Chemical Analysis Report

SW-DIST-2020-09-11-02

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

Event Description: **Run 12**
Request ID: **RQ-2020-08-31-01**
Customer: **SW-DIST**
Project ID: **SMP**

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13051 N. Telecom Parkway
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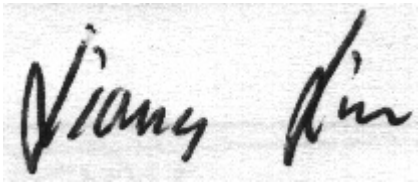
Date Certified: 01-OCT-2020 10:37



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: Reclaimed Mine Cut Lake SE **Collection Date/Time: 09/10/2020 11:30**

Field ID: G3SW0074 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2195687	EPA 180.1 Rev. 2.0	Turbidity	14	A	NTU	P387277	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P387418	
	SM 2120 B-2011	Color (true)	17		PCU	P387287	
	SM 2320 B-2011	Total Alkalinity	59		mg CaCO3/L	P387363	
	SM 2540 C-2011	TDS	89		mg/L	P387784	
	SM 2540 D-2011	TSS	12		mg/L	P387631	
	SM 4500 F-C-2011	Fluoride	1.1		mg F/L	P387365	
2195688	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P387306	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P387477	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387340	
	EPA 365.1 Rev. 2.0	Total-P	0.25		mg P/L	P387806	
	SM 5310 B-2011	Organic Carbon	8.7		mg C/L	P387426	
2195689	EPA 300.0 Rev. 2.1 dissolved	Sulfate	0.23	I	mg SO4/L	P387420	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.077		mg P/L	P387283	

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: Livingston Creek @ Old Avon Park Rd **Collection Date/Time: 09/10/2020 12:40**

Field ID: G4SW0104 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2195681	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P387277	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P387418	
	SM 2120 B-2011	Color (true)	250		PCU	P387286	
	SM 2320 B-2011	Total Alkalinity	12		mg CaCO3/L	P387363	
	SM 2540 C-2011	TDS	92		mg/L	P387784	
	SM 2540 D-2011	TSS	2	I	mg/L	P387631	
	SM 4500 F-C-2011	Fluoride	0.10		mg F/L	P387365	
2195683	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P387306	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P387461	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387340	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P387806	
	SM 5310 B-2011	Organic Carbon	22		mg C/L	P387426	
2195685	EPA 300.0 Rev. 2.1 dissolved	Sulfate	6.5		mg SO4/L	P387420	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P387283	
2195694	EPA 200.7 Rev. 4.4	Barium	6.4		ug/L	P387388	
		Calcium	5.16		mg/L	P387388	
		Iron	210		ug/L	P387388	
		Magnesium	3.79		mg/L	P387388	
		Potassium	6.3		mg/L	P387388	
		Sodium	7.0		mg/L	P387388	
		Zinc	5.0	U	ug/L	P387388	
	EPA 200.8 Rev. 5.4	Aluminum	74		ug/L	P387388	
		Antimony	0.050	U	ug/L	P387388	
		Arsenic	0.31		ug/L	P387388	
		Boron**	33.5		ug/L	P387388	
		Cadmium	0.020	U	ug/L	P387388	
		Chromium	0.40	U	ug/L	P387388	
		Copper	0.40	U	ug/L	P387388	
		Lead	0.20	U	ug/L	P387388	
		Nickel	0.50	U	ug/L	P387388	
		Selenium	0.20	U	ug/L	P387388	
		Silver	0.010	U	ug/L	P387388	
		Thallium	0.10	U	ug/L	P387388	
	SM 2340B	Hardness	28.5		mg/L	P387388	

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: Lake Isabell Center **Collection Date/Time: 09/10/2020 13:10**

