

Chemical Analysis Report

SO-DIST-2020-03-25-01

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

Event Description: **2020 SMP : Charlotte Harbor**
Request ID: **RQ-2020-03-23-38**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 14-APR-2020 13:08

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: TrailerParkCanal@Mouth

Collection Date/Time: 03/24/2020 14:40

Field ID: G3SD0072

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2167678	EPA 180.1 Rev. 2.0	Turbidity	4.6		NTU	P381301	
	EPA 300.0 Rev. 2.1	Bromide	49		mg Br/L	P381517	
	SM 2320 B-2011	Total Alkalinity	121		mg CaCO3/L	P381659	
	SM 2540 D-2011	TSS	16		mg/L	P381713	
	SM 4500 F-C-2011	Fluoride	0.98		mg F/L	P381965	
2167681	EPA 350.1 Rev. 2.0	Ammonia-N	0.023		mg N/L	P381446	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P381470	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381615	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P381368	
	SM 5310 B-2011	Organic Carbon	7.8		mg C/L	P381389	
2167684	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.078		mg P/L	P381296	

Sample Location: MyakkaCutoff(Western)

Collection Date/Time: 03/24/2020 09:30

Field ID: G3SD0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2167679	EPA 180.1 Rev. 2.0	Turbidity	4.4		NTU	P381301	
	EPA 300.0 Rev. 2.1	Bromide	51		mg Br/L	P381517	
	SM 2320 B-2011	Total Alkalinity	129		mg CaCO3/L	P381659	
	SM 2540 D-2011	TSS	12		mg/L	P381713	
	SM 4500 F-C-2011	Fluoride	1.0		mg F/L	P381965	
2167682	EPA 350.1 Rev. 2.0	Ammonia-N	0.039		mg N/L	P381446	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P381470	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P381615	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P381368	
	SM 5310 B-2011	Organic Carbon	8.2		mg C/L	P381389	
2167685	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P381296	

Sample Location: Whidden Creek South Pt

Collection Date/Time: 03/24/2020 11:10

Field ID: G2SD0029

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2167680	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P381301	
	EPA 300.0 Rev. 2.1	Bromide	75		mg Br/L	P381517	
	SM 2320 B-2011	Total Alkalinity	147	A	mg CaCO3/L	P381844	
	SM 2540 D-2011	TSS	5	I	mg/L	P381713	
	SM 4500 F-C-2011	Fluoride	1.3		mg F/L	P381849	
2167683	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P381446	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P381470	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381615	
	EPA 365.1 Rev. 2.0	Total-P	0.036		mg P/L	P381368	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P381389	
2167686	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P381296	

Sample Location: Coral Creek (East)

Collection Date/Time: 03/24/2020 13:25

Field ID: G2SD0039

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2167675	EPA 180.1 Rev. 2.0	Turbidity	2.9		NTU	P381300	
	EPA 300.0 Rev. 2.1	Bromide	68		mg Br/L	P381517	
	SM 2320 B-2011	Total Alkalinity	138		mg CaCO3/L	P381659	
	SM 2540 D-2011	TSS	12	A	mg/L	P381713	
	SM 4500 F-C-2011	Fluoride	1.3		mg F/L	P381965	
2167676	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P381446	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P381470	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381615	
	EPA 365.1 Rev. 2.0	Total-P	0.075		mg P/L	P381368	
	SM 5310 B-2011	Organic Carbon	5.8		mg C/L	P381389	
2167677	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.021		mg P/L	P381296	
2167719	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P381283	
		Manganese	5.5	I	ug/L	P381283	
		Zinc	20	U	ug/L	P381283	
		Aluminum	134		ug/L	P381283	
	EPA 200.8 Rev. 5.4	Antimony	0.22	I	ug/L	P381283	
		Arsenic	2.60		ug/L	P381283	
		Boron**	4.68E+03		ug/L	P381283	
		Cadmium	0.080	U	ug/L	P381283	
		Chromium	1.6	U	ug/L	P381283	
		Copper	1.6	U	ug/L	P381283	
		Lead	0.80	U	ug/L	P381283	
		Nickel	2.0	U	ug/L	P381283	
		Selenium	0.80	U	ug/L	P381283	
		Silver	0.040	U	ug/L	P381283	
		Thallium	0.40	U	ug/L	P381283	

