Chemical Analysis Report

SO-DIST-2021-03-24-01

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

Event Description: **2021 SMP : Charlotte Harbor**
Request ID: **RQ-2021-03-22-44**
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
Attn: Chris Hormuth

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: 15-APR-2021 09:17

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: Trailer Park Canal **Collection Date/Time: 03/23/2021 10:40**

Field ID: G3SD0072 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2233286	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P395457	
	SM 2320 B-2011	Total Alkalinity	115		mg CaCO3/L	P395528	
	SM 2540 D-2011	TSS	3	U	mg/L	P395856	
	SM 4500 F-C-2011	Fluoride	0.96		mg F/L	P395530	
2233287	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P395903	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P395871	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P395594	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P395542	
	SM 5310 B-2011	Organic Carbon	8.4		mg C/L	P395844	
2233288	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P395437	
2233306	EPA 200.7 Rev. 4.4	Calcium	300		mg/L	P395611	
		Chromium	6.9	I	ug/L	P395611	
		Iron	120	U	ug/L	P395611	
		Magnesium	823		mg/L	P395611	
		Manganese	9.8	I	ug/L	P395611	
		Zinc	20	U	ug/L	P395611	
	EPA 200.8 Rev. 5.4	Aluminum	85	I	ug/L	P395611	
		Antimony	0.20	U	ug/L	P395611	
		Arsenic	1.76		ug/L	P395611	
		Beryllium	0.10	U	ug/L	P395611	
		Cadmium	0.080	U	ug/L	P395611	
		Copper	1.6	U	ug/L	P395611	
		Lead	0.80	U	ug/L	P395611	
		Nickel	2.0	U	ug/L	P395611	
		Selenium	0.80	U	ug/L	P395611	
		Silver	0.040	U	ug/L	P395611	
		Thallium	0.40	U	ug/L	P395611	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and magnesium are unavailable because of high analyte concentration in the QC sample.

Sample Location: Coral Creek (East) Upstream of Golf Course **Collection Date/Time: 03/23/2021 12:25**

Field ID: G2SD0039 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2233289	EPA 180.1 Rev. 2.0	Turbidity	5.4		NTU	P395457	
	SM 2320 B-2011	Total Alkalinity	120		mg CaCO3/L	P395528	
	SM 2540 D-2011	TSS	12		mg/L	P395856	
	SM 4500 F-C-2011	Fluoride	1.2		mg F/L	P395530	
2233291	EPA 350.1 Rev. 2.0	Ammonia-N	0.034		mg N/L	P395903	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P395871	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P395594	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P395542	
	SM 5310 B-2011	Organic Carbon	5.3		mg C/L	P395844	
2233293	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P395437	

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

Sample Location: Coral Creek East **Collection Date/Time: 03/23/2021 14:05**

Field ID: G2SD0046 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2233290	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P395457	
	SM 2320 B-2011	Total Alkalinity	156		mg CaCO3/L	P395528	
	SM 2540 D-2011	TSS	3	I A	mg/L	P395856	
	SM 4500 F-C-2011	Fluoride	1.2		mg F/L	P395530	
2233292	EPA 350.1 Rev. 2.0	Ammonia-N	0.036		mg N/L	P395903	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P395871	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P395594	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P395542	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P395844	
2233294	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P395437	

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P395457

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P395611

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395611

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	U	ug/L
Cadmium	0.020	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 350.1 Rev. 2.0
Batch ID: P395903

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395871

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395594

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395542

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395437

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

Reference Method: SM 2320 B-2011
Batch ID: P395528

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

Reference Method: SM 2540 D-2011
Batch ID: P395856

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P395530

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P395844

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: P395611

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Chromium	97.5		P	85 - 115
Iron	105		P	85 - 115
Magnesium	99.3		P	85 - 115
Manganese	103		P	85 - 115
Zinc	99.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395611

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.1		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	96.7		P	85 - 115
Beryllium	88.0		P	85 - 115
Cadmium	98.6		P	85 - 115
Copper	96.8		P	85 - 115
Lead	99.5		P	85 - 115
Nickel	98.3		P	85 - 115
Selenium	97.6		P	85 - 115
Silver	103		P	85 - 115
Thallium	105		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395903

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395871

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395594

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395542

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395437

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.3		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-2011
Batch ID: P395528

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

Reference Method: SM 4500 F-C-2011
Batch ID: P395530

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.3		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P395844

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P395611

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2233660	Chromium	94.4	92.5	P/P	70 - 130
2233660	Iron	103	98.8	P/P	70 - 130
2233660	Manganese	100	97.0	P/P	70 - 130
2233660	Zinc	101	100	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395611

