

Chemical Analysis Report

CEN-DIST-2020-10-07-02

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

Event Description: **Lake Marshal/Roberts Branch**
Request ID: **RQ-2020-10-05-62**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:

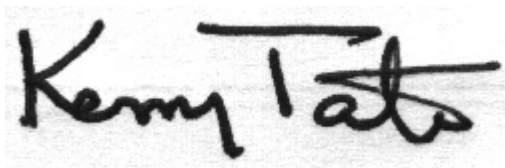
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 27-OCT-2020 11:37

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the top of the "T".

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 Felter @ Center

Collection Date/Time: 10/06/2020 11:12

Field ID: G1CE0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2200334	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P388351	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P388632	
		Sulfate	1.1		mg SO4/L	P388635	
		Color (true)	64		PCU	P388354	
	SM 2320 B-2011	Total Alkalinity	17		mg CaCO3/L	P388574	
	SM 2540 C-2011	TDS	75		mg/L	P388805	
	SM 2540 D-2011	TSS	2	U	mg/L	P388779	
	SM 4500 F-C-2011	Fluoride	0.074	I	mg F/L	P388577	
2200335	EPA 350.1 Rev. 2.0	Ammonia-N	0.063		mg N/L	P388496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P388460	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P388517	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P388452	
	SM 5310 B-2011	Organic Carbon	21		mg C/L	P388444	
2200336	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P388368	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high 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.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Marshall Lake @ Center

Collection Date/Time: 10/06/2020 12:32

Field ID: G1CE0110

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2200331	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P388351	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P388632	
		Sulfate	14		mg SO4/L	P388635	
	SM 2120 B-2011	Color (true)	40	A	PCU	P388354	
	SM 2320 B-2011	Total Alkalinity	45		mg CaCO3/L	P388574	
	SM 2540 C-2011	TDS	104		mg/L	P388805	
	SM 2540 D-2011	TSS	3	I	mg/L	P388779	
2200332	SM 4500 F-C-2011	Fluoride	0.070	I	mg F/L	P388577	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P388496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.98		mg N/L	P388460	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388517	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P388452	
2200333	SM 5310 B-2011	Organic Carbon	11		mg C/L	P388444	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P388368	
2200340	EPA 200.7 Rev. 4.4	Barium	8.8		ug/L	P388399	
		Calcium	19.4		mg/L	P388399	
		Iron	40	I	ug/L	P388399	
		Magnesium	3.30		mg/L	P388399	
		Potassium	3.5		mg/L	P388399	
		Sodium	7.8		mg/L	P388399	
		Zinc	16	I	ug/L	P388399	
	EPA 200.8 Rev. 5.4	Aluminum	11	I	ug/L	P388399	
		Antimony	0.16	I	ug/L	P388399	
		Arsenic	1.29		ug/L	P388399	
		Beryllium	0.010	U	ug/L	P388399	
		Boron**	34.3		ug/L	P388399	
		Cadmium	0.047	I	ug/L	P388399	
		Chromium	0.40	U	ug/L	P388399	
		Copper	0.54	I	ug/L	P388399	
		Lead	0.20	U	ug/L	P388399	
		Nickel	0.50	U	ug/L	P388399	
		Selenium	0.20	U	ug/L	P388399	
		Silver	0.010	U	ug/L	P388399	
		Thallium	0.10	U	ug/L	P388399	
	SM 2340B	Hardness	62.1		mg/L	P388399	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high 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.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388351

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388399

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: P388399

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: P388632

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388635

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388496

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: P388460

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388517

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388452

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388368

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

Reference Method: SM 2120 B-2011
Batch ID: P388354

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P388574

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

Reference Method: SM 2540 C-2011
Batch ID: P388805

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P388779

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P388577

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: P388444

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: P388399

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	106		P	85 - 115
Calcium	102		P	85 - 115
Iron	109		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	103		P	85 - 115
Sodium	108		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388399