Sample Location: G2SD0039_DUP

Collection Date/Time: 03/24/2020 13:30

Field ID: G2SD0039

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2167687	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P381301	
	EPA 300.0 Rev. 2.1	Bromide	70		mg Br/L	P381517	
	SM 2320 B-2011	Total Alkalinity	138		mg CaCO3/L	P381659	
	SM 2540 D-2011	TSS	11		mg/L	P381713	
	SM 4500 F-C-2011	Fluoride	1.3		mg F/L	P381965	
2167688	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P381446	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P381470	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381615	
	EPA 365.1 Rev. 2.0	Total-P	0.074		mg P/L	P381368	
	SM 5310 B-2011	Organic Carbon	5.8		mg C/L	P381389	
2167689	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.021		mg P/L	P381296	
2167720	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P381283	
		Manganese	5.4	I	ug/L	P381283	
		Zinc	20	U	ug/L	P381283	
	EPA 200.8 Rev. 5.4	Aluminum	123		ug/L	P381283	
		Antimony	0.20	U	ug/L	P381283	
		Arsenic	2.78		ug/L	P381283	
		Cadmium	0.080	U	ug/L	P381283	
		Chromium	1.6	U	ug/L	P381283	
		Copper	1.6	U	ug/L	P381283	
		Lead	0.80	U	ug/L	P381283	
		Nickel	2.0	U	ug/L	P381283	
		Selenium	0.80	U	ug/L	P381283	
		Silver	0.040	U	ug/L	P381283	
		Thallium	0.40	U	ug/L	P381283	

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P381300

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P381301

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P381283

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: P381283

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381517

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381446

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381470

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: P381615

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381368

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P381296

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

Reference Method: SM 2320 B-2011
Batch ID: P381659

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

Reference Method: SM 2320 B-2011
Batch ID: P381844

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

Reference Method: SM 2540 D-2011
Batch ID: P381713

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P381849

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-2011
Batch ID: P381965

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P381389

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: P381283

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	104		P	85 - 115
Manganese	106		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P381283

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	105		P	85 - 115
Boron	97.8		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	103		P	85 - 115
Copper	105		P	85 - 115
Lead	102		P	85 - 115
Nickel	93.9		P	85 - 115
Selenium	97.7		P	85 - 115
Silver	106		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381517

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Bromide	96.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381446

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381470

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381615

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381368

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P381296

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

Reference Method: SM 2320 B-2011
Batch ID: P381659

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 2320 B-2011
Batch ID: P381844

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.1		P	98 - 107

Reference Method: SM 4500 F-C-2011
Batch ID: P381849

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.2		P	91 - 105

Reference Method: SM 4500 F-C-2011
Batch ID: P381965

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	93.9		P	92 - 104

Reference Method: SM 5310 B-2011
Batch ID: P381389

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P381283

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167301	Iron	99.8		P	70 - 130
2167301	Manganese	98.5		P	70 - 130
2167301	Zinc	102		P	70 - 130
2167302	Iron	108	102	P/P	70 - 130
2167302	Manganese	106	101	P/P	70 - 130
2167302	Zinc	109	104	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P381283

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167301	Aluminum	106		P	70 - 130
2167301	Antimony	99.2		P	70 - 130
2167301	Arsenic	105		P	70 - 130
2167301	Boron	80.5		P	70 - 130
2167301	Cadmium	94.2		P	70 - 130
2167301	Chromium	104		P	70 - 130
2167301	Copper	107		P	70 - 130
2167301	Lead	106		P	70 - 130
2167301	Nickel	103		P	70 - 130
2167301	Selenium	93.5		P	70 - 130
2167301	Silver	99.4		P	70 - 130
2167301	Thallium	110		P	70 - 130
2167302	Aluminum	105	103	P/P	70 - 130
2167302	Antimony	100	97.7	P/P	70 - 130
2167302	Arsenic	107	104	P/P	70 - 130
2167302	Boron	114	116	P/P	70 - 130
2167302	Cadmium	93.8	94.6	P/P	70 - 130
2167302	Chromium	103	101	P/P	70 - 130
2167302	Copper	108	103	P/P	70 - 130
2167302	Lead	106	104	P/P	70 - 130
2167302	Nickel	107	106	P/P	70 - 130
2167302	Selenium	98.2	95.4	P/P	70 - 130
2167302	Silver	101	99.1	P/P	70 - 130
2167302	Thallium	112	109	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167411	Bromide	99.0	98.8	P/P	90 - 110
2167589	Bromide	98.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381446

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167676	Ammonia-N	105	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167866	Kjeldahl Nitrogen	95.4	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381615

