

Chemical Analysis Report

SO-DIST-2021-08-27-01

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-2021-08-23-38**
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: Liang Lin, Environmental Administrator

Date Certified: 22-SEP-2021 15:39

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

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: 08/26/2021 09:30

Field ID: G3SD0072

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2272348	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P403097	
	SM 2320 B-2011	Total Alkalinity	104		mg CaCO3/L	P403167	
	SM 2540 D-2011	TSS	3	I	mg/L	P403397	
	SM 4500 F-C-2011	Fluoride	0.39		mg F/L	P403169	
2272349	EPA 350.1 Rev. 2.0	Ammonia-N	0.19		mg N/L	P403319	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P403353	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.064		mg N/L	P403248	
	EPA 365.1 Rev. 2.0	Total-P	0.36		mg P/L	P403134	
	SM 5310 B-2011	Organic Carbon	20		mg C/L	P403345	
2272350	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.30		mg P/L	P403092	
2272368	EPA 200.7 Rev. 4.4	Calcium	96.6		mg/L	P403121	
		Iron	330		ug/L	P403121	
		Magnesium	205		mg/L	P403121	
		Manganese	20.9		ug/L	P403121	
		Zinc	5.7	I	ug/L	P403121	
	EPA 200.8 Rev. 5.4	Aluminum	71		ug/L	P403121	
		Antimony	0.16	I	ug/L	P403121	
		Arsenic	2.19		ug/L	P403121	
		Beryllium	0.025	I	ug/L	P403121	
		Cadmium	0.020	U	ug/L	P403121	
		Chromium	0.47	I	ug/L	P403121	
		Copper	1.89		ug/L	P403121	
		Lead	0.20	U	ug/L	P403121	
		Nickel	0.50	U	ug/L	P403121	
		Selenium	0.25	I	ug/L	P403121	
		Silver	0.010	U	ug/L	P403121	
		Thallium	0.10	U	ug/L	P403121	

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) Upstream of Golf Course

Collection Date/Time: 08/26/2021 11:05

Field ID: G2SD0039

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2272351	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P403097	
	SM 2320 B-2011	Total Alkalinity	142		mg CaCO3/L	P403301	
	SM 2540 D-2011	TSS	7	I	mg/L	P403399	
	SM 4500 F-C-2011	Fluoride	0.69		mg F/L	P403303	
2272353	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P403360	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.80		mg N/L	P403353	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P403248	
	EPA 365.1 Rev. 2.0	Total-P	0.060		mg P/L	P403257	
	SM 5310 B-2011	Organic Carbon	18		mg C/L	P403241	
2272355	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P403092	

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: CoralCreekEast

Collection Date/Time: 08/26/2021 12:10

Field ID: G2SD0046

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2272352	EPA 180.1 Rev. 2.0	Turbidity	11		NTU	P403097	
	SM 2320 B-2011	Total Alkalinity	172	A	mg CaCO3/L	P403301	
	SM 2540 D-2011	TSS	10	I	mg/L	P403399	
	SM 4500 F-C-2011	Fluoride	0.43		mg F/L	P403303	
2272354	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P403360	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P403354	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P403248	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P403257	
	SM 5310 B-2011	Organic Carbon	27		mg C/L	P403620	
2272356	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P403092	

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: P403097

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P403121

Component	Result	Code	Units
Calcium	0.075	U	mg/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: P403121

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
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 350.1 Rev. 2.0
Batch ID: P403319

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403360

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403353

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403354

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: P403248

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403134

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403257

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403092

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

Reference Method: SM 2320 B-2011
Batch ID: P403167

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

Reference Method: SM 2320 B-2011
Batch ID: P403301

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

Reference Method: SM 2540 D-2011
Batch ID: P403397

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P403399

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P403169

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P403303

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P403241

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

Reference Method: SM 5310 B-2011
Batch ID: P403345

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

Reference Method: SM 5310 B-2011
Batch ID: P403620

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: P403121

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	96.0		P	85 - 115
Magnesium	97.5		P	85 - 115
Manganese	92.9		P	85 - 115
Zinc	92.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P403121

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	103		P	85 - 115
Beryllium	102		P	85 - 115
Cadmium	98.2		P	85 - 115
Chromium	102		P	85 - 115
Copper	103		P	85 - 115
Lead	104		P	85 - 115
Nickel	104		P	85 - 115
Selenium	102		P	85 - 115
Silver	108		P	85 - 115
Thallium	104		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P403319

