Chemical Analysis Report

SE-DIST-2020-03-19-01

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

Event Description: **North Boat + Deploy**
Request ID: **RQ-2020-03-02-56**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 13-APR-2020 15:07

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: Vero IRL near 45th St **Collection Date/Time: 03/18/2020 12:00**

Field ID: G5SE0065 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2167070	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P381002	
	EPA 300.0 Rev. 2.1	Bromide	63		mg Br/L	P381201	
	SM 2320 B-2011	Total Alkalinity	145		mg CaCO3/L	P381413	
	SM 2540 D-2011	TSS	20		mg/L	P381255	
	SM 4500 F-C-2011	Fluoride	1.2		mg F/L	P381452	
2167073	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P381426	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P381380	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381311	
	EPA 365.1 Rev. 2.0	Total-P	0.075		mg P/L	P381312	
	SM 5310 B-2011	Organic Carbon	4.6		mg C/L	P381091	
2167076	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.030		mg P/L	P381027	
2167088	EPA 200.7 Rev. 4.4	Iron	850		ug/L	P380962	
		Manganese	17		ug/L	P380962	
		Zinc	20	U	ug/L	P380962	
	EPA 200.8 Rev. 5.4	Aluminum	740		ug/L	P381636	
		Antimony	0.50	U	ug/L	P380962	
		Arsenic	2.1		ug/L	P380962	
		Cadmium	0.20	U	ug/L	P380962	
		Chromium	1.8	I	ug/L	P380962	
		Copper	2.5	I	ug/L	P380962	
		Lead	2.0	U	ug/L	P380962	
		Nickel	2.0	U	ug/L	P380962	
		Selenium	2.0	U	ug/L	P380962	
		Silver	0.10	U	ug/L	P380962	
		Thallium	1.0	U	ug/L	P380962	

Sample Location: Vero IRL near 45th St **Collection Date/Time: 03/18/2020 12:05**

Field ID: G5SE0065_DUP Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2167071	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P381002	
	EPA 300.0 Rev. 2.1	Bromide	64		mg Br/L	P381201	
	SM 2320 B-2011	Total Alkalinity	145		mg CaCO3/L	P381413	
	SM 2540 D-2011	TSS	21		mg/L	P381255	
	SM 4500 F-C-2011	Fluoride	1.2		mg F/L	P381452	
2167074	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P381234	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P381281	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381390	
	EPA 365.1 Rev. 2.0	Total-P	0.089		mg P/L	P381415	
	SM 5310 B-2011	Organic Carbon	4.6		mg C/L	P381091	
2167077	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.030		mg P/L	P381027	
2167089	EPA 200.7 Rev. 4.4	Iron	950		ug/L	P380962	
		Manganese	16	I	ug/L	P380962	
		Zinc	20	U	ug/L	P380962	
	EPA 200.8 Rev. 5.4	Aluminum	710		ug/L	P381636	
		Antimony	0.50	U	ug/L	P380962	
		Arsenic	2.1		ug/L	P380962	
		Cadmium	0.20	U	ug/L	P380962	
		Chromium	1.6	U	ug/L	P380962	
		Copper	2.1	I	ug/L	P380962	
		Lead	2.0	U	ug/L	P380962	
		Nickel	2.0	U	ug/L	P380962	
		Selenium	2.0	U	ug/L	P380962	
		Silver	0.10	U	ug/L	P380962	
		Thallium	1.0	U	ug/L	P380962	

Sample Location: Vero IRL South of Wabasso Bridge **Collection Date/Time: 03/18/2020 12:55**

Field ID: G5SE0064 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2167072	EPA 180.1 Rev. 2.0	Turbidity	2.3	A	NTU	P381003	
	EPA 300.0 Rev. 2.1	Bromide	64		mg Br/L	P381201	
	SM 2320 B-2011	Total Alkalinity	143		mg CaCO3/L	P381413	
	SM 2540 D-2011	TSS	9	I	mg/L	P381255	
	SM 4500 F-C-2011	Fluoride	1.2		mg F/L	P381452	
2167075	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P381234	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.52		mg N/L	P381281	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381311	
	EPA 365.1 Rev. 2.0	Total-P	0.046		mg P/L	P381355	
	SM 5310 B-2011	Organic Carbon	4.7		mg C/L	P381091	
2167078	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.029		mg P/L	P381027	
2167090	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P380962	
		Manganese	10	I	ug/L	P380962	
		Zinc	20	U	ug/L	P380962	
	EPA 200.8 Rev. 5.4	Aluminum	70	I	ug/L	P380962	
		Antimony	0.50	U	ug/L	P380962	
		Arsenic	1.9	I	ug/L	P380962	
		Cadmium	0.20	U	ug/L	P380962	
		Chromium	1.6	U	ug/L	P380962	
		Copper	1.6	U	ug/L	P380962	
		Lead	2.0	U	ug/L	P380962	
		Nickel	2.0	U	ug/L	P380962	
		Selenium	2.0	U	ug/L	P380962	
		Silver	0.10	U	ug/L	P380962	
		Thallium	1.0	U	ug/L	P380962	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P381002

