Chemical Analysis Report

SW-DIST-2020-10-09-01

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

Event Description: **SMP RUN 6**
Request ID: **RQ-2020-09-28-05**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
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13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
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Date Certified: 30-OCT-2020 14:18

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: Indian Creek @ Fruitville Rd. **Collection Date/Time: 10/08/2020 11:20**

Field ID: G3SD0057 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2200972	EPA 180.1 Rev. 2.0	Turbidity	5.3		NTU	P388483	
	EPA 300.0 Rev. 2.1	Chloride	18	A	mg Cl/L	P388736	
	SM 2120 B-2011	Color (true)	320		PCU	P388490	
	SM 2320 B-2011	Total Alkalinity	40		mg CaCO3/L	P388771	
	SM 2540 C-2011	TDS	175		mg/L	P388919	
	SM 2540 D-2011	TSS	7	I	mg/L	P388923	
	SM 4500 F-C-2011	Fluoride	0.29		mg F/L	P388775	
2200974	EPA 350.1 Rev. 2.0	Ammonia-N	0.071		mg N/L	P388505	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P388581	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.028		mg N/L	P388558	
	EPA 365.1 Rev. 2.0	Total-P	0.87		mg P/L	P388531	
	SM 5310 B-2011	Organic Carbon	33		mg C/L	P388724	
2200976	EPA 300.0 Rev. 2.1 dissolved	Sulfate	23		mg SO4/L	P389334	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.63		mg P/L	P388486	
2200991	EPA 200.7 Rev. 4.4	Barium	4.4		ug/L	P388584	
		Calcium	17.2		mg/L	P388584	
		Iron	1.69E+03		ug/L	P388584	
		Magnesium	7.21		mg/L	P388584	
		Potassium	2.0		mg/L	P388584	
		Sodium	9.3		mg/L	P388584	
		Zinc	5.0	U	ug/L	P388584	
	EPA 200.8 Rev. 5.4	Aluminum	292		ug/L	P388584	
		Antimony	0.064	I	ug/L	P388584	
		Arsenic	3.00		ug/L	P388584	
		Boron**	26.3		ug/L	P388584	
		Cadmium	0.020	U	ug/L	P388584	
		Chromium	1.2	I	ug/L	P388584	
		Copper	1.09		ug/L	P388584	
		Lead	0.22	I	ug/L	P388584	
		Nickel	0.81	I	ug/L	P388584	
		Selenium	0.20	U	ug/L	P388584	
		Silver	0.010	U	ug/L	P388584	
		Thallium	0.10	U	ug/L	P388584	
	SM 2340B	Hardness	72.6		mg/L	P388584	

Ref. Method and Comment:
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: Field Blank **Collection Date/Time: 10/08/2020 09:00**

Field ID: FB100820 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2200973	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P388483	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P388736	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P388490	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P388771	
	SM 2540 C-2011	TDS	15	U	mg/L	P388918	
	SM 2540 D-2011	TSS	2	U	mg/L	P388922	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P388775	
2200975	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P388505	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P388581	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388558	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P388531	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P388724	
2200977	EPA 300.0 Rev. 2.1 dissolved	Sulfate	0.20	U	mg SO4/L	P389334	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P388486	
2200992	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P388584	
		Calcium	0.075	U	mg/L	P388584	
		Iron	30	U	ug/L	P388584	
		Magnesium	0.040	U	mg/L	P388584	
		Potassium	0.30	U	mg/L	P388584	
		Sodium	0.50	U	mg/L	P388584	
		Zinc	5.0	U	ug/L	P388584	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P388584	
		Antimony	0.050	U	ug/L	P388584	
		Arsenic	0.050	U	ug/L	P388584	
		Boron**	2.0	U	ug/L	P388584	
		Cadmium	0.020	U	ug/L	P388584	
		Chromium	0.40	U	ug/L	P388584	
		Copper	0.40	U	ug/L	P388584	
		Lead	0.20	U	ug/L	P388584	
		Nickel	0.50	U	ug/L	P388584	
		Selenium	0.20	U	ug/L	P388584	
		Silver	0.010	U	ug/L	P388584	
		Thallium	0.10	U	ug/L	P388584	
	SM 2340B	Hardness	0.35	U	mg/L	P388584	

Ref. Method and Comment:
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: P388483

