

Chemical Analysis Report

CEN-DIST-2020-08-13-02

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

Event Description: **Marshall + Blank**
Request ID: **RQ-2020-08-10-60**
Customer: **CEN-DIST**
Project ID: **SMP**

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

Date Certified: 03-SEP-2020 13:15

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular 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: Marshall Lake @ Center

Collection Date/Time: 08/12/2020 11:32

Field ID: G1CE0110

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2190173	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P386010	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P386274	
		Sulfate	14		mg SO4/L	P386278	
		Color (true)	38	A	PCU	P386021	
	SM 2320 B-2011	Total Alkalinity	47		mg CaCO3/L	P386118	
	SM 2540 C-2011	TDS	119		mg/L	P386373	
	SM 2540 D-2011	TSS	3	I	mg/L	P386185	
	SM 4500 F-C-2011	Fluoride	0.074	I	mg F/L	P386122	
2190174	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P386100	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P386308	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P386036	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P386055	
	SM 5310 B-2011	Organic Carbon	13		mg C/L	P386259	
2190175	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386018	
2190181	EPA 200.7 Rev. 4.4	Barium	12.0		ug/L	P386012	
		Calcium	20.5		mg/L	P386012	
		Iron	30	U	ug/L	P386012	
		Magnesium	3.62		mg/L	P386012	
		Potassium	3.6		mg/L	P386012	
		Sodium	8.1		mg/L	P386012	
		Zinc	5.0	U	ug/L	P386012	
	EPA 200.8 Rev. 5.4	Aluminum	8.9	I	ug/L	P386012	
		Antimony	0.17	I	ug/L	P386012	
		Arsenic	1.29		ug/L	P386012	
		Boron**	37.3		ug/L	P386012	
		Cadmium	0.020	U	ug/L	P386012	
		Chromium	0.40	U	ug/L	P386012	
		Copper	0.40	U	ug/L	P386012	
		Lead	0.20	U	ug/L	P386012	
		Nickel	0.50	U	ug/L	P386012	
		Selenium	0.20	U	ug/L	P386012	
		Silver	0.010	U	ug/L	P386012	
		Thallium	0.10	U	ug/L	P386012	
		Hardness	66.0		mg/L	P386012	
	SM 2340B						

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: FB 081220

Collection Date/Time: 08/12/2020 11:49

Field ID: FB 081220

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2190176	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P386010	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P386274	
		Sulfate	0.20	U	mg SO4/L	P386278	
		Color (true)	2.5	U	PCU	P386021	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P386118	
	SM 2540 C-2011	TDS	15	U	mg/L	P386373	
	SM 2540 D-2011	TSS	2	U	mg/L	P386185	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P386122	
2190177	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P386100	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P386308	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P386036	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P386055	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P386259	
2190178	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386018	
2190182	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P386012	
		Calcium	0.075	U	mg/L	P386012	
		Iron	30	U	ug/L	P386012	
		Magnesium	0.040	U	mg/L	P386012	
		Potassium	0.30	U	mg/L	P386012	
		Sodium	0.50	U	mg/L	P386012	
		Zinc	5.0	U	ug/L	P386012	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P386012	
		Antimony	0.050	U	ug/L	P386012	
		Arsenic	0.050	U	ug/L	P386012	
		Boron**	2.0	U	ug/L	P386012	
		Cadmium	0.020	U	ug/L	P386012	
		Chromium	0.40	U	ug/L	P386012	
		Copper	0.40	U	ug/L	P386012	
		Lead	0.20	U	ug/L	P386012	
		Nickel	0.50	U	ug/L	P386012	
		Selenium	0.20	U	ug/L	P386012	
		Silver	0.010	U	ug/L	P386012	
		Thallium	0.10	U	ug/L	P386012	
		Hardness	0.35	U	mg/L	P386012	
	SM 2340B						

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: P386010

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386012

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386012

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: P386274

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386278

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386100

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386308

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386036

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386055

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386018

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

Reference Method: SM 2120 B-2011
Batch ID: P386021

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P386118

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

Reference Method: SM 2540 C-2011
Batch ID: P386373

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P386185

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P386122

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P386259

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: P386012

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	105		P	85 - 115
Iron	106		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	101		P	85 - 115
Sodium	101		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386012

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	109		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	103		P	85 - 115
Boron	98.9		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	104		P	85 - 115
Copper	103		P	85 - 115
Lead	106		P	85 - 115
Nickel	103		P	85 - 115
Selenium	104		P	85 - 115
Silver	104		P	85 - 115
Thallium	105		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386274

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386278

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386100

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386308

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386036

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386055

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386018

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

Reference Method: SM 2120 B-2011
Batch ID: P386021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P386118

