

Chemical Analysis Report

SW-DIST-2020-03-04-03

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

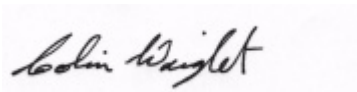
Event Description: **Run 14 North Pinellas**
Request ID: **RQ-2020-03-02-66**
Customer: **SW-DIST**
Project ID: **SMP**

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: 24-MAR-2020 16:47



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: Curlew Creek Tidal @ Pirates Cove

Collection Date/Time: 03/03/2020 12:10

Field ID: G5SW0162

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2162140	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P380055	
	EPA 300.0 Rev. 2.1	Bromide	11		mg Br/L	P380275	
	SM 2320 B-2011	Total Alkalinity	143		mg CaCO3/L	P380592	
	SM 2540 D-2011	TSS	5	I	mg/L	P380550	
	SM 4500 F-C-2011	Fluoride	0.42		mg F/L	P380683	
2162142	EPA 350.1 Rev. 2.0	Ammonia-N	0.051		mg N/L	P380468	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68		mg N/L	P380168	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.88		mg N/L	P380702	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P380365	
	SM 5310 B-2011	Organic Carbon	8.3		mg C/L	P380172	
2162144	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P380065	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Stevenson Creek Tidal @ Overlea St

Collection Date/Time: 03/03/2020 14:00

Field ID: G5SW0164

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2162141	EPA 180.1 Rev. 2.0	Turbidity	2.1	A	NTU	P380055	
	EPA 300.0 Rev. 2.1	Bromide	19		mg Br/L	P380275	
	SM 2320 B-2011	Total Alkalinity	132		mg CaCO3/L	P380587	
	SM 2540 D-2011	TSS	4	I	mg/L	P380550	
	SM 4500 F-C-2011	Fluoride	0.55		mg F/L	P380683	
2162143	EPA 350.1 Rev. 2.0	Ammonia-N	0.073		mg N/L	P380468	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P380168	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.081		mg N/L	P380702	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P380365	
	SM 5310 B-2011	Organic Carbon	8.5		mg C/L	P380172	
2162145	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P380065	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Moccasin Creek Tidal

Collection Date/Time: 03/03/2020 10:05

Field ID: G1SW0051

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2162146	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P380055	
	EPA 300.0 Rev. 2.1	Bromide	16		mg Br/L	P380275	
	SM 2320 B-2011	Total Alkalinity	157		mg CaCO3/L	P380592	
	SM 2540 D-2011	TSS	4	IA	mg/L	P380550	
	SM 4500 F-C-2011	Fluoride	0.42		mg F/L	P380596	
2162147	EPA 350.1 Rev. 2.0	Ammonia-N	0.062		mg N/L	P380608	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P380168	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.041		mg N/L	P380702	
	EPA 365.1 Rev. 2.0	Total-P	0.60		mg P/L	P380365	
	SM 5310 B-2011	Organic Carbon	13		mg C/L	P380172	
2162148	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.14		mg P/L	P380065	
2162157	EPA 200.7 Rev. 4.4	Iron	900		ug/L	P380460	
		Manganese	58		ug/L	P380460	
		Zinc	15	U	ug/L	P380460	
	EPA 200.8 Rev. 5.4	Aluminum	1.09E+03		ug/L	P380460	
		Antimony	0.21	I	ug/L	P380460	
		Arsenic	2.88		ug/L	P380460	
		Cadmium	0.080	U	ug/L	P380460	
		Chromium	3.4	I	ug/L	P380460	
		Copper	2.5	I	ug/L	P380460	
		Lead	0.94	I	ug/L	P380460	
		Nickel	2.0	U	ug/L	P380460	
		Selenium	0.80	U	ug/L	P380460	
		Silver	0.040	U	ug/L	P380460	
		Thallium	0.40	U	ug/L	P380460	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P380055

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P380460

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: P380460

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 300.0 Rev. 2.1
Batch ID: P380275