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	104		P	85 - 115
Beryllium	96.5		P	85 - 115
Boron	98.0		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	103		P	85 - 115
Copper	104		P	85 - 115
Lead	99.7		P	85 - 115
Nickel	104		P	85 - 115
Selenium	103		P	85 - 115
Silver	97.9		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388632

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388635

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388496

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: P388460

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388517

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388452

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388368

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.6		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P388354

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.6		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P388574

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.8		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P388577

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P388444

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388399

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200325	Barium	104	107	P/P	80 - 120
2200325	Calcium	103		P	80 - 120
2200325	Iron	114	107	P/P	80 - 120
2200325	Magnesium	113	105	P/P	80 - 120
2200325	Potassium	105	101	P/P	80 - 120
2200325	Sodium	110	105	P/P	80 - 120
2200325	Zinc	99.7	102	P/P	80 - 120
2200340	Barium	105		P	80 - 120
2200340	Calcium	99.2		P	80 - 120
2200340	Iron	108		P	80 - 120
2200340	Magnesium	103		P	80 - 120
2200340	Potassium	99.0		P	80 - 120
2200340	Sodium	103		P	80 - 120
2200340	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388399

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200325	Aluminum	100	102	P/P	80 - 120
2200325	Antimony	104	105	P/P	80 - 120
2200325	Arsenic	103	104	P/P	80 - 120
2200325	Beryllium	95.9	98.7	P/P	80 - 120
2200325	Boron	102	105	P/P	80 - 120
2200325	Cadmium	101	103	P/P	80 - 120
2200325	Chromium	101	100	P/P	80 - 120
2200325	Copper	103	103	P/P	80 - 120
2200325	Lead	98.4	99.5	P/P	80 - 120
2200325	Nickel	101	102	P/P	80 - 120
2200325	Selenium	96.2	99.9	P/P	80 - 120
2200325	Silver	97.6	95.7	P/P	80 - 120
2200325	Thallium	101	103	P/P	80 - 120
2200340	Aluminum	103		P	80 - 120
2200340	Antimony	107		P	80 - 120
2200340	Arsenic	105		P	80 - 120
2200340	Beryllium	96.8		P	80 - 120
2200340	Boron	103		P	80 - 120
2200340	Cadmium	103		P	80 - 120
2200340	Chromium	105		P	80 - 120
2200340	Copper	104		P	80 - 120
2200340	Lead	101		P	80 - 120
2200340	Nickel	103		P	80 - 120
2200340	Selenium	99.1		P	80 - 120
2200340	Silver	98.6		P	80 - 120
2200340	Thallium	106		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388632

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200313	Chloride	106		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388635

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200313	Sulfate	103		P	90 - 110
2200498	Sulfate	97.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388496

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200332	Ammonia-N	99.8	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200332	NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200336	O-Phosphate-P	95.4	95.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P388577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200694	Fluoride	98.1	98.8	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P388444

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200192	Organic Carbon	101	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388351

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200313	Turbidity	2.65	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388399

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200325	Barium	2.35	Spike	P	0 - 20
2200325	Calcium	3.37	Spike	P	0 - 20
2200325	Iron	5.15	Spike	P	0 - 20
2200325	Magnesium	4.62	Spike	P	0 - 20
2200325	Potassium	3.99	Spike	P	0 - 20
2200325	Sodium	2.52	Spike	P	0 - 20
2200325	Zinc	2.39	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388399

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200325	Aluminum	2.14	Spike	P	0 - 20
2200325	Antimony	0.621	Spike	P	0 - 20
2200325	Arsenic	0.989	Spike	P	0 - 20
2200325	Beryllium	2.93	Spike	P	0 - 20
2200325	Boron	2.18	Spike	P	0 - 20
2200325	Cadmium	1.37	Spike	P	0 - 20
2200325	Chromium	0.409	Spike	P	0 - 20
2200325	Copper	0.182	Spike	P	0 - 20
2200325	Lead	1.12	Spike	P	0 - 20
2200325	Nickel	0.217	Spike	P	0 - 20
2200325	Selenium	3.75	Spike	P	0 - 20
2200325	Silver	1.93	Spike	P	0 - 20
2200325	Thallium	1.89	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388632