Field ID: G4SW0095 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2195682	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P387277	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P387418	
	SM 2120 B-2011	Color (true)	69		PCU	P387286	
	SM 2320 B-2011	Total Alkalinity	11		mg CaCO3/L	P387363	
	SM 2540 C-2011	TDS	90		mg/L	P387784	
	SM 2540 D-2011	TSS	2	I	mg/L	P387631	
	SM 4500 F-C-2011	Fluoride	0.092	I	mg F/L	P387365	
2195684	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P387306	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P387461	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387340	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P387806	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P387426	
2195686	EPA 300.0 Rev. 2.1 dissolved	Sulfate	19		mg SO4/L	P387420	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P387283	
2195695	EPA 200.7 Rev. 4.4	Barium	10.2		ug/L	P387388	
		Calcium	6.55		mg/L	P387388	
		Iron	45	I	ug/L	P387388	
		Magnesium	6.36		mg/L	P387388	
		Potassium	7.7		mg/L	P387388	
		Sodium	5.0		mg/L	P387388	
		Zinc	5.0	U	ug/L	P387388	
	EPA 200.8 Rev. 5.4	Aluminum	24		ug/L	P387388	
		Antimony	0.072	I	ug/L	P387388	
		Arsenic	0.75		ug/L	P387388	
		Boron**	38.0		ug/L	P387388	
		Cadmium	0.020	U	ug/L	P387388	
		Chromium	0.40	U	ug/L	P387388	
		Copper	0.69	I	ug/L	P387388	
		Lead	0.20	U	ug/L	P387388	
		Nickel	0.50	U	ug/L	P387388	
		Selenium	0.20	U	ug/L	P387388	
		Silver	0.010	U	ug/L	P387388	
		Thallium	0.10	U	ug/L	P387388	
	SM 2340B	Hardness	42.6		mg/L	P387388	

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: P387277

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387388

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: P387388

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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: P387418

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P387420

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387306

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: P387461

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387477

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387340

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387806

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387283

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

Reference Method: SM 2120 B-2011
Batch ID: P387286

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P387287

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P387363

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

Reference Method: SM 2540 C-2011
Batch ID: P387784

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P387631

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P387365

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P387426

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: P387388

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	99.6		P	85 - 115
Iron	102		P	85 - 115
Magnesium	99.1		P	85 - 115
Potassium	98.3		P	85 - 115
Sodium	97.8		P	85 - 115
Zinc	98.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387388

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.0		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	96.7		P	85 - 115
Boron	93.3		P	85 - 115
Cadmium	95.9		P	85 - 115
Chromium	95.8		P	85 - 115
Copper	94.9		P	85 - 115
Lead	96.4		P	85 - 115
Nickel	95.1		P	85 - 115
Selenium	94.1		P	85 - 115
Silver	97.0		P	85 - 115
Thallium	98.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387418

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P387420

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387306

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	92.5		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387461

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387477

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387340

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: P387806

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: P387283

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

Reference Method: SM 2120 B-2011
Batch ID: P387286

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	95.4		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P387287

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.3		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P387363

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

Reference Method: SM 4500 F-C-2011
Batch ID: P387365

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P387426

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195695	Barium	98.7		P	80 - 120
2195695	Calcium	98.9		P	80 - 120
2195695	Iron	102		P	80 - 120
2195695	Magnesium	95.9		P	80 - 120
2195695	Potassium	96.0		P	80 - 120
2195695	Sodium	95.6		P	80 - 120
2195695	Zinc	98.1		P	80 - 120
2195751	Barium	102	98.7	P/P	80 - 120
2195751	Calcium	97.3		P	80 - 120
2195751	Iron	103	102	P/P	80 - 120
2195751	Magnesium	97.7		P	80 - 120
2195751	Potassium	95.7		P	80 - 120
2195751	Sodium	96.5		P	80 - 120
2195751	Zinc	102	98.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195695	Aluminum	93.8		P	80 - 120
2195695	Antimony	102		P	80 - 120
2195695	Arsenic	96.2		P	80 - 120
2195695	Boron	93.0		P	80 - 120
2195695	Cadmium	97.0		P	80 - 120
2195695	Chromium	95.6		P	80 - 120
2195695	Copper	94.3		P	80 - 120
2195695	Lead	96.5		P	80 - 120
2195695	Nickel	94.9		P	80 - 120
2195695	Selenium	94.9		P	80 - 120
2195695	Silver	94.7		P	80 - 120
2195695	Thallium	99.8		P	80 - 120
2195751	Aluminum	94.0	95.3	P/P	80 - 120
2195751	Antimony	102	104	P/P	80 - 120
2195751	Arsenic	97.5	98.5	P/P	80 - 120
2195751	Boron	92.5	94.9	P/P	80 - 120
2195751	Cadmium	96.0	96.5	P/P	80 - 120
2195751	Chromium	96.7	97.2	P/P	80 - 120
2195751	Copper	95.4	95.7	P/P	80 - 120
2195751	Lead	96.8	98.3	P/P	80 - 120
2195751	Nickel	94.6	95.2	P/P	80 - 120
2195751	Selenium	96.0	95.2	P/P	80 - 120
2195751	Silver	96.2	97.8	P/P	80 - 120
2195751	Thallium	98.6	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195501	Chloride	93.1		P	90 - 110
2195725	Chloride	96.2		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P387420