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380468

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380608

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380168

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: P380702

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380365

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380065

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

Reference Method: SM 2320 B-2011
Batch ID: P380587

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

Reference Method: SM 2320 B-2011
Batch ID: P380592

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

Reference Method: SM 2540 D-2011
Batch ID: P380550

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P380596

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-2011
Batch ID: P380683

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P380172

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: P380460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	105		P	85 - 115
Manganese	107		P	85 - 115
Zinc	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.1		P	85 - 115
Antimony	90.4		P	85 - 115
Arsenic	94.3		P	85 - 115
Cadmium	95.1		P	85 - 115
Chromium	94.6		P	85 - 115
Copper	97.7		P	85 - 115
Lead	89.6		P	85 - 115
Nickel	94.3		P	85 - 115
Selenium	94.3		P	85 - 115
Silver	91.0		P	85 - 115
Thallium	93.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380275

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380468

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380608

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380168

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380702

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: P380365

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380065

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

Reference Method: SM 2320 B-2011
Batch ID: P380587

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 106

Reference Method: SM 2320 B-2011
Batch ID: P380592

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P380596

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.0		P	92 - 103

Reference Method: SM 4500 F-C-2011
Batch ID: P380683

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.3		P	92 - 103

Reference Method: SM 5310 B-2011
Batch ID: P380172

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P380460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163449	Iron	106	107	P/P	70 - 130
2163449	Manganese	106	103	P/P	70 - 130
2163449	Zinc	109	109	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163449	Aluminum	92.3	94.0	P/P	70 - 130
2163449	Antimony	92.8	95.5	P/P	70 - 130
2163449	Arsenic	101	102	P/P	70 - 130
2163449	Cadmium	94.3	98.6	P/P	70 - 130
2163449	Chromium	95.5	98.0	P/P	70 - 130
2163449	Copper	97.5	99.4	P/P	70 - 130
2163449	Lead	91.4	92.8	P/P	70 - 130
2163449	Nickel	100	102	P/P	70 - 130
2163449	Selenium	96.5	101	P/P	70 - 130
2163449	Silver	87.0	88.0	P/P	70 - 130
2163449	Thallium	89.9	93.0	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380275

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2162533	Bromide	93.6	94.4	P/P	90 - 110
2162535	Bromide	94.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161619	Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2162379	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380168

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2162142	Kjeldahl Nitrogen	98.5	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161705	NO2NO3-N	101	100	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380365

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2162142	Total-P	105	105	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P380596

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161200	Fluoride	99.3	100	P/P	89 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P380683

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2162146	Fluoride	100	100	P/P	89 - 106

Reference Method: SM 5310 B-2011
Batch ID: P380172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2162142	Organic Carbon	98.6	98.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P380055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2162141	Turbidity	0.939	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P380460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163449	Iron	0.278	Spike	P	0 - 20
2163449	Manganese	2.72	Spike	P	0 - 20
2163449	Zinc	0.0455	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163449	Aluminum	1.80	Spike	P	0 - 20
2163449	Antimony	2.92	Spike	P	0 - 20
2163449	Arsenic	1.38	Spike	P	0 - 20
2163449	Cadmium	4.44	Spike	P	0 - 20
2163449	Chromium	2.59	Spike	P	0 - 20
2163449	Copper	1.92	Spike	P	0 - 20
2163449	Lead	1.51	Spike	P	0 - 20
2163449	Nickel	1.82	Spike	P	0 - 20
2163449	Selenium	4.79	Spike	P	0 - 20
2163449	Silver	1.15	Spike	P	0 - 20
2163449	Thallium	3.43	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380275

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2162533	Bromide	0.653	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161619	Ammonia-N	0.364	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2162379	Ammonia-N	0.131	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380168

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2162142	Kjeldahl Nitrogen	0.675	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161705	NO2NO3-N	0.391	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380365

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2162142	Total-P	0.202	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380065

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2162144	O-Phosphate-P	0.663	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P380587