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P381003

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P380962

Component	Result	Code	Units
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: P380962

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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 200.8 Rev. 5.4
Batch ID: P381636

Component	Result	Code	Units
Aluminum	5.0	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381201

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381234

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381426

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381281

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381380

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381311

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381390

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381312

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381355

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381415

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P381027

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P381413

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

Reference Method: SM 2540 D-2011
Batch ID: P381255

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P381452

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P381091

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: P380962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	98.6		P	85 - 115
Manganese	103		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	97.3		P	85 - 115
Arsenic	99.4		P	85 - 115
Cadmium	106		P	85 - 115
Chromium	101		P	85 - 115
Copper	93.3		P	85 - 115
Lead	103		P	85 - 115
Nickel	98.3		P	85 - 115
Selenium	93.5		P	85 - 115
Silver	98.2		P	85 - 115
Thallium	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P381636

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.2		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381201

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381234

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381426

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381281

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.4		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381380

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381311

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381390

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381312

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381355

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381415

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: P381027

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

Reference Method: SM 2320 B-2011
Batch ID: P381413

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 107

Reference Method: SM 4500 F-C-2011
Batch ID: P381452

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.3		P	92 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P381091

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P380962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2166312	Iron	99.9	101	P/P	70 - 130
2166312	Manganese	105	104	P/P	70 - 130
2166312	Zinc	104	103	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2166312	Aluminum	97.1	98.9	P/P	70 - 130
2166312	Antimony	99.5	105	P/P	70 - 130
2166312	Arsenic	103	105	P/P	70 - 130
2166312	Cadmium	93.1	111	P/P	70 - 130
2166312	Chromium	101	102	P/P	70 - 130
2166312	Copper	88.9	89.3	P/P	70 - 130
2166312	Lead	103	103	P/P	70 - 130
2166312	Nickel	98.5	99.1	P/P	70 - 130
2166312	Selenium	95.5	101	P/P	70 - 130
2166312	Silver	98.5	98.8	P/P	70 - 130
2166312	Thallium	105	106	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P381636

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167088	Aluminum	105	102	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381201

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2166933	Bromide	103	101	P/P	90 - 110
2166937	Bromide	99.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381234

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2166887	Ammonia-N	103	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167073	Ammonia-N	103	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381281

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2166947	Kjeldahl Nitrogen	94.7	95.5	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381380

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167232	Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381311

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2166878	NO2NO3-N	100	99.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381390

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164597	NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2166272	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167075	Total-P	99.1	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381415

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167074	Total-P	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P381027

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2166888	O-Phosphate-P	103	105	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P381452

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2165407	Fluoride	98.4	101	P/P	91 - 105

Reference Method: SM 5310 B-2011
Batch ID: P381091

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2166887	Organic Carbon	99.8	96.7	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P381002

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167025	Turbidity	0.722	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P381003

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167072	Turbidity	12.5	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P380962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166312	Iron	0.659	Spike	P	0 - 20
2166312	Manganese	0.872	Spike	P	0 - 20
2166312	Zinc	0.657	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166312	Aluminum	1.73	Spike	P	0 - 20
2166312	Antimony	4.93	Spike	P	0 - 20
2166312	Arsenic	2.21	Spike	P	0 - 20
2166312	Cadmium	17.4	Spike	P	0 - 20
2166312	Chromium	1.37	Spike	P	0 - 20
2166312	Copper	0.410	Spike	P	0 - 20
2166312	Lead	0.0818	Spike	P	0 - 20
2166312	Nickel	0.664	Spike	P	0 - 20
2166312	Selenium	5.26	Spike	P	0 - 20
2166312	Silver	0.275	Spike	P	0 - 20
2166312	Thallium	0.878	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P381636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167088	Aluminum	1.68	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381201

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166933	Bromide	0.919	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166887	Ammonia-N	2.27	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167073	Ammonia-N	0.422	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381281

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166947	Kjeldahl Nitrogen	0.679	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381380

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167232	Kjeldahl Nitrogen	0.702	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381311

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166878	NO2NO3-N	0.468	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164597	NO2NO3-N	0.504	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166272	Total-P	0.0193	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167075	Total-P	0.629	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167074	Total-P	0.817	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P381027