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195501	Sulfate	95.1		P	90 - 110
2195725	Sulfate	94.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387306

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195677	Ammonia-N	95.0	96.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387461

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195578	Kjeldahl Nitrogen	92.9	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387477

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195742	Kjeldahl Nitrogen	105	110	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387340

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195684	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387806

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195530	Total-P	103	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387283

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195767	O-Phosphate-P	98.4	98.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P387365

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195676	Fluoride	101	99.9	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P387426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195578	Organic Carbon	98.5	100	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P387277

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195687	Turbidity	5.88	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195751	Barium	3.51	Spike	P	0 - 20
2195751	Calcium	0.465	Spike	P	0 - 20
2195751	Iron	1.25	Spike	P	0 - 20
2195751	Magnesium	1.16	Spike	P	0 - 20
2195751	Potassium	0.310	Spike	P	0 - 20
2195751	Sodium	0.497	Spike	P	0 - 20
2195751	Zinc	4.22	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195751	Aluminum	1.40	Spike	P	0 - 20
2195751	Antimony	1.76	Spike	P	0 - 20
2195751	Arsenic	1.00	Spike	P	0 - 20
2195751	Boron	2.09	Spike	P	0 - 20
2195751	Cadmium	0.532	Spike	P	0 - 20
2195751	Chromium	0.565	Spike	P	0 - 20
2195751	Copper	0.343	Spike	P	0 - 20
2195751	Lead	1.50	Spike	P	0 - 20
2195751	Nickel	0.657	Spike	P	0 - 20
2195751	Selenium	0.929	Spike	P	0 - 20
2195751	Silver	1.71	Spike	P	0 - 20
2195751	Thallium	2.97	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195501	Chloride	0.0871	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P387420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195501	Sulfate	0.114	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387306

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195677	Ammonia-N	1.21	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387461

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195578	Kjeldahl Nitrogen	3.14	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387477

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195742	Kjeldahl Nitrogen	2.76	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387340

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195684	NO2NO3-N	0.995	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387806

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195530	Total-P	2.55	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387283

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195767	O-Phosphate-P	0.303	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P387286

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195661	Color (true)	1.65	Sample	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P387287

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195741	Color (true)	0.583	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P387363

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195676	Total Alkalinity	0.703	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P387784

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195676	TDS	8.61	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P387365

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195676	Fluoride	0.967	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P387426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195578	Organic Carbon	1.51	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: A100939
Included Lab Sample IDs: 2195681, 2195682, 2195687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	101	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A100940
Included Lab Sample IDs: 2195685, 2195686, 2195689

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.5	97.5	P/P	90 - 110
O-Phosphate-P	97.8	97.6	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A100942
Included Lab Sample IDs: 2195681, 2195682, 2195687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.8	99.3	P/P	90 - 115
Color (true)	99.3	98.0	P/P	90 - 115
Color (true)	99.9	100	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A100947
Included Lab Sample IDs: 2195683, 2195684, 2195688

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.6	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A100959
Included Lab Sample IDs: 2195683, 2195684, 2195688

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	103	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A100975
Included Lab Sample IDs: 2195681, 2195682, 2195687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A100975
Included Lab Sample IDs: 2195681, 2195682, 2195687

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100980
Included Lab Sample IDs: 2195681, 2195682, 2195687

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Run ID: A100980
Included Lab Sample IDs: 2195685, 2195686, 2195689

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

Reference Method: SM 5310 B-2011
Run ID: A101004
Included Lab Sample IDs: 2195683, 2195684, 2195688

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101037
Included Lab Sample IDs: 2195694, 2195695

