Chemical Analysis Report

SW-DIST-2020-10-07-01

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

Event Description: **Run 14 North Pinellas**
Request ID: **RQ-2020-10-12-01**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Bne Paswater

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: 27-OCT-2020 08:59

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: Stevenson Creek Tidal @ Overlea St. **Collection Date/Time: 10/06/2020 10:55**

Field ID: G5SW0164 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2200163	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P388349	
	EPA 300.0 Rev. 2.1	Bromide	8.9		mg Br/L	P388434	
	SM 2320 B-2011	Total Alkalinity	120		mg CaCO3/L	P388574	
	SM 2540 D-2011	TSS	2	U	mg/L	P388779	
	SM 4500 F-C-2011	Fluoride	0.39		mg F/L	P388577	
2200165	EPA 350.1 Rev. 2.0	Ammonia-N	0.073		mg N/L	P388499	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P388459	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P388689	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P388380	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P388444	
2200167	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.093		mg P/L	P388370	

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: Moccasin Creek Tidal **Collection Date/Time: 10/06/2020 10:10**

Field ID: G1SW0051 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2200169	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P388349	
	EPA 300.0 Rev. 2.1	Bromide	17		mg Br/L	P388434	
	SM 2320 B-2011	Total Alkalinity	127		mg CaCO3/L	P388940	
	SM 2540 D-2011	TSS	4	I	mg/L	P388780	RPD
	SM 4500 F-C-2011	Fluoride	0.45		mg F/L	P388776	
2200170	EPA 350.1 Rev. 2.0	Ammonia-N	0.071		mg N/L	P388499	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P388459	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.031		mg N/L	P388689	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P388380	
	SM 5310 B-2011	Organic Carbon	16		mg C/L	P388445	
2200171	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P388370	
2200182	EPA 200.7 Rev. 4.4	Chromium	4.7	I	ug/L	P388748	
		Iron	310	I	ug/L	P388748	
		Manganese	62		ug/L	P388748	
		Zinc	15	U	ug/L	P388748	
	EPA 200.8 Rev. 5.4	Aluminum	37	I	ug/L	P388748	
		Antimony	0.20	U	ug/L	P388748	
		Arsenic	2.59		ug/L	P388748	
		Barium	30.2		ug/L	P388748	
		Beryllium	0.040	U	ug/L	P388748	
		Boron**	1.12E+03		ug/L	P388748	
		Cadmium	0.080	U	ug/L	P388748	
		Cobalt	0.11	I	ug/L	P388748	
		Copper	1.6	U	ug/L	P388748	
		Lead	0.80	U	ug/L	P388748	
		Manganese	64.9		ug/L	P388748	
		Molybdenum	3.0		ug/L	P388748	
		Nickel	2.0	U	ug/L	P388748	
		Selenium	0.80	U	ug/L	P388748	
		Silver	0.040	U	ug/L	P388748	
		Thallium	0.40	U	ug/L	P388748	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable because of high analyte concentration in the QC sample.

Sample Location: Curlew Creek Tidal @ Pirates Cove **Collection Date/Time: 10/06/2020 11:55**

Field ID: G5SW0162 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2200164	EPA 180.1 Rev. 2.0	Turbidity	9.8		NTU	P388349	
	EPA 300.0 Rev. 2.1	Bromide	47		mg Br/L	P388434	
	SM 2320 B-2011	Total Alkalinity	125		mg CaCO3/L	P388940	
	SM 2540 D-2011	TSS	12	AJ	mg/L	P388780	RPD
	SM 4500 F-C-2011	Fluoride	0.95		mg F/L	P388776	
2200166	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P388499	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P388459	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.36		mg N/L	P388689	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P388380	
	SM 5310 B-2011	Organic Carbon	7.3		mg C/L	P388445	
2200168	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.035		mg P/L	P388370	

Ref. Method and Comment:
SM 2540 D-2011: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388349

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388748

Component	Result	Code	Units
Chromium	1.0	U	ug/L
Iron	30	U	ug/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388748

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	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: P388434

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388499

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388459

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388689

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388380

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388370

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

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

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

Reference Method: SM 2320 B-2011
Batch ID: P388940

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

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

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P388780

Component	Result	Code	Units
TSS	3	U	mg/L

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

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-2011
Batch ID: P388776

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

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

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

Reference Method: SM 5310 B-2011
Batch ID: P388445

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: P388748

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	99.8		P	85 - 115
Iron	107		P	85 - 115
Manganese	104		P	85 - 115
Zinc	99.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388748