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166888	O-Phosphate-P	1.62	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P381413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166937	Total Alkalinity	0.0452	Sample	P	0 - 3.3

Reference Method: SM 2540 D-2011
Batch ID: P381255

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166886	TSS	3.64	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P381452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2165407	Fluoride	1.47	Spike	P	0 - 2.0

Reference Method: SM 5310 B-2011
Batch ID: P381091

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2166887	Organic Carbon	2.82	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: A98316
Included Lab Sample IDs: 2167070, 2167071, 2167072

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.0	P/P	95 - 105
Turbidity	99.0	98.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A98329
Included Lab Sample IDs: 2167076, 2167077, 2167078

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	102	104	P/P	90 - 110
O-Phosphate-P	104	99.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A98353
Included Lab Sample IDs: 2167088, 2167089, 2167090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	101	P/P	90 - 110
Chromium	99.3	99.2	P/P	90 - 110
Copper	90.3	90.4	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Nickel	99.7	97.6	P/P	90 - 110
Thallium	98.1	96.8	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A98371
Included Lab Sample IDs: 2167073, 2167074, 2167075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.4	98.4	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A98406
Included Lab Sample IDs: 2167070, 2167071, 2167072

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A98413
Included Lab Sample IDs: 2167074, 2167075

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A98444
Included Lab Sample IDs: 2167073, 2167075

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A98451
Included Lab Sample IDs: 2167074, 2167075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	90.1	92.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A98467
Included Lab Sample IDs: 2167088, 2167089, 2167090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	94.8	95.2	P/P	90 - 110
Manganese	96.9	96.4	P/P	90 - 110
Zinc	95.0	95.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A98469
Included Lab Sample IDs: 2167088, 2167089, 2167090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	98.6	99.4	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Cadmium	100	100	P/P	90 - 110
Selenium	102	102	P/P	90 - 110
Silver	98.9	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A98480
Included Lab Sample IDs: 2167073

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A98485
Included Lab Sample IDs: 2167074

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

Reference Method: SM 2320 B-2011
Run ID: A98490
Included Lab Sample IDs: 2167070, 2167071, 2167072

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A98491
Included Lab Sample IDs: 2167073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-2011
Run ID: A98495
Included Lab Sample IDs: 2167070, 2167071, 2167072

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.1	99.5	P/P	90 - 110
Fluoride	99.5	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A98506
Included Lab Sample IDs: 2167073

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.8	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A98603
Included Lab Sample IDs: 2167074

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A98608
Included Lab Sample IDs: 2167075

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A98711
Included Lab Sample IDs: 2167089

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A98712
Included Lab Sample IDs: 2167088, 2167089

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.2	98.8	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					0.722	
	Turbidity					12.5	
EPA 200.7 Rev. 4.4	Iron	98.6	99.9	101			0.659
	Manganese	103	105	104			0.872
	Zinc	104	104	103			0.657
EPA 200.8 Rev. 5.4	Aluminum	100	97.1	98.9			1.73
	Aluminum	93.2	105	102			1.68
	Antimony	97.3	99.5	105			4.93
	Arsenic	99.4	103	105			2.21
	Cadmium	106	93.1	111			17.4
	Chromium	101	101	102			1.37
	Copper	93.3	88.9	89.3			0.410
	Lead	103	103	103			0.0818
	Nickel	98.3	98.5	99.1			0.664
	Selenium	93.5	95.5	101			5.26
	Silver	98.2	98.5	98.8			0.275
	Thallium	107	105	106			0.878
EPA 300.0 Rev. 2.1	Bromide	104	103	101	99.9		0.919
EPA 350.1 Rev. 2.0	Ammonia-N	97.7	103	106			2.27
	Ammonia-N	99.5	103	103			0.422
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.4	94.7	95.5			0.679
	Kjeldahl Nitrogen	106	103	102			0.702
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	99.9			0.468
	NO2NO3-N	99.0	99.5	99.0			0.504
EPA 365.1 Rev. 2.0	Total-P	101	106	106			0.0193
	Total-P	105	99.1	98.4			0.629
	Total-P	105	104	103			0.817
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	106	103	105			1.62
SM 2320 B-2011	Total Alkalinity	104				0.0452	
SM 2540 D-2011	TSS					3.64	
SM 4500 F-C-2011	Fluoride	98.3	98.4	101			1.47
SM 5310 B-2011	Organic Carbon	103	99.8	96.7			2.82