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	96.4	96.5	P/P	95 - 105
Barium	96.5	95.9	P/P	90 - 110
Calcium	98.0	98.9	P/P	90 - 110
Calcium	99.8	98.0	P/P	95 - 105
Iron	101	98.8	P/P	95 - 105
Iron	98.8	99.7	P/P	90 - 110
Magnesium	101	98.0	P/P	95 - 105
Magnesium	98.0	99.2	P/P	90 - 110
Potassium	101	96.8	P/P	95 - 105
Potassium	96.8	98.2	P/P	90 - 110
Sodium	101	96.4	P/P	95 - 105
Sodium	96.4	98.3	P/P	90 - 110
Zinc	96.8	97.1	P/P	95 - 105
Zinc	97.1	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101057
Included Lab Sample IDs: 2195683, 2195684, 2195688

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	103	P/P	90 - 110
Kjeldahl Nitrogen	98.1	97.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101063
Included Lab Sample IDs: 2195694, 2195695

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.2	94.2	P/P	90 - 110
Antimony	104	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101063
Included Lab Sample IDs: 2195694, 2195695

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	94.2	94.5	P/P	90 - 110
Boron	93.6	93.5	P/P	90 - 110
Cadmium	94.2	94.7	P/P	90 - 110
Chromium	93.5	93.4	P/P	90 - 110
Copper	92.2	92.6	P/P	90 - 110
Lead	94.8	95.6	P/P	90 - 110
Nickel	92.1	92.1	P/P	90 - 110
Selenium	94.1	93.7	P/P	90 - 110
Silver	95.6	96.2	P/P	90 - 110
Thallium	94.8	94.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101206
Included Lab Sample IDs: 2195683, 2195688

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101251
Included Lab Sample IDs: 2195684

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

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						5.88	
EPA 200.7 Rev. 4.4	Barium	101	98.7	102	98.7			3.51
	Calcium	99.6	98.9	97.3				0.465
	Iron	102	102	103	102			1.25
	Magnesium	99.1	95.9	97.7				1.16
	Potassium	98.3	96.0	95.7				0.310
	Sodium	97.8	95.6	96.5				0.497
	Zinc	98.8	98.1	102	98.1			4.22
EPA 200.8 Rev. 5.4	Aluminum	95.0	94.0	95.3	93.8			1.40
	Antimony	101	102	104	102			1.76
	Arsenic	96.7	97.5	98.5	96.2			1.00
	Boron	93.3	92.5	94.9	93.0			2.09
	Cadmium	95.9	96.0	96.5	97.0			0.532
	Chromium	95.8	96.7	97.2	95.6			0.565
	Copper	94.9	95.4	95.7	94.3			0.343
	Lead	96.4	96.8	98.3	96.5			1.50
	Nickel	95.1	94.6	95.2	94.9			0.657
	Selenium	94.1	96.0	95.2	94.9			0.929
	Silver	97.0	96.2	97.8	94.7			1.71
	Thallium	98.3	98.6	102	99.8			2.97
EPA 300.0 Rev. 2.1	Chloride	96.3	93.1	96.2			0.0871	
EPA 300.0 Rev. 2.1 dissolved	Sulfate	96.2	95.1	94.8			0.114	
EPA 350.1 Rev. 2.0	Ammonia-N	92.5	95.0	96.3				1.21
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	92.9	96.4				3.14
	Kjeldahl Nitrogen	101	105	110				2.76
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	100				0.995
EPA 365.1 Rev. 2.0	Total-P	107	103	108				2.55
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	98.4	98.8				0.303
SM 2120 B-2011	Color (true)	95.4					1.65	
	Color (true)	96.3					0.583	
SM 2320 B-2011	Total Alkalinity	101					0.703	
SM 2540 C-2011	TDS						8.61	
SM 4500 F-C-2011	Fluoride	102	101	99.9				0.967
SM 5310 B-2011	Organic Carbon	99.8	98.5	100				1.51

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2195681, 2195682, 2195687
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2195694, 2195695
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2195694, 2195695
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2195681, 2195682, 2195687
EPA 300.0 Rev. 2.1 dissolved	Sulfate, dissolved, in filtered, aqueous matrices	2195685, 2195686, 2195689
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2195683, 2195684, 2195688
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2195683, 2195684, 2195688
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2195683, 2195684, 2195688
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2195683, 2195684, 2195688
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2195685, 2195686, 2195689
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2195681, 2195682, 2195687
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2195681, 2195682, 2195687

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2195694, 2195695
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2195681, 2195682, 2195687
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2195681, 2195682, 2195687
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2195681, 2195682, 2195687
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2195683, 2195684, 2195688

