Chemical Analysis Report

NW-DIST-2020-11-17-01

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

Event Description: **Defuniak Run**
Request ID: **RQ-2020-11-09-28**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 07-DEC-2020 15:44

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: FB_11162020 **Collection Date/Time: 11/16/2020 12:20**

Field ID: FB_11162020 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2208073	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P390183	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P390445	
		Sulfate	0.20	U	mg SO4/L	P390448	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P390188	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P390265	
	SM 2540 C-2011	TDS	15	U	mg/L	P390461	
	SM 2540 D-2011	TSS	2	U	mg/L	P390453	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P390400	
2208074	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P390352	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P390337	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P390415	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P390315	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P390368	
2208075	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P390190	
2208082	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P390167	
		Calcium	0.075	U	mg/L	P390167	
		Iron	30	U	ug/L	P390167	
		Magnesium	0.040	U	mg/L	P390167	
		Potassium	0.30	U	mg/L	P390167	
		Sodium	0.50	U	mg/L	P390167	
		Zinc	5.0	U	ug/L	P390167	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P390167	
		Antimony	0.050	U	ug/L	P390167	
		Arsenic	0.050	U	ug/L	P390167	
		Boron**	2.0	U	ug/L	P390167	
		Cadmium	0.020	U	ug/L	P390167	
		Chromium	0.40	U	ug/L	P390167	
		Copper	0.40	U	ug/L	P390167	
		Lead	0.20	U	ug/L	P390167	
		Nickel	0.50	U	ug/L	P390167	
		Selenium	0.20	U	ug/L	P390167	
		Silver	0.010	U	ug/L	P390167	
		Thallium	0.10	U	ug/L	P390167	
	SM 2340B	Hardness	0.35	U	mg/L	P390167	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference and 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.

Sample Location: Panther Creek Upstream Of Sr280 **Collection Date/Time: 11/16/2020 12:07**

Field ID: G3NW0061 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2208070	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P390183	
	EPA 300.0 Rev. 2.1	Chloride	3.8		mg Cl/L	P390445	
		Sulfate	0.96		mg SO4/L	P390448	
	SM 2120 B-2011	Color (true)	110	A	PCU	P390188	
	SM 2320 B-2011	Total Alkalinity	1.7	I	mg CaCO3/L	P390265	
	SM 2540 C-2011	TDS	32		mg/L	P390462	
	SM 2540 D-2011	TSS	2	U	mg/L	P390454	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P390400	
2208071	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P390352	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33		mg N/L	P390337	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P390415	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P390315	
	SM 5310 B-2011	Organic Carbon	7.0		mg C/L	P390308	
2208072	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P390190	
2208081	EPA 200.7 Rev. 4.4	Barium	12.5		ug/L	P390167	
		Calcium	1.36		mg/L	P390167	
		Iron	1.13E+03		ug/L	P390167	
		Magnesium	0.63		mg/L	P390167	
		Potassium	0.36	I	mg/L	P390167	
		Sodium	2.4		mg/L	P390167	
		Zinc	5.0	U	ug/L	P390167	
	EPA 200.8 Rev. 5.4	Aluminum	325		ug/L	P390167	
		Antimony	0.050	U	ug/L	P390167	
		Arsenic	0.42		ug/L	P390167	
		Boron**	8.2		ug/L	P390167	
		Cadmium	0.020	I	ug/L	P390167	
		Chromium	0.50	I	ug/L	P390167	
		Copper	0.40	U	ug/L	P390167	
		Lead	0.41		ug/L	P390167	
		Nickel	0.65	I	ug/L	P390167	
		Selenium	0.20	U	ug/L	P390167	
		Silver	0.010	U	ug/L	P390167	
		Thallium	0.10	U	ug/L	P390167	
	SM 2340B	Hardness	6.0		mg/L	P390167	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference and 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.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P390183

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390167

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: P390167

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: P390445

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390448

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390352

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: P390337

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390415

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390315

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390190

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

Reference Method: SM 2120 B-2011
Batch ID: P390188

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P390265

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

Reference Method: SM 2540 C-2011
Batch ID: P390461

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P390462

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P390453

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P390454

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P390400

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P390308

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-2011
Batch ID: P390368

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: P390167

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	98.9		P	85 - 115
Calcium	104		P	85 - 115
Iron	103		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	96.7		P	85 - 115
Sodium	99.9		P	85 - 115
Zinc	97.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390167