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2233660	Aluminum	101	100	P/P	70 - 130
2233660	Antimony	104	103	P/P	70 - 130
2233660	Arsenic	103	104	P/P	70 - 130
2233660	Beryllium	107	106	P/P	70 - 130
2233660	Cadmium	94.7	95.5	P/P	70 - 130
2233660	Copper	104	102	P/P	70 - 130
2233660	Lead	99.7	99.7	P/P	70 - 130
2233660	Nickel	106	106	P/P	70 - 130
2233660	Selenium	102	101	P/P	70 - 130
2233660	Silver	94.3	91.0	P/P	70 - 130
2233660	Thallium	104	105	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395903

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2233142	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2233287	Kjeldahl Nitrogen	103	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232840	NO2NO3-N	98.2	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395542

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232839	Total-P	98.2	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395437

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2233240	O-Phosphate-P	99.0	99.8	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P395530

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2233341	Fluoride	95.9	95.9	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P395844

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2233343	Organic Carbon	87.2	87.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P395457

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233260	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P395611

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233660	Calcium	3.70	Spike	P	0 - 20
2233660	Chromium	2.02	Spike	P	0 - 20
2233660	Iron	3.10	Spike	P	0 - 20
2233660	Magnesium	3.89	Spike	P	0 - 20
2233660	Manganese	2.30	Spike	P	0 - 20
2233660	Zinc	0.493	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395611

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233660	Aluminum	0.159	Spike	P	0 - 20
2233660	Antimony	0.963	Spike	P	0 - 20
2233660	Arsenic	0.957	Spike	P	0 - 20
2233660	Beryllium	0.423	Spike	P	0 - 20
2233660	Cadmium	0.838	Spike	P	0 - 20
2233660	Copper	2.08	Spike	P	0 - 20
2233660	Lead	0.0234	Spike	P	0 - 20
2233660	Nickel	0.394	Spike	P	0 - 20
2233660	Selenium	0.635	Spike	P	0 - 20
2233660	Silver	3.55	Spike	P	0 - 20
2233660	Thallium	1.21	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395903

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233142	Ammonia-N	1.41	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395871

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233287	Kjeldahl Nitrogen	3.17	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232840	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395542

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232839	Total-P	1.83	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233240	O-Phosphate-P	0.805	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P395528

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233341	Total Alkalinity	1.60	Sample	P	0 - 8.1

Reference Method: SM 4500 F-C-2011
Batch ID: P395530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233341	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P395844

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233343	Organic Carbon	0.507	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A104252
Included Lab Sample IDs: 2233288, 2233293, 2233294

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.8	98.1	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A104266
Included Lab Sample IDs: 2233286, 2233289, 2233290

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	101	P/P	95 - 105

Reference Method: SM 2320 B-2011
Run ID: A104294
Included Lab Sample IDs: 2233286, 2233289, 2233290

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.9	97.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A104294
Included Lab Sample IDs: 2233286, 2233289, 2233290

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A104327
Included Lab Sample IDs: 2233287, 2233291, 2233292

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A104334
Included Lab Sample IDs: 2233291, 2233292

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A104335
Included Lab Sample IDs: 2233287

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	106	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A104403
Included Lab Sample IDs: 2233306

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	103	P/P	90 - 110
Antimony	98.8	97.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A104403
Included Lab Sample IDs: 2233306

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.2	98.9	P/P	90 - 110
Beryllium	102	102	P/P	90 - 110
Cadmium	99.0	96.8	P/P	90 - 110
Copper	100	101	P/P	90 - 110
Lead	100	98.7	P/P	90 - 110
Nickel	102	102	P/P	90 - 110
Selenium	98.8	98.8	P/P	90 - 110
Silver	96.7	95.2	P/P	90 - 110
Thallium	105	104	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A104442
Included Lab Sample IDs: 2233287, 2233291, 2233292

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.0	96.4	P/P	90 - 110
Organic Carbon	96.4	96.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A104463
Included Lab Sample IDs: 2233287, 2233291, 2233292

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.4	99.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A104501
Included Lab Sample IDs: 2233287, 2233291, 2233292

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.8	97.8	P/P	90 - 110
Kjeldahl Nitrogen	97.8	93.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A104609
Included Lab Sample IDs: 2233306