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P386122

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P386259

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386012

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190181	Barium	105		P	80 - 120
2190181	Calcium	106		P	80 - 120
2190181	Iron	110		P	80 - 120
2190181	Magnesium	110		P	80 - 120
2190181	Potassium	103		P	80 - 120
2190181	Sodium	101		P	80 - 120
2190181	Zinc	109		P	80 - 120
2190277	Barium	105	105	P/P	80 - 120
2190277	Calcium	105		P	80 - 120
2190277	Iron	110	109	P/P	80 - 120
2190277	Magnesium	109	107	P/P	80 - 120
2190277	Potassium	103	101	P/P	80 - 120
2190277	Sodium	100		P	80 - 120
2190277	Zinc	106	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386012

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190181	Aluminum	103		P	80 - 120
2190181	Antimony	108		P	80 - 120
2190181	Arsenic	106		P	80 - 120
2190181	Boron	103		P	80 - 120
2190181	Cadmium	104		P	80 - 120
2190181	Chromium	107		P	80 - 120
2190181	Copper	105		P	80 - 120
2190181	Lead	109		P	80 - 120
2190181	Nickel	105		P	80 - 120
2190181	Selenium	102		P	80 - 120
2190181	Silver	105		P	80 - 120
2190181	Thallium	111		P	80 - 120
2190277	Aluminum	106	107	P/P	80 - 120
2190277	Antimony	107	107	P/P	80 - 120
2190277	Arsenic	105	104	P/P	80 - 120
2190277	Boron	101	102	P/P	80 - 120
2190277	Cadmium	104	105	P/P	80 - 120
2190277	Chromium	107	108	P/P	80 - 120
2190277	Copper	106	107	P/P	80 - 120
2190277	Lead	107	109	P/P	80 - 120
2190277	Nickel	104	105	P/P	80 - 120
2190277	Selenium	100	101	P/P	80 - 120
2190277	Silver	106	106	P/P	80 - 120
2190277	Thallium	108	111	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190038	Chloride	97.4		P	90 - 110
2190131	Chloride	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386278

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190038	Sulfate	101		P	90 - 110
2190131	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386100

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190129	Ammonia-N	99.2	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386308

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190151	Kjeldahl Nitrogen	92.3	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386036

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190151	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386055

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190114	Total-P	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386018

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190152	O-Phosphate-P	98.6	98.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P386122

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190150	Fluoride	100	101	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P386259

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190174	Organic Carbon	97.8	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386010

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190039	Turbidity	2.33	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190277	Barium	0.152	Spike	P	0 - 20
2190277	Calcium	0.282	Spike	P	0 - 20
2190277	Iron	1.32	Spike	P	0 - 20
2190277	Magnesium	1.24	Spike	P	0 - 20
2190277	Potassium	0.930	Spike	P	0 - 20
2190277	Sodium	0.329	Spike	P	0 - 20
2190277	Zinc	0.491	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190277	Aluminum	0.552	Spike	P	0 - 20
2190277	Antimony	0.0168	Spike	P	0 - 20
2190277	Arsenic	0.615	Spike	P	0 - 20
2190277	Boron	1.36	Spike	P	0 - 20
2190277	Cadmium	1.21	Spike	P	0 - 20
2190277	Chromium	1.71	Spike	P	0 - 20
2190277	Copper	0.788	Spike	P	0 - 20
2190277	Lead	1.28	Spike	P	0 - 20
2190277	Nickel	1.45	Spike	P	0 - 20
2190277	Selenium	0.692	Spike	P	0 - 20
2190277	Silver	0.205	Spike	P	0 - 20
2190277	Thallium	2.43	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386274

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190038	Chloride	0.164	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386278

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190038	Sulfate	0.556	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190129	Ammonia-N	4.74	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386308

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190151	Kjeldahl Nitrogen	5.61	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386036

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190151	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190114	Total-P	0.886	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386018

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190152	O-Phosphate-P	0.203	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P386021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190173	Color (true)	1.12	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P386118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190150	Total Alkalinity	3.11	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P386373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190050	TDS	0.858	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P386122

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190150	Fluoride	0.454	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P386259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190174	Organic Carbon	0.839	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: A100446

Included Lab Sample IDs: 2190173, 2190176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100450

Included Lab Sample IDs: 2190175, 2190178

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.5	P/P	90 - 110
O-Phosphate-P	99.8	100	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A100451

Included Lab Sample IDs: 2190173, 2190176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	104	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100462

Included Lab Sample IDs: 2190174, 2190177

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: A100481

Included Lab Sample IDs: 2190181, 2190182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	104	P/P	90 - 110
Barium	104	103	P/P	90 - 110
Calcium	102	104	P/P	90 - 110
Calcium	104	105	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Iron	103	105	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Potassium	98.9	99.1	P/P	90 - 110
Potassium	99.1	100	P/P	90 - 110
Sodium	98.4	99.6	P/P	90 - 110
Sodium	99.4	98.4	P/P	90 - 110
Zinc	103	106	P/P	90 - 110
Zinc	106	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100489

Included Lab Sample IDs: 2190174, 2190177

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-2011

Run ID: A100491

Included Lab Sample IDs: 2190173, 2190176

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.0	99.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A100491

Included Lab Sample IDs: 2190173, 2190176

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100502

Included Lab Sample IDs: 2190174, 2190177

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

Reference Method: SM 5310 B-2011

Run ID: A100535

Included Lab Sample IDs: 2190174, 2190177

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.4	97.9	P/P	90 - 110
Organic Carbon	97.9	97.1	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A100543