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388584

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: P388584

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: P388736

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P389334

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388505

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: P388581

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388558

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388531

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388486

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

Reference Method: SM 2120 B-2011
Batch ID: P388490

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P388771

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

Reference Method: SM 2540 C-2011
Batch ID: P388918

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P388919

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P388922

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P388923

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P388775

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P388724

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: P388584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	103		P	85 - 115
Iron	104		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	100		P	85 - 115
Sodium	103		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	106		P	85 - 115
Antimony	96.6		P	85 - 115
Arsenic	98.1		P	85 - 115
Boron	92.4		P	85 - 115
Cadmium	93.4		P	85 - 115
Chromium	99.3		P	85 - 115
Copper	105		P	85 - 115
Lead	93.7		P	85 - 115
Nickel	105		P	85 - 115
Selenium	97.3		P	85 - 115
Silver	105		P	85 - 115
Thallium	109		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388736

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P389334

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388505

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388581

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388558

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: P388531

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: P388486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.7		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P388490

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

Reference Method: SM 2320 B-2011
Batch ID: P388771

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P388775

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.8		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P388724

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388584

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200690	Barium	103	100	P/P	80 - 120
2200690	Calcium	91.8		P	80 - 120
2200690	Iron	108	102	P/P	80 - 120
2200690	Magnesium	109	102	P/P	80 - 120
2200690	Potassium	108	101	P/P	80 - 120
2200690	Sodium	110	102	P/P	80 - 120
2200690	Zinc	99.7	98.6	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388584

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200690	Aluminum	102	104	P/P	80 - 120
2200690	Antimony	97.5	99.3	P/P	80 - 120
2200690	Arsenic	97.2	98.6	P/P	80 - 120
2200690	Boron	92.8	94.1	P/P	80 - 120
2200690	Cadmium	95.7	97.5	P/P	80 - 120
2200690	Chromium	100	101	P/P	80 - 120
2200690	Copper	103	104	P/P	80 - 120
2200690	Lead	91.9	93.9	P/P	80 - 120
2200690	Nickel	105	104	P/P	80 - 120
2200690	Selenium	95.2	94.8	P/P	80 - 120
2200690	Silver	105	105	P/P	80 - 120
2200690	Thallium	108	111	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388736

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200972	Chloride	105		P	90 - 110
2201023	Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P389334

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201329	Sulfate	102		P	90 - 110
2201745	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200979	Ammonia-N	99.7	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200941	NO2NO3-N	100	100	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200830	O-Phosphate-P	98.7	99.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P388775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201022	Fluoride	96.4	97.1	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P388724

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200864	Organic Carbon	108		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200905	Turbidity	4.99	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200690	Barium	2.42	Spike	P	0 - 20
2200690	Calcium	2.90	Spike	P	0 - 20
2200690	Iron	6.13	Spike	P	0 - 20
2200690	Magnesium	5.38	Spike	P	0 - 20
2200690	Potassium	6.84	Spike	P	0 - 20
2200690	Sodium	4.72	Spike	P	0 - 20
2200690	Zinc	0.950	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200690	Aluminum	2.00	Spike	P	0 - 20
2200690	Antimony	1.86	Spike	P	0 - 20
2200690	Arsenic	1.37	Spike	P	0 - 20
2200690	Boron	1.25	Spike	P	0 - 20
2200690	Cadmium	1.89	Spike	P	0 - 20
2200690	Chromium	1.02	Spike	P	0 - 20
2200690	Copper	0.489	Spike	P	0 - 20
2200690	Lead	2.09	Spike	P	0 - 20
2200690	Nickel	1.11	Spike	P	0 - 20
2200690	Selenium	0.398	Spike	P	0 - 20
2200690	Silver	0.116	Spike	P	0 - 20
2200690	Thallium	2.84	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200972	Chloride	1.06	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P389334

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201329	Sulfate	0.0163	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200979	Ammonia-N	0.138	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388581

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200933	Kjeldahl Nitrogen	6.37	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200941	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200974	Total-P	0.695	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200830	O-Phosphate-P	0.908	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P388490

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200940	Color (true)	2.63	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P388771

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201022	Total Alkalinity	2.33	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P388918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200862	TDS	2.59	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P388919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200902	TDS	0.858	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P388775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201022	Fluoride	0.467	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P388724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200864	Organic Carbon	0.255	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: A101455
Included Lab Sample IDs: 2200972, 2200973

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A101457
Included Lab Sample IDs: 2200976, 2200977

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	99.8	P/P	90 - 110
O-Phosphate-P	99.8	100	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A101458
Included Lab Sample IDs: 2200972, 2200973