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167669	NO2NO3-N	97.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167668	Total-P	98.0	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P381296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167672	O-Phosphate-P	97.6	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P381849

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167680	Fluoride	100	101	P/P	91 - 105

Reference Method: SM 4500 F-C-2011
Batch ID: P381965

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167664	Fluoride	101	104	P/P	91 - 105

Reference Method: SM 5310 B-2011
Batch ID: P381389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2167682	Organic Carbon	95.4	95.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P381300

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167625	Turbidity	8.96	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P381301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167731	Turbidity	7.33	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P381283

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167302	Iron	5.14	Spike	P	0 - 20
2167302	Manganese	4.50	Spike	P	0 - 20
2167302	Zinc	4.85	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P381283

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167302	Aluminum	2.18	Spike	P	0 - 20
2167302	Antimony	2.58	Spike	P	0 - 20
2167302	Arsenic	3.04	Spike	P	0 - 20
2167302	Boron	0.283	Spike	P	0 - 20
2167302	Cadmium	0.887	Spike	P	0 - 20
2167302	Chromium	2.05	Spike	P	0 - 20
2167302	Copper	4.04	Spike	P	0 - 20
2167302	Lead	2.37	Spike	P	0 - 20
2167302	Nickel	0.871	Spike	P	0 - 20
2167302	Selenium	2.94	Spike	P	0 - 20
2167302	Silver	2.17	Spike	P	0 - 20
2167302	Thallium	2.55	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P381517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167411	Bromide	0.124	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P381446

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167676	Ammonia-N	0.768	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167866	Kjeldahl Nitrogen	4.75	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381615

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167669	NO2NO3-N	3.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167668	Total-P	1.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P381296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167672	O-Phosphate-P	1.16	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P381659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168652	Total Alkalinity	0.299	Sample	P	0 - 3.3

Reference Method: SM 2320 B-2011
Batch ID: P381844

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167680	Total Alkalinity	0.0709	Sample	P	0 - 3.3

Reference Method: SM 2540 D-2011
Batch ID: P381713

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167675	TSS	6.67	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P381849

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167680	Fluoride	0.477	Spike	P	0 - 2.0

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P381965

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167664	Fluoride	1.88	Spike	P	0 - 2.0

Reference Method: SM 5310 B-2011
Batch ID: P381389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2167682	Organic Carbon	0.173	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: A98406

Included Lab Sample IDs: 2167675, 2167678, 2167679, 2167680, 2167687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	99.1	98.8	P/P	90 - 110
Bromide	99.8	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A98436

Included Lab Sample IDs: 2167677, 2167684, 2167685, 2167686, 2167689

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	99.4	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A98437

Included Lab Sample IDs: 2167675, 2167678, 2167679, 2167680, 2167687

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

Reference Method: SM 5310 B-2011

Run ID: A98483

Included Lab Sample IDs: 2167676, 2167681, 2167682, 2167683, 2167688

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	91.6	92.4	P/P	90 - 110
Organic Carbon	92.4	94.4	P/P	90 - 110
Organic Carbon	100	91.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A98492

Included Lab Sample IDs: 2167676, 2167681, 2167682, 2167683, 2167688

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A98527

Included Lab Sample IDs: 2167676, 2167681, 2167682, 2167683, 2167688

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.8	96.7	P/P	90 - 110
Kjeldahl Nitrogen	96.7	94.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A98543

Included Lab Sample IDs: 2167719, 2167720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	104	102	P/P	90 - 110
Manganese	105	102	P/P	90 - 110
Zinc	101	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A98556

Included Lab Sample IDs: 2167676, 2167681, 2167682, 2167683, 2167688

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

Reference Method: SM 2320 B-2011

Run ID: A98581

Included Lab Sample IDs: 2167675, 2167678, 2167679, 2167687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.9	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A98592

Included Lab Sample IDs: 2167719, 2167720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	105	102	P/P	90 - 110
Antimony	103	104	P/P	90 - 110
Arsenic	102	105	P/P	90 - 110
Cadmium	104	104	P/P	90 - 110
Chromium	99.3	100	P/P	90 - 110
Copper	106	106	P/P	90 - 110
Lead	99.7	99.2	P/P	90 - 110
Silver	104	104	P/P	90 - 110
Thallium	93.5	92.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A98597

Included Lab Sample IDs: 2167681, 2167682

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A98608

Included Lab Sample IDs: 2167676, 2167683, 2167688

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	98.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A98631