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P403360

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P403353

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P403354

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P403248

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: P403134

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403257

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403092

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

Reference Method: SM 2320 B-2011
Batch ID: P403167

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	94 - 106

Reference Method: SM 2320 B-2011
Batch ID: P403301

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P403169

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P403303

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

Reference Method: SM 5310 B-2011
Batch ID: P403241

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P403345

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.2		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P403620

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P403121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272208	Calcium	103		P	80 - 120
2272208	Iron	106	108	P/P	80 - 120
2272208	Magnesium	107	110	P/P	80 - 120
2272208	Manganese	98.9	103	P/P	80 - 120
2272208	Zinc	99.6	103	P/P	80 - 120
2272344	Calcium	97.6		P	80 - 120
2272344	Iron	91.5		P	80 - 120
2272344	Magnesium	99.2		P	80 - 120
2272344	Manganese	88.1		P	80 - 120
2272344	Zinc	90.3		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P403121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272208	Aluminum	98.6	103	P/P	80 - 120
2272208	Antimony	105	105	P/P	80 - 120
2272208	Arsenic	100	101	P/P	80 - 120
2272208	Beryllium	99.9	98.0	P/P	80 - 120
2272208	Cadmium	100	101	P/P	80 - 120
2272208	Chromium	103	102	P/P	80 - 120
2272208	Copper	101	98.8	P/P	80 - 120
2272208	Lead	106	106	P/P	80 - 120
2272208	Nickel	102	101	P/P	80 - 120
2272208	Selenium	98.6	99.9	P/P	80 - 120
2272208	Silver	107	107	P/P	80 - 120
2272208	Thallium	107	107	P/P	80 - 120
2272344	Aluminum	100		P	80 - 120
2272344	Antimony	106		P	80 - 120
2272344	Arsenic	101		P	80 - 120
2272344	Beryllium	96.0		P	80 - 120
2272344	Cadmium	99.4		P	80 - 120
2272344	Chromium	103		P	80 - 120
2272344	Copper	97.7		P	80 - 120
2272344	Lead	105		P	80 - 120
2272344	Nickel	101		P	80 - 120
2272344	Selenium	99.4		P	80 - 120
2272344	Silver	105		P	80 - 120
2272344	Thallium	107		P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P403319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272953	Ammonia-N	98.6	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P403360

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273394	Ammonia-N	103	103	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403353

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272333	Kjeldahl Nitrogen	97.8	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403354

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272759	Kjeldahl Nitrogen	100	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403248

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272331	NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2270696	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272353	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403092

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272356	O-Phosphate-P	94.1	93.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P403169

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272393	Fluoride	98.4	98.4	P/P	92 - 107

Reference Method: SM 4500 F-C-2011
Batch ID: P403303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272352	Fluoride	98.0	99.4	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P403241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272353	Organic Carbon	97.2	96.5	P/P	85 - 115

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P403345

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272233	Organic Carbon	96.2	98.8	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P403620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272930	Organic Carbon	94.2	94.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P403097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272313	Turbidity	5.92	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P403121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272208	Calcium	3.07	Spike	P	0 - 20
2272208	Iron	2.31	Spike	P	0 - 20
2272208	Magnesium	2.62	Spike	P	0 - 20
2272208	Manganese	3.68	Spike	P	0 - 20
2272208	Zinc	2.94	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P403121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272208	Aluminum	3.49	Spike	P	0 - 20
2272208	Antimony	0.549	Spike	P	0 - 20
2272208	Arsenic	0.783	Spike	P	0 - 20
2272208	Beryllium	1.76	Spike	P	0 - 20
2272208	Cadmium	0.464	Spike	P	0 - 20
2272208	Chromium	0.638	Spike	P	0 - 20
2272208	Copper	1.95	Spike	P	0 - 20
2272208	Lead	0.270	Spike	P	0 - 20
2272208	Nickel	1.16	Spike	P	0 - 20
2272208	Selenium	1.32	Spike	P	0 - 20
2272208	Silver	0.431	Spike	P	0 - 20
2272208	Thallium	0.664	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272953	Ammonia-N	1.65	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403360

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273394	Ammonia-N	0.512	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403353