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	99.8		P	85 - 115
Barium	101		P	85 - 115
Beryllium	95.0		P	85 - 115
Boron	104		P	85 - 115
Cadmium	102		P	85 - 115
Cobalt	100		P	85 - 115
Copper	96.6		P	85 - 115
Lead	96.3		P	85 - 115
Manganese	100		P	85 - 115
Molybdenum	99.4		P	85 - 115
Nickel	98.0		P	85 - 115
Selenium	97.0		P	85 - 115
Silver	97.2		P	85 - 115
Thallium	99.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388434

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388499

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388459

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388689

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388380

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388370

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

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

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

Reference Method: SM 2320 B-2011
Batch ID: P388940

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

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

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

Reference Method: SM 4500 F-C-2011
Batch ID: P388776

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	90 - 106

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

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

Reference Method: SM 5310 B-2011
Batch ID: P388445

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.7		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200182	Chromium	94.7	93.7	P/P	70 - 130
2200182	Iron	105	104	P/P	70 - 130
2200182	Manganese	100	98.0	P/P	70 - 130
2200182	Zinc	97.1	96.9	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200182	Aluminum	108	107	P/P	70 - 130
2200182	Antimony	107	107	P/P	70 - 130
2200182	Arsenic	113	114	P/P	70 - 130
2200182	Barium	104	103	P/P	70 - 130
2200182	Beryllium	109	110	P/P	70 - 130
2200182	Cadmium	103	104	P/P	70 - 130
2200182	Cobalt	111	110	P/P	70 - 130
2200182	Copper	112	111	P/P	70 - 130
2200182	Lead	101	100	P/P	70 - 130
2200182	Manganese	102	99.7	P/P	70 - 130
2200182	Molybdenum	112	113	P/P	70 - 130
2200182	Nickel	107	106	P/P	70 - 130
2200182	Selenium	113	113	P/P	70 - 130
2200182	Silver	91.4	90.6	P/P	70 - 130
2200182	Thallium	105	104	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2199550	Bromide	103	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388499

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200166	Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388459

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200283	Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388689

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200165	NO2NO3-N	102	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388380

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200045	Total-P	103	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388370

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200168	O-Phosphate-P	98.3	98.4	P/P	90 - 110

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

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

Reference Method: SM 4500 F-C-2011
Batch ID: P388776

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200169	Fluoride	101	101	P/P	94 - 107

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

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

Reference Method: SM 5310 B-2011
Batch ID: P388445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200166	Organic Carbon	94.1	97.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200113	Turbidity	3.74	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388748

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200182	Chromium	0.978	Spike	P	0 - 20
2200182	Iron	0.817	Spike	P	0 - 20
2200182	Manganese	1.62	Spike	P	0 - 20
2200182	Zinc	0.282	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388748

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200182	Aluminum	0.966	Spike	P	0 - 20
2200182	Antimony	0.0146	Spike	P	0 - 20
2200182	Arsenic	0.994	Spike	P	0 - 20
2200182	Barium	1.44	Spike	P	0 - 20
2200182	Beryllium	0.778	Spike	P	0 - 20
2200182	Boron	0.167	Spike	P	0 - 20
2200182	Cadmium	0.511	Spike	P	0 - 20
2200182	Cobalt	1.27	Spike	P	0 - 20
2200182	Copper	1.03	Spike	P	0 - 20
2200182	Lead	0.884	Spike	P	0 - 20
2200182	Manganese	1.40	Spike	P	0 - 20
2200182	Molybdenum	0.709	Spike	P	0 - 20
2200182	Nickel	0.663	Spike	P	0 - 20
2200182	Selenium	0.222	Spike	P	0 - 20
2200182	Silver	0.906	Spike	P	0 - 20
2200182	Thallium	0.347	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2199550	Bromide	1.69	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200166	Ammonia-N	0.540	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200283	Kjeldahl Nitrogen	0.749	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200165	NO2NO3-N	0.322	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388380

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200045	Total-P	1.65	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200168	O-Phosphate-P	0.0752	Spike	P	0 - 20

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

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

Reference Method: SM 2320 B-2011
Batch ID: P388940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201247	Total Alkalinity	1.94	Sample	P	0 - 8.1