Included Lab Sample IDs: 2167719, 2167720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	104	97.7	P/P	90 - 110
Selenium	100	97.4	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A98665

Included Lab Sample IDs: 2167680

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-2011

Run ID: A98665

Included Lab Sample IDs: 2167680

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.3	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A98665

Included Lab Sample IDs: 2167680

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A98671

Included Lab Sample IDs: 2167719

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	96.4	96.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A98715

Included Lab Sample IDs: 2167675, 2167678, 2167679, 2167687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	95.0	100	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	MS
			LCS	SMP	MS		
EPA 180.1 Rev. 2.0	Turbidity					8.96	
	Turbidity					7.33	
EPA 200.7 Rev. 4.4	Iron	104	99.8	108	102		5.14
	Manganese	106	98.5	106	101		4.50
	Zinc	105	102	109	104		4.85
EPA 200.8 Rev. 5.4	Aluminum	103	105	103	106		2.18
	Antimony	102	100	97.7	99.2		2.58
	Arsenic	105	107	104	105		3.04
	Boron	97.8	114	116	80.5		0.283
	Cadmium	101	93.8	94.6	94.2		0.887
	Chromium	103	103	101	104		2.05
	Copper	105	108	103	107		4.04
	Lead	102	106	104	106		2.37
	Nickel	93.9	107	106	103		0.871
	Selenium	97.7	98.2	95.4	93.5		2.94
	Silver	106	101	99.1	99.4		2.17
	Thallium	103	112	109	110		2.55
EPA 300.0 Rev. 2.1	Bromide	96.4	99.0	98.8	98.6		0.124
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	105	104			0.768
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.6	95.4	101			4.75
EPA 353.2 Rev. 2.0	NO2NO3-N	97.5	97.5	100			3.03
EPA 365.1 Rev. 2.0	Total-P	105	98.0	96.7			1.19
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	97.6	99.1			1.16
SM 2320 B-2011	Total Alkalinity	101				0.299	
	Total Alkalinity	98.1				0.0709	
SM 2540 D-2011	TSS					6.67	
SM 4500 F-C-2011	Fluoride	97.2	100	101			0.477
	Fluoride	93.9	101	104			1.88
SM 5310 B-2011	Organic Carbon	102	95.4	95.2			0.173

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2167675, 2167678, 2167679, 2167680, 2167687
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2167719, 2167720
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2167719, 2167720
EPA 300.0 Rev. 2.1	Bromide in aqueous matrices	2167675, 2167678, 2167679, 2167680, 2167687
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2167676, 2167681, 2167682, 2167683, 2167688
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2167676, 2167681, 2167682, 2167683, 2167688
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2167676, 2167681, 2167682, 2167683, 2167688
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2167676, 2167681, 2167682, 2167683, 2167688
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2167677, 2167684, 2167685, 2167686, 2167689
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2167675, 2167678, 2167679, 2167680, 2167687
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2167675, 2167678, 2167679, 2167680, 2167687

Reference Method Descriptions

Method	Description	Associated Samples
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2167675, 2167678, 2167679, 2167680, 2167687
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2167676, 2167681, 2167682, 2167683, 2167688