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	104	P/P	90 - 115
Color (true)	103	101	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A101462
Included Lab Sample IDs: 2200974, 2200975

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A101481
Included Lab Sample IDs: 2200974, 2200975

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A101493
Included Lab Sample IDs: 2200972, 2200973

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101510
Included Lab Sample IDs: 2200974, 2200975

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101527
Included Lab Sample IDs: 2200974

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101527
Included Lab Sample IDs: 2200974

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	107	105	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101528
Included Lab Sample IDs: 2200991, 2200992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	99.8	P/P	90 - 110
Barium	99.5	100	P/P	90 - 110
Calcium	100	102	P/P	90 - 110
Calcium	102	99.0	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Iron	102	100	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	101	98.8	P/P	90 - 110
Potassium	99.8	101	P/P	90 - 110
Sodium	101	99.1	P/P	90 - 110
Sodium	98.9	101	P/P	90 - 110
Zinc	102	103	P/P	90 - 110
Zinc	103	101	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A101541
Included Lab Sample IDs: 2200974, 2200975

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

Reference Method: SM 2320 B-2011
Run ID: A101554
Included Lab Sample IDs: 2200972, 2200973

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	99.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A101554
Included Lab Sample IDs: 2200972, 2200973

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	95.8	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101559
Included Lab Sample IDs: 2200975

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101573
Included Lab Sample IDs: 2200991, 2200992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	93.8	93.3	P/P	90 - 110
Antimony	95.2	93.8	P/P	90 - 110
Arsenic	92.7	92.0	P/P	90 - 110
Arsenic	95.0	92.7	P/P	90 - 110
Boron	91.6	91.6	P/P	90 - 110
Boron	91.6	94.6	P/P	90 - 110
Cadmium	92.0	91.9	P/P	90 - 110
Cadmium	93.1	92.0	P/P	90 - 110
Chromium	94.4	94.1	P/P	90 - 110
Chromium	95.0	94.4	P/P	90 - 110
Lead	91.2	91.5	P/P	90 - 110
Lead	92.6	91.2	P/P	90 - 110
Selenium	90.4	91.0	P/P	90 - 110
Selenium	92.4	90.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101576
Included Lab Sample IDs: 2200991, 2200992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.6	97.8	P/P	90 - 110
Aluminum	98.3	96.6	P/P	90 - 110
Copper	97.4	96.6	P/P	90 - 110
Copper	98.2	97.4	P/P	90 - 110
Nickel	97.5	96.6	P/P	90 - 110
Nickel	98.2	97.5	P/P	90 - 110
Silver	104	103	P/P	90 - 110
Silver	105	104	P/P	90 - 110
Thallium	97.9	96.8	P/P	90 - 110
Thallium	98.2	97.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Run ID: A101798
Included Lab Sample IDs: 2200976, 2200977

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	102	102	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					4.99	
EPA 200.7 Rev. 4.4	Barium	102	103	100			2.42
	Calcium	103	91.8				2.90
	Iron	104	108	102			6.13
	Magnesium	104	109	102			5.38
	Potassium	100	108	101			6.84
	Sodium	103	110	102			4.72
	Zinc	101	99.7	98.6			0.950
EPA 200.8 Rev. 5.4	Aluminum	106	102	104			2.00
	Antimony	96.6	97.5	99.3			1.86
	Arsenic	98.1	97.2	98.6			1.37
	Boron	92.4	92.8	94.1			1.25
	Cadmium	93.4	95.7	97.5			1.89
	Chromium	99.3	100	101			1.02
	Copper	105	103	104			0.489
	Lead	93.7	91.9	93.9			2.09
	Nickel	105	105	104			1.11
	Selenium	97.3	95.2	94.8			0.398
	Silver	105	105	105			0.116
	Thallium	109	108	111			2.84
EPA 300.0 Rev. 2.1	Chloride	103	105	104		1.06	
EPA 300.0 Rev. 2.1 dissolved	Sulfate	99.9	102	102		0.0163	
EPA 350.1 Rev. 2.0	Ammonia-N	98.9	99.7	99.5			0.138
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109					6.37
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	100			0.499
EPA 365.1 Rev. 2.0	Total-P	109					0.695
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	98.7	99.6			0.908
SM 2120 B-2011	Color (true)	101				2.63	
SM 2320 B-2011	Total Alkalinity	102				2.33	
SM 2540 C-2011	TDS					2.59	
	TDS					0.858	
SM 4500 F-C-2011	Fluoride	94.8	96.4	97.1			0.467
SM 5310 B-2011	Organic Carbon	98.6	108				0.255