Reference Method: SM 2540 D-2011
Batch ID: P388780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200164	TSS	10.2	Sample	F	0 - 10

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

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

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P388776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200169	Fluoride	0.0	Spike	P	0 - 2.8

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

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200192	Organic Carbon	0.220	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P388445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200166	Organic Carbon	3.11	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A101391
Included Lab Sample IDs: 2200163, 2200164, 2200169

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A101415
Included Lab Sample IDs: 2200163, 2200164, 2200169

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A101426
Included Lab Sample IDs: 2200167, 2200168, 2200171

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.2	P/P	90 - 110
O-Phosphate-P	98.3	98.0	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A101446
Included Lab Sample IDs: 2200165, 2200166, 2200170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	95.6	P/P	90 - 110
Organic Carbon	97.2	97.2	P/P	90 - 110
Organic Carbon	98.6	97.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A101460
Included Lab Sample IDs: 2200165, 2200166, 2200170

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101474
Included Lab Sample IDs: 2200165, 2200166, 2200170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101478
Included Lab Sample IDs: 2200165, 2200166, 2200170

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A101486
Included Lab Sample IDs: 2200163

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

Reference Method: SM 4500 F-C-2011
Run ID: A101486
Included Lab Sample IDs: 2200163

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A101519
Included Lab Sample IDs: 2200165, 2200166, 2200170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A101554
Included Lab Sample IDs: 2200164, 2200169

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	97.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101610
Included Lab Sample IDs: 2200182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	102	P/P	90 - 110
Manganese	100	101	P/P	90 - 110
Zinc	98.4	99.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101625
Included Lab Sample IDs: 2200182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	98.3	96.4	P/P	95 - 105

Reference Method: SM 2320 B-2011
Run ID: A101630
Included Lab Sample IDs: 2200164, 2200169

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101737
Included Lab Sample IDs: 2200182

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101737
Included Lab Sample IDs: 2200182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	99.4	P/P	90 - 110
Antimony	97.7	98.0	P/P	90 - 110
Arsenic	97.5	97.2	P/P	90 - 110
Barium	96.4	96.6	P/P	90 - 110
Beryllium	99.4	97.2	P/P	90 - 110
Boron	105	103	P/P	90 - 110
Cadmium	98.2	97.6	P/P	90 - 110
Cobalt	98.9	101	P/P	90 - 110
Copper	97.2	99.4	P/P	90 - 110
Lead	95.9	95.9	P/P	90 - 110
Manganese	97.7	98.8	P/P	90 - 110
Molybdenum	96.8	96.8	P/P	90 - 110
Nickel	97.5	99.1	P/P	90 - 110
Selenium	97.6	96.3	P/P	90 - 110
Silver	99.0	98.9	P/P	90 - 110
Thallium	93.6	94.0	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					3.74	
EPA 200.7 Rev. 4.4	Chromium	99.8	94.7	93.7			0.978
	Iron	107	105	104			0.817
	Manganese	104	100	98.0			1.62
	Zinc	99.6	97.1	96.9			0.282
EPA 200.8 Rev. 5.4	Aluminum	101	108	107			0.966
	Antimony	102	107	107			0.0146
	Arsenic	99.8	113	114			0.994
	Barium	101	104	103			1.44
	Beryllium	95.0	109	110			0.778
	Boron	104					0.167
	Cadmium	102	103	104			0.511
	Cobalt	100	111	110			1.27
	Copper	96.6	112	111			1.03
	Lead	96.3	101	100			0.884
	Manganese	100	102	99.7			1.40
	Molybdenum	99.4	112	113			0.709
	Nickel	98.0	107	106			0.663
	Selenium	97.0	113	113			0.222
	Silver	97.2	91.4	90.6			0.906
	Thallium	99.7	105	104			0.347
EPA 300.0 Rev. 2.1	Bromide	107	103	101			1.69
EPA 350.1 Rev. 2.0	Ammonia-N	104	103	104			0.540
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	105	104			0.749
EPA 353.2 Rev. 2.0	NO2NO3-N	100	102	101			0.322
EPA 365.1 Rev. 2.0	Total-P	105	103	101			1.65
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	98.3	98.4			0.0752
SM 2320 B-2011	Total Alkalinity	99.8				1.20	
	Total Alkalinity	101				1.94	
SM 2540 D-2011	TSS					10.2	
SM 4500 F-C-2011	Fluoride	99.4	98.1	98.8			0.467
	Fluoride	96.1	101	101			0.0
SM 5310 B-2011	Organic Carbon	97.4	101	101			0.220
	Organic Carbon	96.7	94.1	97.6			3.11