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	09/11/2020			09/11/2020 14:50	Yen Ta	2195681, 2195682, 2195687
EPA 200.7 Rev. 4.4	09/11/2020	09/15/2020 15:15	Elliott D. Healy	09/16/2020 16:15	Betina Topolski	2195694
	09/11/2020	09/15/2020 15:15	Elliott D. Healy	09/16/2020 16:50	Betina Topolski	2195695
EPA 200.8 Rev. 5.4	09/11/2020	09/15/2020 15:15	Elliott D. Healy	09/17/2020 23:37	Alexander Thompson	2195694
	09/11/2020	09/15/2020 15:15	Elliott D. Healy	09/18/2020 00:31	Alexander Thompson	2195695
EPA 300.0 Rev. 2.1	09/11/2020			09/16/2020 01:38	Lipi Saha	2195681
	09/11/2020			09/16/2020 01:51	Lipi Saha	2195682
	09/11/2020			09/16/2020 02:04	Lipi Saha	2195687
EPA 300.0 Rev. 2.1 dissolved	09/11/2020			09/16/2020 02:44	Lipi Saha	2195685
	09/11/2020			09/16/2020 02:57	Lipi Saha	2195686
	09/11/2020			09/16/2020 03:10	Lipi Saha	2195689
EPA 350.1 Rev. 2.0	09/11/2020			09/13/2020 14:05	Ping Hua	2195683
	09/11/2020			09/13/2020 14:07	Ping Hua	2195684
	09/11/2020			09/13/2020 14:08	Ping Hua	2195688
EPA 351.2 Rev. 2.0	09/11/2020	09/16/2020 12:40	David Boose	09/17/2020 11:59	Virginia P. Brown	2195683
	09/11/2020	09/16/2020 12:40	David Boose	09/17/2020 12:00	Virginia P. Brown	2195684
	09/11/2020	09/16/2020 12:40	David Boose	09/17/2020 12:56	Virginia P. Brown	2195688
EPA 353.2 Rev. 2.0	09/11/2020			09/14/2020 10:53	Beverly Y. Sanders	2195684
	09/11/2020			09/14/2020 10:59	Beverly Y. Sanders	2195683
	09/11/2020			09/14/2020 11:00	Beverly Y. Sanders	2195688
EPA 365.1 Rev. 2.0	09/11/2020	09/24/2020 11:57	Yen Ta	09/25/2020 15:42	Benjamin T. Nordmann	2195683
	09/11/2020	09/24/2020 11:57	Yen Ta	09/25/2020 15:44	Benjamin T. Nordmann	2195688
	09/11/2020	09/24/2020 11:57	Yen Ta	09/29/2020 11:28	Lipi Saha	2195684
EPA 365.1 Rev. 2.0 dissolved	09/11/2020			09/11/2020 15:56	Samantha Davila	2195685
	09/11/2020			09/11/2020 15:57	Samantha Davila	2195686
	09/11/2020			09/11/2020 16:34	Samantha Davila	2195689
SM 2120 B-2011	09/11/2020			09/11/2020 15:58	Madeline Gruver	2195682
	09/11/2020			09/11/2020 16:02	Madeline Gruver	2195687
	09/11/2020			09/11/2020 16:32	Madeline Gruver	2195681
SM 2320 B-2011	09/11/2020			09/14/2020 21:33	Dale L. Simmons	2195681
	09/11/2020			09/14/2020 21:46	Dale L. Simmons	2195682
	09/11/2020			09/14/2020 21:59	Dale L. Simmons	2195687
SM 2340B	09/11/2020			09/16/2020 16:15	Betina Topolski	2195694
	09/11/2020			09/16/2020 16:50	Betina Topolski	2195695
SM 2540 C-2011	09/11/2020			09/16/2020 15:09	Yijie Li	2195681, 2195682, 2195687
SM 2540 D-2011	09/11/2020			09/16/2020 15:09	Yijie Li	2195681, 2195682, 2195687
SM 4500 F-C-2011	09/11/2020			09/14/2020 21:33	Dale L. Simmons	2195681
	09/11/2020			09/14/2020 21:46	Dale L. Simmons	2195682
	09/11/2020			09/14/2020 21:59	Dale L. Simmons	2195687
SM 5310 B-2011	09/11/2020			09/15/2020 22:31	David Boose	2195683

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	09/11/2020			09/15/2020 22:43	David Boose	2195684
	09/11/2020			09/15/2020 22:55	David Boose	2195688