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2162068	Total Alkalinity	0.0462	Sample	P	0 - 2.8

Reference Method: SM 2320 B-2011
Batch ID: P380592

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161764	Total Alkalinity	0.349	Sample	P	0 - 2.8

Reference Method: SM 4500 F-C-2011
Batch ID: P380596

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161200	Fluoride	0.516	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-2011
Batch ID: P380683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2162146	Fluoride	0.0	Spike	P	0 - 2.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-2011
Batch ID: P380172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2162142	Organic Carbon	0.335	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: A97995

Included Lab Sample IDs: 2162140, 2162141, 2162146

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A97998

Included Lab Sample IDs: 2162144, 2162145, 2162148

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.1	96.1	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A98030

Included Lab Sample IDs: 2162142, 2162143, 2162147

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.6	99.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A98056

Included Lab Sample IDs: 2162140, 2162141, 2162146

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A98065

Included Lab Sample IDs: 2162142, 2162143, 2162147

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A98131

Included Lab Sample IDs: 2162142, 2162143

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	99.7	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A98174

Included Lab Sample IDs: 2162140, 2162141, 2162146

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A98174

Included Lab Sample IDs: 2162146

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A98179

Included Lab Sample IDs: 2162147

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A98186

Included Lab Sample IDs: 2162142, 2162143, 2162147

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	97.3	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A98195

Included Lab Sample IDs: 2162157

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	102	P/P	90 - 110
Manganese	108	105	P/P	90 - 110
Zinc	107	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A98197

Included Lab Sample IDs: 2162157

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.5	95.7	P/P	90 - 110
Antimony	90.8	91.7	P/P	90 - 110
Arsenic	95.1	96.4	P/P	90 - 110
Cadmium	94.8	94.7	P/P	90 - 110
Chromium	94.0	95.2	P/P	90 - 110
Copper	96.9	98.2	P/P	90 - 110
Lead	92.7	92.5	P/P	90 - 110
Nickel	97.4	100	P/P	90 - 110
Selenium	96.2	94.9	P/P	90 - 110
Silver	92.6	92.2	P/P	90 - 110
Thallium	90.2	91.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A98204

Included Lab Sample IDs: 2162140, 2162141

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A98218

Included Lab Sample IDs: 2162147

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A98219

Included Lab Sample IDs: 2162142, 2162143

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	103	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		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					0.939	
EPA 200.7 Rev. 4.4	Iron	105	106	107			0.278
	Manganese	107	106	103			2.72
	Zinc	107	109	109			0.0455
EPA 200.8 Rev. 5.4	Aluminum	93.1	92.3	94.0			1.80
	Antimony	90.4	92.8	95.5			2.92
	Arsenic	94.3	101	102			1.38
	Cadmium	95.1	94.3	98.6			4.44
	Chromium	94.6	95.5	98.0			2.59
	Copper	97.7	97.5	99.4			1.92
	Lead	89.6	91.4	92.8			1.51
	Nickel	94.3	100	102			1.82
	Selenium	94.3	96.5	101			4.79
	Silver	91.0	87.0	88.0			1.15
	Thallium	93.8	89.9	93.0			3.43
EPA 300.0 Rev. 2.1	Bromide	99.1	93.6	94.4	94.2		0.653
EPA 350.1 Rev. 2.0	Ammonia-N	100	102	101			0.364
	Ammonia-N	98.1	102	102			0.131
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	98.5	99.4			0.675
EPA 353.2 Rev. 2.0	NO2NO3-N	100	101	100			0.391
EPA 365.1 Rev. 2.0	Total-P	103	105	105			0.202
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101					0.663
SM 2320 B-2011	Total Alkalinity	102				0.0462	
	Total Alkalinity	103				0.349	
SM 4500 F-C-2011	Fluoride	95.0	99.3	100			0.516
	Fluoride	98.3	100	100			0.0
SM 5310 B-2011	Organic Carbon	98.5	98.6	98.2			0.335

