
	Magnesium	101	101			1.25
	Manganese	98.3	103	102		0.899
	Potassium	102	107	104		2.62
	Sodium	104	109	105		2.35
	Zinc	105	106	107		0.199
EPA 200.8 Rev. 5.4	Aluminum	94.9	93.2	95.0		1.92
	Antimony	104	104	106		1.58
	Arsenic	99.1	97.3	98.0		0.712
	Beryllium	97.5	99.0	98.2		0.819
	Boron	101	102	107		4.00
	Cadmium	100	102	102		0.0761
	Chromium	96.9	95.6	98.6		3.10
	Copper	96.2	91.4	92.6		1.21
	Lead	102	100	102		1.31
	Nickel	97.2	91.6	92.5		1.03
	Selenium	97.7	97.8	96.6		1.26
	Silver	102	102	103		1.57
	Thallium	107	108	109		1.57
EPA 300.0 Rev. 2.1	Chloride	101	99.7	92.4		0.911
	Sulfate	98.8	96.3	98.6		0.456
EPA 350.1 Rev. 2.0	Ammonia-N	99.4	95.2	98.4		2.88
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	106	107		1.23
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	102	102		0.0
EPA 365.1 Rev. 2.0	Total-P	104	108	103		3.69
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.6	97.1	96.9		0.181
SM 2120 B-2011	Color (true)	98.8				0.716
SM 2320 B-2011	Total Alkalinity	99.3				0.827
SM 2540 C-2011	TDS					1.73
SM 4500 F-C-2011	Fluoride	99.6	98.5	96.8		0.946
SM 5310 B-2011	Organic Carbon	94.3	96.0	94.6		1.02

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2228860, 2228863
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2228870
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2228870
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2228860, 2228863
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2228860, 2228863
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2228861, 2228864
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2228861, 2228864
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2228861, 2228864
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2228861, 2228864
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2228862, 2228865
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2228860, 2228863
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2228860, 2228863

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2228870
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2228860, 2228863
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2228860, 2228863
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2228860, 2228863
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2228861, 2228864

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	03/03/2021			03/03/2021 15:22	Blanca Fach	2228860, 2228863
EPA 200.7 Rev. 4.4	03/03/2021	03/03/2021 15:40	Elliott D. Healy	03/04/2021 18:54	Betina Topolski	2228870
EPA 200.8 Rev. 5.4	03/03/2021	03/03/2021 15:40	Elliott D. Healy	03/12/2021 17:50	McKinley C Carter	2228870
	03/03/2021	03/03/2021 15:40	Elliott D. Healy	03/15/2021 16:52	McKinley C Carter	2228870
EPA 300.0 Rev. 2.1	03/03/2021			03/08/2021 20:49	Lipi Saha	2228860
	03/03/2021			03/08/2021 21:01	Lipi Saha	2228863
EPA 350.1 Rev. 2.0	03/03/2021			03/05/2021 17:12	Ping Hua	2228864
	03/03/2021			03/05/2021 17:17	Ping Hua	2228861
EPA 351.2 Rev. 2.0	03/03/2021	03/09/2021 12:41	Benjamin T. Nordmann	03/11/2021 11:11	Virginia P. Brown	2228861
	03/03/2021	03/09/2021 12:41	Benjamin T. Nordmann	03/11/2021 11:12	Virginia P. Brown	2228864
EPA 353.2 Rev. 2.0	03/03/2021			03/04/2021 10:09	Beverly Y. Sanders	2228861
	03/03/2021			03/04/2021 10:10	Beverly Y. Sanders	2228864
EPA 365.1 Rev. 2.0	03/03/2021	03/05/2021 13:30	Lipi Saha	03/08/2021 13:51	Shengyu Ding	2228861
	03/03/2021	03/05/2021 13:30	Lipi Saha	03/08/2021 13:52	Shengyu Ding	2228864
EPA 365.1 Rev. 2.0 dissolved	03/03/2021			03/03/2021 15:40	Samantha Davila	2228862
	03/03/2021			03/03/2021 15:43	Samantha Davila	2228865
SM 2120 B-2011	03/03/2021			03/03/2021 15:57	Benjamin T. Nordmann	2228860, 2228863
SM 2320 B-2011	03/03/2021			03/09/2021 21:58	Dale L. Simmons	2228860
	03/03/2021			03/09/2021 22:06	Dale L. Simmons	2228863
SM 2340B	03/03/2021			03/04/2021 18:54	Betina Topolski	2228870
SM 2540 C-2011	03/03/2021			03/08/2021 14:25	Yijie Li	2228860, 2228863
SM 2540 D-2011	03/03/2021			03/08/2021 14:25	Yijie Li	2228860, 2228863
SM 4500 F-C-2011	03/03/2021			03/09/2021 21:58	Dale L. Simmons	2228860
	03/03/2021			03/09/2021 22:06	Dale L. Simmons	2228863
SM 5310 B-2011	03/03/2021			03/15/2021 23:37	Madeline Gruver	2228861
	03/03/2021			03/16/2021 00:11	Madeline Gruver	2228864