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2200972, 2200973
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2200991, 2200992
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2200991, 2200992
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2200972, 2200973
EPA 300.0 Rev. 2.1 dissolved	Sulfate, dissolved, in filtered, aqueous matrices	2200976, 2200977
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2200974, 2200975
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2200974, 2200975
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2200974, 2200975
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2200974, 2200975
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2200976, 2200977
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2200972, 2200973
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2200972, 2200973
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2200991, 2200992

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2200972, 2200973
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2200972, 2200973
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2200972, 2200973
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2200974, 2200975

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	10/09/2020			10/09/2020 15:27	Yen Ta	2200972, 2200973
EPA 200.7 Rev. 4.4	10/09/2020	10/13/2020 13:50	Elliott D. Healy	10/14/2020 16:38	Betina Topolski	2200992
	10/09/2020	10/13/2020 13:50	Elliott D. Healy	10/14/2020 18:26	Betina Topolski	2200991
EPA 200.8 Rev. 5.4	10/09/2020	10/13/2020 13:50	Elliott D. Healy	10/16/2020 17:00	Alexander Thompson	2200992
	10/09/2020	10/13/2020 13:50	Elliott D. Healy	10/16/2020 18:31	Alexander Thompson	2200991
	10/09/2020	10/13/2020 13:50	Elliott D. Healy	10/18/2020 14:22	Alexander Thompson	2200992
	10/09/2020	10/13/2020 13:50	Elliott D. Healy	10/18/2020 15:24	Alexander Thompson	2200991
EPA 300.0 Rev. 2.1	10/09/2020			10/15/2020 01:56	Lipi Saha	2200972
	10/09/2020			10/15/2020 03:14	Lipi Saha	2200973
EPA 300.0 Rev. 2.1 dissolved	10/09/2020			10/26/2020 23:19	Lipi Saha	2200976
	10/09/2020			10/26/2020 23:32	Lipi Saha	2200977
EPA 350.1 Rev. 2.0	10/09/2020			10/11/2020 12:22	Ping Hua	2200974
	10/09/2020			10/11/2020 12:25	Ping Hua	2200975
EPA 351.2 Rev. 2.0	10/09/2020	10/13/2020 13:23	David Boose	10/14/2020 10:34	Elliott Rodriguez	2200974
	10/09/2020	10/13/2020 13:23	David Boose	10/14/2020 10:35	Elliott Rodriguez	2200975
EPA 353.2 Rev. 2.0	10/09/2020			10/13/2020 09:26	Beverly Y. Sanders	2200974
	10/09/2020			10/13/2020 09:27	Beverly Y. Sanders	2200975
EPA 365.1 Rev. 2.0	10/09/2020	10/12/2020 12:20	Yen Ta	10/13/2020 14:14	Lipi Saha	2200974
	10/09/2020	10/12/2020 12:20	Yen Ta	10/16/2020 11:22	Shengyu Wang	2200975
EPA 365.1 Rev. 2.0 dissolved	10/09/2020			10/09/2020 16:21	Blanca Fach	2200977
	10/09/2020			10/09/2020 16:40	Blanca Fach	2200976
SM 2120 B-2011	10/09/2020			10/09/2020 17:05	Benjamin T. Nordmann	2200973
	10/09/2020			10/09/2020 17:36	Benjamin T. Nordmann	2200972
SM 2320 B-2011	10/09/2020			10/15/2020 23:04	Lauren Lees	2200972
	10/09/2020			10/15/2020 23:13	Lauren Lees	2200973
SM 2340B	10/09/2020			10/14/2020 16:38	Betina Topolski	2200992
	10/09/2020			10/14/2020 18:26	Betina Topolski	2200991
SM 2540 C-2011	10/09/2020			10/13/2020 15:11	Yijie Li	2200972, 2200973
SM 2540 D-2011	10/09/2020			10/13/2020 15:11	Yijie Li	2200972, 2200973
SM 4500 F-C-2011	10/09/2020			10/15/2020 23:04	Lauren Lees	2200972
	10/09/2020			10/15/2020 23:13	Lauren Lees	2200973
SM 5310 B-2011	10/09/2020			10/14/2020 23:02	Madeline Gruver	2200974
	10/09/2020			10/14/2020 23:14	Madeline Gruver	2200975