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Chromium	102	101	P/P	90 - 110
Iron	103	102	P/P	90 - 110
Magnesium	98.4	97.8	P/P	90 - 110
Manganese	103	103	P/P	90 - 110
Zinc	103	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		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					0.0	
EPA 200.7 Rev. 4.4	Calcium	104					3.70
	Chromium	97.5	94.4	92.5			2.02
	Iron	105	103	98.8			3.10
	Magnesium	99.3					3.89
	Manganese	103	100	97.0			2.30
	Zinc	99.7	101	100			0.493
EPA 200.8 Rev. 5.4	Aluminum	98.1	101	100			0.159
	Antimony	102	104	103			0.963
	Arsenic	96.7	103	104			0.957
	Beryllium	88.0	107	106			0.423
	Cadmium	98.6	94.7	95.5			0.838
	Copper	96.8	104	102			2.08
	Lead	99.5	99.7	99.7			0.0234
	Nickel	98.3	106	106			0.394
	Selenium	97.6	102	101			0.635
	Silver	103	94.3	91.0			3.55
	Thallium	105	104	105			1.21
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	101	102			1.41
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	103	107			3.17
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	98.2	98.2			0.0
EPA 365.1 Rev. 2.0	Total-P	108	98.2	100			1.83
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.3	99.0	99.8			0.805
SM 2320 B-2011	Total Alkalinity	101				1.60	
SM 4500 F-C-2011	Fluoride	98.3	95.9	95.9			0.0
SM 5310 B-2011	Organic Carbon	95.8	87.2	87.8			0.507

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2233286, 2233289, 2233290
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2233306
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2233306
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2233287, 2233291, 2233292
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2233287, 2233291, 2233292
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2233287, 2233291, 2233292
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2233287, 2233291, 2233292
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2233288, 2233293, 2233294
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2233286, 2233289, 2233290
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2233286, 2233289, 2233290
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2233286, 2233289, 2233290
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2233287, 2233291, 2233292

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	03/24/2021			03/24/2021 15:19	Blanca Fach	2233286, 2233289, 2233290
EPA 200.7 Rev. 4.4	03/24/2021	03/29/2021 15:05	Elliott D. Healy	04/10/2021 02:03	Betina Topolski	2233306
	03/24/2021	03/29/2021 15:05	Elliott D. Healy	04/10/2021 02:15	Betina Topolski	2233306
EPA 200.8 Rev. 5.4	03/24/2021	03/29/2021 15:05	Elliott D. Healy	03/31/2021 14:52	Alexander Thompson	2233306
	03/24/2021	03/29/2021 15:05	Elliott D. Healy	03/31/2021 16:47	Alexander Thompson	2233306
EPA 350.1 Rev. 2.0	03/24/2021			04/02/2021 18:18	Ping Hua	2233287
	03/24/2021			04/02/2021 18:19	Ping Hua	2233291
	03/24/2021			04/02/2021 18:20	Ping Hua	2233292
EPA 351.2 Rev. 2.0	03/24/2021	04/02/2021 16:46	Benjamin T. Nordmann	04/05/2021 16:45	Virginia P. Brown	2233287
	03/24/2021	04/02/2021 16:46	Benjamin T. Nordmann	04/05/2021 16:53	Virginia P. Brown	2233291
	03/24/2021	04/02/2021 16:46	Benjamin T. Nordmann	04/05/2021 16:55	Virginia P. Brown	2233292
EPA 353.2 Rev. 2.0	03/24/2021			03/29/2021 10:14	Beverly Y. Sanders	2233287
	03/24/2021			03/29/2021 10:15	Beverly Y. Sanders	2233291
	03/24/2021			03/29/2021 10:17	Beverly Y. Sanders	2233292
EPA 365.1 Rev. 2.0	03/24/2021	03/26/2021 12:49	Yen Ta	03/29/2021 13:49	Shengyu Ding	2233291, 2233292
	03/24/2021	03/26/2021 12:49	Yen Ta	03/29/2021 14:38	Shengyu Ding	2233287
EPA 365.1 Rev. 2.0 dissolved	03/24/2021			03/24/2021 15:07	Patrick M. Roche	2233288
	03/24/2021			03/24/2021 15:08	Patrick M. Roche	2233293
	03/24/2021			03/24/2021 15:09	Patrick M. Roche	2233294
SM 2320 B-2011	03/24/2021			03/26/2021 01:32	Dale L. Simmons	2233286
	03/24/2021			03/26/2021 01:46	Dale L. Simmons	2233289
	03/24/2021			03/26/2021 02:01	Dale L. Simmons	2233290
SM 2540 D-2011	03/24/2021			03/26/2021 15:08	Yijie Li	2233286, 2233289, 2233290
SM 4500 F-C-2011	03/24/2021			03/25/2021 23:36	Dale L. Simmons	2233286
	03/24/2021			03/25/2021 23:41	Dale L. Simmons	2233289
	03/24/2021			03/25/2021 23:46	Dale L. Simmons	2233290
SM 5310 B-2011	03/24/2021			04/01/2021 05:03	Madeline Gruver	2233287
	03/24/2021			04/01/2021 06:16	Madeline Gruver	2233291
	03/24/2021			04/01/2021 07:21	Madeline Gruver	2233292