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200313	Chloride	3.30	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200313	Sulfate	1.01	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388496

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200332	Ammonia-N	0.754	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200335	Kjeldahl Nitrogen	7.63	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200332	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200315	Total-P	1.71	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200336	O-Phosphate-P	0.314	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P388354

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200331	Color (true)	4.83	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P388574

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200694	Total Alkalinity	1.20	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P388805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200308	TDS	0.195	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P388577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200694	Fluoride	0.467	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P388444

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200192	Organic Carbon	0.220	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: A101415

Included Lab Sample IDs: 2200331, 2200334

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

Reference Method: SM 2120 B-2011

Run ID: A101417

Included Lab Sample IDs: 2200331, 2200334

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.0	99.1	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101426

Included Lab Sample IDs: 2200333, 2200336

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.3	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A101446

Included Lab Sample IDs: 2200332, 2200335

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	97.2	P/P	90 - 110
Organic Carbon	98.6	97.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101460

Included Lab Sample IDs: 2200332, 2200335

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101468

Included Lab Sample IDs: 2200332, 2200335

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101471

Included Lab Sample IDs: 2200332, 2200335

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	94.5	94.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101474

Included Lab Sample IDs: 2200332, 2200335

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.6	98.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A101476

Included Lab Sample IDs: 2200340

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	99.4	102	P/P	90 - 110
Arsenic	99.7	99.2	P/P	90 - 110
Beryllium	98.2	99.6	P/P	90 - 110
Boron	100	102	P/P	90 - 110
Cadmium	97.1	98.4	P/P	90 - 110
Chromium	97.4	97.3	P/P	90 - 110
Copper	98.2	98.0	P/P	90 - 110
Lead	97.2	98.8	P/P	90 - 110
Nickel	98.2	97.6	P/P	90 - 110
Selenium	95.3	95.2	P/P	90 - 110
Silver	99.9	102	P/P	90 - 110
Thallium	94.8	95.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A101477

Included Lab Sample IDs: 2200340

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	101	P/P	90 - 110
Calcium	101	99.9	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	99.4	98.5	P/P	90 - 110
Potassium	99.6	98.8	P/P	90 - 110
Sodium	103	102	P/P	90 - 110
Zinc	97.0	98.3	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A101486

Included Lab Sample IDs: 2200331, 2200334

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

Reference Method: SM 4500 F-C-2011

Run ID: A101486

Included Lab Sample IDs: 2200331, 2200334

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A101493

Included Lab Sample IDs: 2200331, 2200334

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A101496

Included Lab Sample IDs: 2200340

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.8	98.7	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					2.65	
EPA 200.7 Rev. 4.4	Barium	106	104	107	105		2.35
	Calcium	102	103	99.2			3.37
	Iron	109	114	107	108		5.15
	Magnesium	107	113	105	103		4.62
	Potassium	103	105	101	99.0		3.99
	Sodium	108	110	105	103		2.52
	Zinc	100	99.7	102	101		2.39
EPA 200.8 Rev. 5.4	Aluminum	102	100	102	103		2.14
	Antimony	104	104	105	107		0.621
	Arsenic	104	103	104	105		0.989
	Beryllium	96.5	95.9	98.7	96.8		2.93
	Boron	98.0	102	105	103		2.18
	Cadmium	101	101	103	103		1.37
	Chromium	103	101	100	105		0.409
	Copper	104	103	103	104		0.182
	Lead	99.7	98.4	99.5	101		1.12
	Nickel	104	101	102	103		0.217
	Selenium	103	96.2	99.9	99.1		3.75
	Silver	97.9	97.6	95.7	98.6		1.93
	Thallium	102	103	106	101		1.89
EPA 300.0 Rev. 2.1	Chloride	104	106			3.30	
	Sulfate	103	103	97.4		1.01	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.8	101			0.754
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105					7.63
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.5	99.5			0.0
EPA 365.1 Rev. 2.0	Total-P	109					1.71
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.6	95.4	95.7			0.314
SM 2120 B-2011	Color (true)	96.6				4.83	
SM 2320 B-2011	Total Alkalinity	99.8				1.20	
SM 2540 C-2011	TDS					0.195	
SM 4500 F-C-2011	Fluoride	99.4	98.1	98.8			0.467
SM 5310 B-2011	Organic Carbon	97.4	101	101			0.220