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.3		P	85 - 115
Antimony	95.5		P	85 - 115
Arsenic	98.2		P	85 - 115
Boron	95.4		P	85 - 115
Cadmium	96.6		P	85 - 115
Chromium	94.1		P	85 - 115
Copper	95.5		P	85 - 115
Lead	98.7		P	85 - 115
Nickel	96.2		P	85 - 115
Selenium	97.7		P	85 - 115
Silver	103		P	85 - 115
Thallium	96.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390445

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390448

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390352

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390337

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390415

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: P390315

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390190

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

Reference Method: SM 2120 B-2011
Batch ID: P390188

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P390265

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P390400

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.9		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P390308

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	103		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P390368

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390167

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2207939	Barium	97.1		P	80 - 120
2207939	Calcium	114		P	80 - 120
2207939	Iron	104		P	80 - 120
2207939	Magnesium	103		P	80 - 120
2207939	Potassium	104		P	80 - 120
2207939	Sodium	105		P	80 - 120
2207939	Zinc	95.8		P	80 - 120
2207958	Barium	102	96.4	P/P	80 - 120
2207958	Calcium	110	102	P/P	80 - 120
2207958	Iron	109	104	P/P	80 - 120
2207958	Magnesium	106	100	P/P	80 - 120
2207958	Potassium	99.7	95.1	P/P	80 - 120
2207958	Sodium	97.4		P	80 - 120
2207958	Zinc	102	96.0	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390167

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2207939	Aluminum	95.3		P	80 - 120
2207939	Antimony	98.3		P	80 - 120
2207939	Arsenic	101		P	80 - 120
2207939	Boron	97.6		P	80 - 120
2207939	Cadmium	99.8		P	80 - 120
2207939	Chromium	97.8		P	80 - 120
2207939	Copper	96.8		P	80 - 120
2207939	Lead	101		P	80 - 120
2207939	Nickel	98.1		P	80 - 120
2207939	Selenium	97.3		P	80 - 120
2207939	Silver	104		P	80 - 120
2207939	Thallium	103		P	80 - 120
2207958	Aluminum	95.8	94.8	P/P	80 - 120
2207958	Antimony	98.4	98.1	P/P	80 - 120
2207958	Arsenic	99.4	100	P/P	80 - 120
2207958	Boron	97.3	93.6	P/P	80 - 120
2207958	Cadmium	97.1	97.1	P/P	80 - 120
2207958	Chromium	96.6	95.8	P/P	80 - 120
2207958	Copper	106	107	P/P	80 - 120
2207958	Lead	100	101	P/P	80 - 120
2207958	Nickel	98.7	98.5	P/P	80 - 120
2207958	Selenium	96.1	96.1	P/P	80 - 120
2207958	Silver	101	102	P/P	80 - 120
2207958	Thallium	99.1	99.9	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208006	Chloride	102		P	90 - 110
2208246	Chloride	102		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208246	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390352

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208014	Ammonia-N	99.4	96.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208071	Kjeldahl Nitrogen	98.9	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390415

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208071	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390315

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208071	Total-P	106	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390190

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2207910	O-Phosphate-P	97.9	98.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P390400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208929	Fluoride	98.5	98.5	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P390308

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208137	Organic Carbon	102	103	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P390368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2208224	Organic Carbon	103	103	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P390183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208016	Turbidity	5.41	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207958	Barium	5.50	Spike	P	0 - 20
2207958	Calcium	4.40	Spike	P	0 - 20
2207958	Iron	3.92	Spike	P	0 - 20
2207958	Magnesium	3.58	Spike	P	0 - 20
2207958	Potassium	3.24	Spike	P	0 - 20
2207958	Sodium	2.94	Spike	P	0 - 20
2207958	Zinc	5.68	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207958	Aluminum	0.971	Spike	P	0 - 20
2207958	Antimony	0.266	Spike	P	0 - 20
2207958	Arsenic	0.691	Spike	P	0 - 20
2207958	Boron	2.68	Spike	P	0 - 20
2207958	Cadmium	0.0461	Spike	P	0 - 20
2207958	Chromium	0.823	Spike	P	0 - 20
2207958	Copper	1.14	Spike	P	0 - 20
2207958	Lead	0.284	Spike	P	0 - 20
2207958	Nickel	0.232	Spike	P	0 - 20
2207958	Selenium	0.00414	Spike	P	0 - 20
2207958	Silver	0.538	Spike	P	0 - 20
2207958	Thallium	0.859	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208006	Chloride	0.158	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390352

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208014	Ammonia-N	2.13	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208071	Kjeldahl Nitrogen	5.28	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208071	NO2NO3-N	0.995	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208071	Total-P	1.69	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390190