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	03/25/2020			03/25/2020 17:03	Yen Ta	2167675, 2167678, 2167679, 2167680, 2167687
EPA 200.7 Rev. 4.4	03/25/2020	03/25/2020 14:30	Elliott D. Healy	03/30/2020 22:29	Vijayalakshmi Reddy	2167719
	03/25/2020	03/25/2020 14:30	Elliott D. Healy	03/30/2020 22:37	Vijayalakshmi Reddy	2167720
EPA 200.8 Rev. 5.4	03/25/2020	03/25/2020 14:30	Elliott D. Healy	04/01/2020 20:44	Justin Cutchin	2167719
	03/25/2020	03/25/2020 14:30	Elliott D. Healy	04/01/2020 20:51	Justin Cutchin	2167720
	03/25/2020	03/25/2020 14:30	Elliott D. Healy	04/02/2020 23:39	Justin Cutchin	2167719
	03/25/2020	03/25/2020 14:30	Elliott D. Healy	04/02/2020 23:45	Justin Cutchin	2167720
	03/25/2020	03/25/2020 14:30	Elliott D. Healy	04/03/2020 21:01	Justin Cutchin	2167719
EPA 300.0 Rev. 2.1	03/25/2020			03/27/2020 17:21	Elliott Rodriguez	2167675
	03/25/2020			03/27/2020 17:38	Elliott Rodriguez	2167678
	03/25/2020			03/27/2020 17:55	Elliott Rodriguez	2167679
	03/25/2020			03/27/2020 18:46	Elliott Rodriguez	2167680
	03/25/2020			03/27/2020 19:04	Elliott Rodriguez	2167687
EPA 350.1 Rev. 2.0	03/25/2020			03/29/2020 13:53	Ping Hua	2167676
	03/25/2020			03/29/2020 13:57	Ping Hua	2167688
	03/25/2020			03/29/2020 14:06	Ping Hua	2167681
	03/25/2020			03/29/2020 14:08	Ping Hua	2167682
	03/25/2020			03/29/2020 14:09	Ping Hua	2167683
EPA 351.2 Rev. 2.0	03/25/2020	03/30/2020 09:27	Sima Feizi	03/31/2020 08:00	Jhamieka S. Greenwood	2167676
	03/25/2020	03/30/2020 09:27	Sima Feizi	03/31/2020 08:05	Jhamieka S. Greenwood	2167681
	03/25/2020	03/30/2020 09:27	Sima Feizi	03/31/2020 08:07	Jhamieka S. Greenwood	2167682
	03/25/2020	03/30/2020 09:27	Sima Feizi	03/31/2020 08:08	Jhamieka S. Greenwood	2167683
	03/25/2020	03/30/2020 09:27	Sima Feizi	03/31/2020 08:10	Jhamieka S. Greenwood	2167688
EPA 353.2 Rev. 2.0	03/25/2020			03/31/2020 16:33	Lauren Lees	2167676
	03/25/2020			03/31/2020 16:34	Lauren Lees	2167688
	03/25/2020			03/31/2020 16:35	Lauren Lees	2167681
	03/25/2020			03/31/2020 16:36	Lauren Lees	2167682
	03/25/2020			03/31/2020 16:38	Lauren Lees	2167683
EPA 365.1 Rev. 2.0	03/25/2020	03/26/2020 17:15	Yen Ta	04/01/2020 16:22	Benjamin T. Nordmann	2167681
	03/25/2020	03/26/2020 17:15	Yen Ta	04/01/2020 16:23	Benjamin T. Nordmann	2167682
	03/25/2020	03/26/2020 17:15	Yen Ta	04/01/2020 19:26	Benjamin T. Nordmann	2167676
	03/25/2020	03/26/2020 17:15	Yen Ta	04/01/2020 19:27	Benjamin T. Nordmann	2167683
	03/25/2020	03/26/2020 17:15	Yen Ta	04/01/2020 19:28	Benjamin T. Nordmann	2167688
EPA 365.1 Rev. 2.0 dissolved	03/25/2020			03/25/2020 17:43	Julia Storbeck	2167677
	03/25/2020			03/25/2020 17:44	Julia Storbeck	2167689
	03/25/2020			03/25/2020 17:45	Julia Storbeck	2167684, 2167685
	03/25/2020			03/25/2020 17:48	Julia Storbeck	2167686
SM 2320 B-2011	03/25/2020			04/01/2020 14:16	Dale L. Simmons	2167675
	03/25/2020			04/01/2020 14:26	Dale L. Simmons	2167678

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2320 B-2011	03/25/2020			04/01/2020 14:36	Dale L. Simmons	2167679
	03/25/2020			04/01/2020 14:46	Dale L. Simmons	2167687
	03/25/2020			04/05/2020 16:31	Samantha Davila	2167680
SM 2540 D-2011	03/25/2020			03/27/2020 15:32	Yijie Li	2167675, 2167678, 2167679, 2167680, 2167687
SM 4500 F-C-2011	03/25/2020			04/05/2020 15:53	Samantha Davila	2167680
	03/25/2020			04/09/2020 03:03	Samantha Davila	2167675
	03/25/2020			04/09/2020 03:08	Samantha Davila	2167678
	03/25/2020			04/09/2020 03:14	Samantha Davila	2167679
	03/25/2020			04/09/2020 03:19	Samantha Davila	2167687
SM 5310 B-2011	03/25/2020			03/27/2020 01:44	Madeline Gruver	2167682
	03/25/2020			03/27/2020 03:59	Madeline Gruver	2167676
	03/25/2020			03/27/2020 04:11	Madeline Gruver	2167681
	03/25/2020			03/27/2020 04:23	Madeline Gruver	2167683
	03/25/2020			03/27/2020 05:16	Madeline Gruver	2167688