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2200331, 2200334
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2200340
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2200340
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2200331, 2200334
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2200331, 2200334
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2200332, 2200335
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2200332, 2200335
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2200332, 2200335
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2200332, 2200335
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2200333, 2200336
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2200331, 2200334
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2200331, 2200334
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2200340

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2200331, 2200334
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2200331, 2200334
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2200331, 2200334
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2200332, 2200335

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	10/07/2020			10/07/2020 15:48	Yen Ta	2200331, 2200334
EPA 200.7 Rev. 4.4	10/07/2020	10/08/2020 15:20	Elliott D. Healy	10/12/2020 14:19	Betina Topolski	2200340
EPA 200.8 Rev. 5.4	10/07/2020	10/08/2020 15:20	Elliott D. Healy	10/12/2020 17:05	Alexander Thompson	2200340
	10/07/2020	10/08/2020 15:20	Elliott D. Healy	10/13/2020 16:32	Alexander Thompson	2200340
EPA 300.0 Rev. 2.1	10/07/2020			10/14/2020 07:37	Elliott Rodriguez	2200331
	10/07/2020			10/14/2020 07:50	Elliott Rodriguez	2200334
EPA 350.1 Rev. 2.0	10/07/2020			10/10/2020 11:43	Ping Hua	2200332
	10/07/2020			10/10/2020 11:49	Ping Hua	2200335
EPA 351.2 Rev. 2.0	10/07/2020	10/09/2020 12:50	David Boose	10/12/2020 13:04	Virginia P. Brown	2200332
	10/07/2020	10/09/2020 12:50	David Boose	10/12/2020 13:05	Virginia P. Brown	2200335
EPA 353.2 Rev. 2.0	10/07/2020			10/12/2020 09:10	Beverly Y. Sanders	2200332
	10/07/2020			10/12/2020 09:16	Beverly Y. Sanders	2200335
EPA 365.1 Rev. 2.0	10/07/2020	10/09/2020 12:35	Yen Ta	10/12/2020 12:08	Shengyu Wang	2200332
	10/07/2020	10/09/2020 12:35	Yen Ta	10/12/2020 12:09	Shengyu Wang	2200335
EPA 365.1 Rev. 2.0 dissolved	10/07/2020			10/07/2020 15:56	Blanca Fach	2200336
	10/07/2020			10/07/2020 16:00	Blanca Fach	2200333
SM 2120 B-2011	10/07/2020			10/07/2020 16:57	Benjamin T. Nordmann	2200331
	10/07/2020			10/07/2020 17:02	Benjamin T. Nordmann	2200334
SM 2320 B-2011	10/07/2020			10/13/2020 07:17	Lauren Lees	2200331
	10/07/2020			10/13/2020 07:29	Lauren Lees	2200334
SM 2340B	10/07/2020			10/12/2020 14:19	Betina Topolski	2200340
SM 2540 C-2011	10/07/2020			10/08/2020 15:02	Yijie Li	2200331, 2200334
SM 2540 D-2011	10/07/2020			10/08/2020 15:02	Yijie Li	2200331, 2200334
SM 4500 F-C-2011	10/07/2020			10/13/2020 07:17	Lauren Lees	2200331
	10/07/2020			10/13/2020 07:29	Lauren Lees	2200334
SM 5310 B-2011	10/07/2020			10/09/2020 03:04	Madeline Gruver	2200332
	10/07/2020			10/09/2020 03:43	Madeline Gruver	2200335