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272333	Kjeldahl Nitrogen	0.932	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403354

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272759	Kjeldahl Nitrogen	0.791	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403248

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272331	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270696	Total-P	1.54	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272353	Total-P	1.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403092

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272356	O-Phosphate-P	0.747	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P403167

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272393	Total Alkalinity	0.0994	Sample	P	0 - 5.2

Reference Method: SM 2320 B-2011
Batch ID: P403301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272352	Total Alkalinity	0.978	Sample	P	0 - 5.2

Reference Method: SM 4500 F-C-2011
Batch ID: P403169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272393	Fluoride	0.0	Spike	P	0 - 2.1

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P403303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272352	Fluoride	0.915	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P403241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272353	Organic Carbon	0.528	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P403345

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272233	Organic Carbon	1.58	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P403620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272930	Organic Carbon	0.584	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: A107515

Included Lab Sample IDs: 2272350, 2272355, 2272356

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A107517

Included Lab Sample IDs: 2272348, 2272351, 2272352

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

Reference Method: SM 2320 B-2011

Run ID: A107559

Included Lab Sample IDs: 2272348

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

Reference Method: SM 4500 F-C-2011

Run ID: A107559

Included Lab Sample IDs: 2272348

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107562

Included Lab Sample IDs: 2272349

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.6	98.4	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A107593

Included Lab Sample IDs: 2272353

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.1	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A107595

Included Lab Sample IDs: 2272349, 2272353, 2272354

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107604

Included Lab Sample IDs: 2272368

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107604

Included Lab Sample IDs: 2272368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	95.6	95.7	P/P	90 - 110
Magnesium	95.9	96.1	P/P	90 - 110
Manganese	100	97.2	P/P	90 - 110
Zinc	98.2	95.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107605

Included Lab Sample IDs: 2272368

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.1	101	P/P	90 - 110
Antimony	103	105	P/P	90 - 110
Arsenic	98.6	99.8	P/P	90 - 110
Beryllium	96.8	94.5	P/P	90 - 110
Cadmium	98.2	98.8	P/P	90 - 110
Chromium	98.8	102	P/P	90 - 110
Copper	95.6	98.2	P/P	90 - 110
Lead	98.7	100	P/P	90 - 110
Nickel	96.5	99.2	P/P	90 - 110
Selenium	97.3	99.4	P/P	90 - 110
Silver	101	102	P/P	90 - 110
Thallium	102	103	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A107614

Included Lab Sample IDs: 2272351, 2272352

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.6	103	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A107614

Included Lab Sample IDs: 2272351, 2272352

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107618

Included Lab Sample IDs: 2272349

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.4	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107622

Included Lab Sample IDs: 2272353, 2272354

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A107635

Included Lab Sample IDs: 2272349

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107641

Included Lab Sample IDs: 2272353, 2272354

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107660

Included Lab Sample IDs: 2272349, 2272353, 2272354

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.5	97.5	P/P	90 - 110
Kjeldahl Nitrogen	98.8	95.5	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A107751

Included Lab Sample IDs: 2272354

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

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					5.92	
EPA 200.7 Rev. 4.4	Calcium	100	103	97.6			3.07
	Iron	96.0	106	108	91.5		2.31
	Magnesium	97.5	107	110	99.2		2.62
	Manganese	92.9	98.9	103	88.1		3.68
	Zinc	92.2	99.6	103	90.3		2.94
EPA 200.8 Rev. 5.4	Aluminum	101	98.6	103	100		3.49
	Antimony	105	105	105	106		0.549
	Arsenic	103	100	101	101		0.783
	Beryllium	102	99.9	98.0	96.0		1.76
	Cadmium	98.2	100	101	99.4		0.464
	Chromium	102	103	102	103		0.638
	Copper	103	101	98.8	97.7		1.95
	Lead	104	106	106	105		0.270
	Nickel	104	102	101	101		1.16
	Selenium	102	98.6	99.9	99.4		1.32
	Silver	108	107	107	105		0.431
	Thallium	104	107	107	107		0.664
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	98.6	100			1.65
	Ammonia-N	99.4	103	103			0.512
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.4	97.8	96.8			0.932
	Kjeldahl Nitrogen	94.5	100	101			0.791
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	102	101			0.494
EPA 365.1 Rev. 2.0	Total-P	106	106	105			1.54
	Total-P	104	102	103			1.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	94.1	93.4			0.747
SM 2320 B-2011	Total Alkalinity	103				0.0994	
	Total Alkalinity	102				0.978	
SM 4500 F-C-2011	Fluoride	99.0	98.4	98.4			0.0
	Fluoride	99.8	98.0	99.4			0.915
SM 5310 B-2011	Organic Carbon	96.4	97.2	96.5			0.528
	Organic Carbon	99.2	96.2	98.8			1.58
	Organic Carbon	97.6	94.2	94.8			0.584