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207910	O-Phosphate-P	0.191	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P390188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208070	Color (true)	1.09	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P390265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208099	Total Alkalinity	0.919	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P390461

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2207943	TDS	2.00	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
Batch ID: P390462

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208099	TDS	0.374	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P390400

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208929	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P390308

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208137	Organic Carbon	0.385	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P390368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2208224	Organic Carbon	0.154	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: A102180
Included Lab Sample IDs: 2208070, 2208073

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

Reference Method: SM 2120 B-2011
Run ID: A102181
Included Lab Sample IDs: 2208070, 2208073

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A102182
Included Lab Sample IDs: 2208072, 2208075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A102200
Included Lab Sample IDs: 2208081, 2208082

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	102	P/P	90 - 110
Barium	99.4	99.2	P/P	90 - 110
Calcium	102	101	P/P	90 - 110
Calcium	99.1	100	P/P	90 - 110
Iron	101	99.5	P/P	90 - 110
Iron	99.5	98.5	P/P	90 - 110
Magnesium	97.9	97.5	P/P	90 - 110
Magnesium	98.3	96.9	P/P	90 - 110
Potassium	97.7	97.1	P/P	90 - 110
Potassium	99.0	96.3	P/P	90 - 110
Sodium	98.2	99.2	P/P	90 - 110
Sodium	98.5	96.9	P/P	90 - 110
Zinc	100	100	P/P	90 - 110
Zinc	105	105	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A102207
Included Lab Sample IDs: 2208070, 2208073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.6	102	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A102227
Included Lab Sample IDs: 2208071

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A102243
Included Lab Sample IDs: 2208071, 2208074

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

Reference Method: SM 5310 B-2011
Run ID: A102251
Included Lab Sample IDs: 2208074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.4	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A102264
Included Lab Sample IDs: 2208071, 2208074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.0	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A102267
Included Lab Sample IDs: 2208071, 2208074

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

Reference Method: SM 4500 F-C-2011
Run ID: A102272
Included Lab Sample IDs: 2208070, 2208073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.0	96.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A102282
Included Lab Sample IDs: 2208071, 2208074

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A102292
Included Lab Sample IDs: 2208081, 2208082

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.3	98.2	P/P	90 - 110
Aluminum	99.1	99.7	P/P	90 - 110
Antimony	93.5	95.3	P/P	90 - 110
Antimony	95.0	93.8	P/P	90 - 110
Arsenic	99.2	99.5	P/P	90 - 110
Arsenic	99.8	98.0	P/P	90 - 110
Boron	95.6	101	P/P	90 - 110
Boron	97.4	99.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A102292
Included Lab Sample IDs: 2208081, 2208082

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	97.9	98.7	P/P	90 - 110
Cadmium	98.8	98.1	P/P	90 - 110
Chromium	97.1	97.7	P/P	90 - 110
Chromium	97.7	97.0	P/P	90 - 110
Copper	96.6	96.9	P/P	90 - 110
Copper	97.9	97.3	P/P	90 - 110
Lead	100	101	P/P	90 - 110
Lead	102	101	P/P	90 - 110
Nickel	98.0	98.1	P/P	90 - 110
Nickel	99.0	98.0	P/P	90 - 110
Selenium	97.1	96.9	P/P	90 - 110
Selenium	98.6	96.8	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Silver	102	101	P/P	90 - 110
Thallium	100	100	P/P	90 - 110
Thallium	103	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A102298
Included Lab Sample IDs: 2208070, 2208073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.6	99.9	P/P	90 - 110
Sulfate	99.7	101	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						5.41	
EPA 200.7 Rev. 4.4	Barium	98.9	97.1	102	96.4			5.50
	Calcium	104	114	110	102			4.40
	Iron	103	104	109	104			3.92
	Magnesium	101	103	106	100			3.58
	Potassium	96.7	104	99.7	95.1			3.24
	Sodium	99.9	105	97.4				2.94
	Zinc	97.6	95.8	102	96.0			5.68
EPA 200.8 Rev. 5.4	Aluminum	95.3	95.3	95.8	94.8			0.971
	Antimony	95.5	98.3	98.4	98.1			0.266
	Arsenic	98.2	101	99.4	100			0.691
	Boron	95.4	97.6	97.3	93.6			2.68
	Cadmium	96.6	99.8	97.1	97.1			0.0461
	Chromium	94.1	97.8	96.6	95.8			0.823
	Copper	95.5	96.8	106	107			1.14
	Lead	98.7	101	100	101			0.284
	Nickel	96.2	98.1	98.7	98.5			0.232
	Selenium	97.7	97.3	96.1	96.1			0.0041
	Silver	103	104	101	102			0.538
	Thallium	96.4	103	99.1	99.9			0.859
EPA 300.0 Rev. 2.1	Chloride	102	102	102			0.158	
	Sulfate	102	101					
EPA 350.1 Rev. 2.0	Ammonia-N	100	99.4	96.5				2.13
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	98.9	106				5.28
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	100				0.995
EPA 365.1 Rev. 2.0	Total-P	104	106	104				1.69
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.5	97.9	98.1				0.191
SM 2120 B-2011	Color (true)	104					1.09	
SM 2320 B-2011	Total Alkalinity	99.4					0.919	
SM 2540 C-2011	TDS						2.00	
	TDS						0.374	
SM 4500 F-C-2011	Fluoride	95.9	98.5	98.5				0.0
SM 5310 B-2011	Organic Carbon	103	102	103				0.385
	Organic Carbon	102	103	103				0.154