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2167070, 2167071, 2167072
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2167088, 2167089, 2167090
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2167088, 2167089, 2167090
EPA 300.0 Rev. 2.1	Bromide in aqueous matrices	2167070, 2167071, 2167072
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2167073, 2167074, 2167075
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2167073, 2167074, 2167075
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2167073, 2167074, 2167075
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2167073, 2167074, 2167075
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2167076, 2167077, 2167078
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2167070, 2167071, 2167072
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2167070, 2167071, 2167072
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2167070, 2167071, 2167072
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2167073, 2167074, 2167075

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	03/19/2020			03/19/2020 17:42	Julia Storbeck	2167070, 2167071, 2167072
EPA 200.7 Rev. 4.4	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/27/2020 00:13	Vijayalakshmi Reddy	2167088
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/27/2020 00:21	Vijayalakshmi Reddy	2167089
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/27/2020 00:29	Vijayalakshmi Reddy	2167090
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	04/08/2020 20:56	Betina Topolski	2167089
EPA 200.8 Rev. 5.4	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/20/2020 19:27	Alexander Thompson	2167088
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/20/2020 19:37	Alexander Thompson	2167089
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/20/2020 19:47	Alexander Thompson	2167090
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/20/2020 21:35	Alexander Thompson	2167088
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/20/2020 21:45	Alexander Thompson	2167089
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/20/2020 21:54	Alexander Thompson	2167090
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/26/2020 23:42	Alexander Thompson	2167088
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/26/2020 23:51	Alexander Thompson	2167089
	03/19/2020	03/19/2020 15:20	Elliott D. Healy	03/27/2020 00:01	Alexander Thompson	2167090
	03/19/2020	04/01/2020 13:30	Alexander Thompson	04/09/2020 01:02	Alexander Thompson	2167089
	03/19/2020	04/01/2020 13:30	Alexander Thompson	04/09/2020 01:12	Alexander Thompson	2167088
EPA 300.0 Rev. 2.1	03/19/2020			03/24/2020 10:01	Elliott Rodriguez	2167070
	03/19/2020			03/24/2020 10:18	Elliott Rodriguez	2167071
	03/19/2020			03/24/2020 10:35	Elliott Rodriguez	2167072
EPA 350.1 Rev. 2.0	03/19/2020			03/24/2020 16:31	Ping Hua	2167074
	03/19/2020			03/24/2020 16:33	Ping Hua	2167075
	03/19/2020			03/28/2020 12:29	Ping Hua	2167073
EPA 351.2 Rev. 2.0	03/19/2020	03/25/2020 09:45	Sima Feizi	03/26/2020 10:08	Jhamieka S. Greenwood	2167074
	03/19/2020	03/25/2020 09:45	Sima Feizi	03/26/2020 10:10	Jhamieka S. Greenwood	2167075
	03/19/2020	03/27/2020 09:45	Sima Feizi	03/30/2020 08:24	Jhamieka S. Greenwood	2167073
EPA 353.2 Rev. 2.0	03/19/2020			03/26/2020 08:47	Beverly Y. Sanders	2167073
	03/19/2020			03/26/2020 08:48	Beverly Y. Sanders	2167075
	03/19/2020			03/27/2020 12:12	Beverly Y. Sanders	2167074
EPA 365.1 Rev. 2.0	03/19/2020	03/26/2020 12:10	Lipi Saha	03/27/2020 10:11	Lipi Saha	2167073
	03/19/2020	03/26/2020 17:15	Yen Ta	04/01/2020 18:12	Benjamin T. Nordmann	2167075
	03/19/2020	03/27/2020 16:50	Yen Ta	04/01/2020 17:07	Benjamin T. Nordmann	2167074
EPA 365.1 Rev. 2.0 dissolved	03/19/2020			03/19/2020 16:02	Carlos Miranda	2167076
	03/19/2020			03/19/2020 16:07	Carlos Miranda	2167077
	03/19/2020			03/19/2020 16:08	Carlos Miranda	2167078
SM 2320 B-2011	03/19/2020			03/27/2020 14:09	Dale L. Simmons	2167070
	03/19/2020			03/27/2020 14:19	Dale L. Simmons	2167071
	03/19/2020			03/27/2020 14:29	Dale L. Simmons	2167072
SM 2540 D-2011	03/19/2020			03/23/2020 15:22	Yijie Li	2167070, 2167071, 2167072
SM 4500 F-C-2011	03/19/2020			03/27/2020 16:26	Dale L. Simmons	2167070
	03/19/2020			03/27/2020 16:31	Dale L. Simmons	2167071

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500 F-C-2011	03/19/2020			03/27/2020 16:51	Dale L. Simmons	2167072
SM 5310 B-2011	03/19/2020			03/21/2020 07:53	Lauren Lees	2167073
	03/19/2020			03/21/2020 08:18	Lauren Lees	2167074
	03/19/2020			03/21/2020 08:32	Lauren Lees	2167075