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2200163, 2200164, 2200169
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2200182
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2200182
EPA 300.0 Rev. 2.1	Bromide in aqueous matrices	2200163, 2200164, 2200169
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2200165, 2200166, 2200170
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2200165, 2200166, 2200170
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2200165, 2200166, 2200170
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2200165, 2200166, 2200170
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2200167, 2200168, 2200171
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2200163, 2200164, 2200169
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2200163, 2200164, 2200169
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2200163, 2200164, 2200169

Reference Method Descriptions

Method	Description	Associated Samples
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2200165, 2200166, 2200170

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	10/07/2020			10/07/2020 15:48	Yen Ta	2200163, 2200164, 2200169
EPA 200.7 Rev. 4.4	10/07/2020	10/15/2020 16:40	Elliott D. Healy	10/19/2020 18:30	Betina Topolski	2200182
	10/07/2020	10/15/2020 16:40	Elliott D. Healy	10/20/2020 11:06	Betina Topolski	2200182
EPA 200.8 Rev. 5.4	10/07/2020	10/15/2020 16:40	Elliott D. Healy	10/23/2020 17:12	Alexander Thompson	2200182
EPA 300.0 Rev. 2.1	10/07/2020			10/09/2020 06:32	Lipi Saha	2200163
	10/07/2020			10/09/2020 06:49	Lipi Saha	2200164
	10/07/2020			10/09/2020 07:06	Lipi Saha	2200169
EPA 350.1 Rev. 2.0	10/07/2020			10/10/2020 13:11	Ping Hua	2200166
	10/07/2020			10/10/2020 13:21	Ping Hua	2200165
	10/07/2020			10/10/2020 13:23	Ping Hua	2200170
EPA 351.2 Rev. 2.0	10/07/2020	10/09/2020 12:48	David Boose	10/12/2020 12:28	Virginia P. Brown	2200165
	10/07/2020	10/09/2020 12:48	David Boose	10/12/2020 12:30	Virginia P. Brown	2200166
	10/07/2020	10/09/2020 12:48	David Boose	10/12/2020 12:31	Virginia P. Brown	2200170
EPA 353.2 Rev. 2.0	10/07/2020			10/14/2020 09:40	Beverly Y. Sanders	2200165
	10/07/2020			10/14/2020 09:46	Beverly Y. Sanders	2200166
	10/07/2020			10/14/2020 09:47	Beverly Y. Sanders	2200170
EPA 365.1 Rev. 2.0	10/07/2020	10/08/2020 13:02	Yen Ta	10/12/2020 14:52	Lipi Saha	2200165
	10/07/2020	10/08/2020 13:02	Yen Ta	10/12/2020 14:53	Lipi Saha	2200166
	10/07/2020	10/08/2020 13:02	Yen Ta	10/12/2020 14:54	Lipi Saha	2200170
EPA 365.1 Rev. 2.0 dissolved	10/07/2020			10/07/2020 16:11	Blanca Fach	2200168
	10/07/2020			10/07/2020 16:27	Blanca Fach	2200167
	10/07/2020			10/07/2020 16:28	Blanca Fach	2200171
SM 2320 B-2011	10/07/2020			10/13/2020 10:07	Lauren Lees	2200163
	10/07/2020			10/19/2020 16:12	Samantha Davila	2200164
	10/07/2020			10/19/2020 16:22	Samantha Davila	2200169
SM 2540 D-2011	10/07/2020			10/08/2020 15:02	Yijie Li	2200163, 2200164, 2200169
SM 4500 F-C-2011	10/07/2020			10/13/2020 10:07	Lauren Lees	2200163
	10/07/2020			10/16/2020 06:28	Lauren Lees	2200169
	10/07/2020			10/16/2020 06:40	Lauren Lees	2200164
SM 5310 B-2011	10/07/2020			10/09/2020 01:10	Madeline Gruver	2200165
	10/07/2020			10/09/2020 04:19	Madeline Gruver	2200166
	10/07/2020			10/09/2020 06:11	Madeline Gruver	2200170