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2162140, 2162141, 2162146
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2162157
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2162157
EPA 300.0 Rev. 2.1	Bromide in aqueous matrices	2162140, 2162141, 2162146
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2162142, 2162143, 2162147
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2162142, 2162143, 2162147
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2162142, 2162143, 2162147
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2162142, 2162143, 2162147
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2162144, 2162145, 2162148
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2162140, 2162141, 2162146
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2162140, 2162141, 2162146
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2162140, 2162141, 2162146
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2162142, 2162143, 2162147

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	03/04/2020			03/04/2020 16:33	Yen Ta	2162140, 2162141, 2162146
EPA 200.7 Rev. 4.4	03/04/2020	03/11/2020 16:50	Elliott D. Healy	03/13/2020 19:03	Vijayalakshmi Reddy	2162157
EPA 200.8 Rev. 5.4	03/04/2020	03/11/2020 16:50	Elliott D. Healy	03/13/2020 13:26	Justin Cutchin	2162157
EPA 300.0 Rev. 2.1	03/04/2020			03/07/2020 00:09	Lipi Saha	2162140
	03/04/2020			03/07/2020 00:26	Lipi Saha	2162141
	03/04/2020			03/07/2020 00:43	Lipi Saha	2162146
EPA 350.1 Rev. 2.0	03/04/2020			03/09/2020 14:56	Ping Hua	2162142
	03/04/2020			03/09/2020 14:58	Ping Hua	2162143
	03/04/2020			03/10/2020 13:14	Ping Hua	2162147
EPA 351.2 Rev. 2.0	03/04/2020	03/06/2020 12:00	Sima Feizi	03/09/2020 11:29	Jhamieka S. Greenwood	2162142
	03/04/2020	03/06/2020 12:00	Sima Feizi	03/09/2020 11:48	Jhamieka S. Greenwood	2162143
	03/04/2020	03/06/2020 12:00	Sima Feizi	03/09/2020 11:50	Jhamieka S. Greenwood	2162147
EPA 353.2 Rev. 2.0	03/04/2020			03/13/2020 09:16	Beverly Y. Sanders	2162147
	03/04/2020			03/13/2020 11:00	Beverly Y. Sanders	2162142
	03/04/2020			03/13/2020 11:01	Beverly Y. Sanders	2162143
EPA 365.1 Rev. 2.0	03/04/2020	03/10/2020 13:53	Yen Ta	03/12/2020 13:42	Benjamin T. Nordmann	2162142
	03/04/2020	03/10/2020 13:53	Yen Ta	03/12/2020 13:46	Benjamin T. Nordmann	2162143
	03/04/2020	03/10/2020 13:53	Yen Ta	03/12/2020 13:47	Benjamin T. Nordmann	2162147
EPA 365.1 Rev. 2.0 dissolved	03/04/2020			03/04/2020 16:29	Carlos Miranda	2162144
	03/04/2020			03/04/2020 16:32	Carlos Miranda	2162145
	03/04/2020			03/04/2020 16:33	Carlos Miranda	2162148
SM 2320 B-2011	03/04/2020			03/12/2020 17:04	Dale L. Simmons	2162146
	03/04/2020			03/12/2020 17:16	Dale L. Simmons	2162140
	03/04/2020			03/12/2020 17:28	Dale L. Simmons	2162141
SM 2540 D-2011	03/04/2020			03/09/2020 15:13	Yijie Li	2162140, 2162141, 2162146
SM 4500 F-C-2011	03/04/2020			03/12/2020 16:03	Dale L. Simmons	2162146
	03/04/2020			03/14/2020 07:03	Dale L. Simmons	2162140
	03/04/2020			03/14/2020 07:08	Dale L. Simmons	2162141
SM 5310 B-2011	03/04/2020			03/06/2020 04:36	Lauren Lees	2162142
	03/04/2020			03/06/2020 05:16	Lauren Lees	2162143
	03/04/2020			03/06/2020 05:32	Lauren Lees	2162147