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2272348, 2272351, 2272352
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2272368
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2272368
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2272349, 2272353, 2272354
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2272349, 2272353, 2272354
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2272349, 2272353, 2272354
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2272349, 2272353, 2272354
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2272350, 2272355, 2272356
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2272348, 2272351, 2272352
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2272348, 2272351, 2272352
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2272348, 2272351, 2272352
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2272349, 2272353, 2272354

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	08/27/2021			08/27/2021 15:00	Sarah A Nixon	2272348, 2272351, 2272352
EPA 200.7 Rev. 4.4	08/27/2021	08/30/2021 13:10	Elliott D. Healy	09/02/2021 04:08	Josef B Mick	2272368
	08/27/2021	08/30/2021 13:10	Elliott D. Healy	09/02/2021 04:16	Josef B Mick	2272368
EPA 200.8 Rev. 5.4	08/27/2021	08/30/2021 13:10	Elliott D. Healy	09/01/2021 16:30	Alexander Thompson	2272368
EPA 350.1 Rev. 2.0	08/27/2021			09/02/2021 11:47	Ping Hua	2272349
	08/27/2021			09/03/2021 12:04	Ping Hua	2272353
	08/27/2021			09/03/2021 12:06	Ping Hua	2272354
EPA 351.2 Rev. 2.0	08/27/2021	09/03/2021 17:03	Benjamin T. Nordmann	09/07/2021 10:22	Alexandra J Mattheus	2272349
	08/27/2021	09/03/2021 17:03	Benjamin T. Nordmann	09/07/2021 10:23	Alexandra J Mattheus	2272353
	08/27/2021	09/03/2021 17:03	Benjamin T. Nordmann	09/07/2021 10:35	Alexandra J Mattheus	2272354
EPA 353.2 Rev. 2.0	08/27/2021			09/01/2021 10:33	Beverly Y. Sanders	2272349
	08/27/2021			09/01/2021 10:34	Beverly Y. Sanders	2272353
	08/27/2021			09/01/2021 10:35	Beverly Y. Sanders	2272354
EPA 365.1 Rev. 2.0	08/27/2021	08/30/2021 14:00	Simonne.V. Calhoun	08/31/2021 11:01	Shengyu Ding	2272349
	08/27/2021	09/01/2021 14:48	Simonne.V. Calhoun	09/02/2021 15:38	Lipi Saha	2272353
	08/27/2021	09/01/2021 14:48	Simonne.V. Calhoun	09/02/2021 15:39	Lipi Saha	2272354
EPA 365.1 Rev. 2.0 dissolved	08/27/2021			08/27/2021 15:17	James L Waggeberby	2272356
	08/27/2021			08/27/2021 15:24	James L Waggeberby	2272350
	08/27/2021			08/27/2021 15:26	James L Waggeberby	2272355
SM 2320 B-2011	08/27/2021			08/30/2021 20:03	Dale L. Simmons	2272348
	08/27/2021			09/01/2021 19:39	Dale L. Simmons	2272352
	08/27/2021			09/01/2021 20:09	Dale L. Simmons	2272351
SM 2540 D-2011	08/27/2021			08/30/2021 14:36	Yijie Li	2272348, 2272351, 2272352
SM 4500 F-C-2011	08/27/2021			08/30/2021 20:03	Dale L. Simmons	2272348
	08/27/2021			09/01/2021 18:07	Dale L. Simmons	2272352
	08/27/2021			09/01/2021 19:11	Dale L. Simmons	2272351
SM 5310 B-2011	08/27/2021			08/31/2021 10:58	Touraj Touran	2272353
	08/27/2021			09/02/2021 06:08	Touraj Touran	2272349
	08/27/2021			09/11/2021 00:41	Madeline Gruver	2272354