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2208070, 2208073
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2208081, 2208082
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2208081, 2208082
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2208070, 2208073
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2208070, 2208073
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2208071, 2208074
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2208071, 2208074
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2208071, 2208074
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2208071, 2208074
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2208072, 2208075
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2208070, 2208073
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2208070, 2208073

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2208081, 2208082
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2208070, 2208073
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2208070, 2208073
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2208070, 2208073
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2208071, 2208074

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	11/17/2020			11/17/2020 16:56	Yen Ta	2208070, 2208073
EPA 200.7 Rev. 4.4	11/17/2020	11/17/2020 15:35	Elliott D. Healy	11/18/2020 13:25	Betina Topolski	2208082
	11/17/2020	11/17/2020 15:35	Elliott D. Healy	11/18/2020 17:04	Betina Topolski	2208081
EPA 200.8 Rev. 5.4	11/17/2020	11/17/2020 15:35	Elliott D. Healy	11/24/2020 17:31	Alexander Thompson	2208082
	11/17/2020	11/17/2020 15:35	Elliott D. Healy	11/24/2020 21:58	Alexander Thompson	2208081
EPA 300.0 Rev. 2.1	11/17/2020			11/24/2020 07:54	Lipi Saha	2208070
	11/17/2020			11/24/2020 08:08	Lipi Saha	2208073
EPA 350.1 Rev. 2.0	11/17/2020			11/21/2020 12:53	Ping Hua	2208071
	11/17/2020			11/21/2020 13:08	Ping Hua	2208074
EPA 351.2 Rev. 2.0	11/17/2020	11/20/2020 13:20	David Boose	11/23/2020 11:26	Elliott Rodriguez	2208071
	11/17/2020	11/20/2020 13:20	David Boose	11/23/2020 11:31	Elliott Rodriguez	2208074
EPA 353.2 Rev. 2.0	11/17/2020			11/24/2020 10:57	Beverly Y. Sanders	2208071
	11/17/2020			11/24/2020 11:07	Beverly Y. Sanders	2208074
EPA 365.1 Rev. 2.0	11/17/2020	11/20/2020 12:57	Yen Ta	11/23/2020 13:22	Shengyu Wang	2208071
	11/17/2020	11/20/2020 12:57	Yen Ta	11/23/2020 13:23	Shengyu Wang	2208074
EPA 365.1 Rev. 2.0 dissolved	11/17/2020			11/17/2020 16:18	Virginia P. Brown	2208072
	11/17/2020			11/17/2020 16:19	Virginia P. Brown	2208075
SM 2120 B-2011	11/17/2020			11/17/2020 16:46	Benjamin T. Nordmann	2208070
	11/17/2020			11/17/2020 16:47	Benjamin T. Nordmann	2208073
SM 2320 B-2011	11/17/2020			11/19/2020 03:41	Dale L. Simmons	2208070
	11/17/2020			11/19/2020 03:49	Dale L. Simmons	2208073
SM 2340B	11/17/2020			11/18/2020 13:25	Betina Topolski	2208082
	11/17/2020			11/18/2020 17:04	Betina Topolski	2208081
SM 2540 C-2011	11/17/2020			11/19/2020 15:12	Yijie Li	2208070, 2208073
SM 2540 D-2011	11/17/2020			11/19/2020 15:12	Yijie Li	2208070, 2208073
SM 4500 F-C-2011	11/17/2020			11/23/2020 14:54	Dale L. Simmons	2208070
	11/17/2020			11/23/2020 15:00	Dale L. Simmons	2208073
SM 5310 B-2011	11/17/2020			11/19/2020 04:41	Touraj Touran	2208071
	11/17/2020			11/20/2020 20:22	Touraj Touran	2208074