Included Lab Sample IDs: 2190173, 2190176

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100590

Included Lab Sample IDs: 2190174, 2190177

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.0	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100601

Included Lab Sample IDs: 2190181, 2190182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	107	108	P/P	90 - 110
Antimony	108	108	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Arsenic	103	102	P/P	90 - 110
Boron	101	104	P/P	90 - 110
Boron	99.9	101	P/P	90 - 110
Cadmium	101	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100601

Included Lab Sample IDs: 2190181, 2190182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	103	102	P/P	90 - 110
Chromium	100	102	P/P	90 - 110
Chromium	101	100	P/P	90 - 110
Copper	98.8	98.3	P/P	90 - 110
Copper	99.7	98.8	P/P	90 - 110
Lead	103	104	P/P	90 - 110
Lead	103	103	P/P	90 - 110
Nickel	100	99.8	P/P	90 - 110
Nickel	101	100	P/P	90 - 110
Selenium	102	101	P/P	90 - 110
Selenium	102	102	P/P	90 - 110
Silver	105	105	P/P	90 - 110
Silver	105	105	P/P	90 - 110
Thallium	102	101	P/P	90 - 110
Thallium	102	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100621

Included Lab Sample IDs: 2190181, 2190182

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	103	P/P	90 - 110
Aluminum	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			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					2.33	
EPA 200.7 Rev. 4.4	Barium	102	105	105	105		0.152
	Calcium	105	106	105			0.282
	Iron	106	110	110	109		1.32
	Magnesium	107	110	109	107		1.24
	Potassium	101	103	103	101		0.930
	Sodium	101	101	100			0.329
	Zinc	104	109	106	106		0.491
EPA 200.8 Rev. 5.4	Aluminum	109	106	107	103		0.552
	Antimony	104	107	107	108		0.0168
	Arsenic	103	105	104	106		0.615
	Boron	98.9	101	102	103		1.36
	Cadmium	103	104	105	104		1.21
	Chromium	104	107	108	107		1.71
	Copper	103	106	107	105		0.788
	Lead	106	107	109	109		1.28
	Nickel	103	104	105	105		1.45
	Selenium	104	100	101	102		0.692
	Silver	104	106	106	105		0.205
	Thallium	105	108	111	111		2.43
EPA 300.0 Rev. 2.1	Chloride	98.7	97.4	101		0.164	
	Sulfate	101	101	102		0.556	
EPA 350.1 Rev. 2.0	Ammonia-N	98.0	99.2	105			4.74
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	92.3	100			5.61
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	101	101	100			0.886
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.6	98.8			0.203
SM 2120 B-2011	Color (true)	102				1.12	
SM 2320 B-2011	Total Alkalinity	100				3.11	
SM 2540 C-2011	TDS					0.858	
SM 4500 F-C-2011	Fluoride	101	100	101			0.454
SM 5310 B-2011	Organic Carbon	97.9	97.8	96.4			0.839

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2190173, 2190176
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2190181, 2190182
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2190181, 2190182
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2190173, 2190176
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2190173, 2190176
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2190174, 2190177
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2190174, 2190177
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2190174, 2190177
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2190174, 2190177
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2190175, 2190178
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2190173, 2190176
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2190173, 2190176
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2190181, 2190182
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2190173, 2190176

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2190173, 2190176
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2190173, 2190176
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2190174, 2190177

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	08/13/2020			08/13/2020 14:55	Yen Ta	2190173, 2190176
EPA 200.7 Rev. 4.4	08/13/2020	08/13/2020 16:35	Elliott D. Healy	08/14/2020 17:30	Betina Topolski	2190182
	08/13/2020	08/13/2020 16:35	Elliott D. Healy	08/14/2020 19:22	Betina Topolski	2190181
EPA 200.8 Rev. 5.4	08/13/2020	08/13/2020 16:35	Elliott D. Healy	08/21/2020 12:26	Alexander Thompson	2190182
	08/13/2020	08/13/2020 16:35	Elliott D. Healy	08/21/2020 14:51	Alexander Thompson	2190181
	08/13/2020	08/13/2020 16:35	Elliott D. Healy	08/24/2020 15:28	Alexander Thompson	2190182
	08/13/2020	08/13/2020 16:35	Elliott D. Healy	08/24/2020 16:54	Alexander Thompson	2190181
EPA 300.0 Rev. 2.1	08/13/2020			08/18/2020 11:22	Julia Storbeck	2190173
	08/13/2020			08/18/2020 11:34	Julia Storbeck	2190176
EPA 350.1 Rev. 2.0	08/13/2020			08/16/2020 15:09	Ping Hua	2190174
	08/13/2020			08/16/2020 15:11	Ping Hua	2190177
EPA 351.2 Rev. 2.0	08/13/2020	08/20/2020 10:05	Sima Feizi	08/21/2020 11:35	Jhamieka S. Greenwood	2190174
	08/13/2020	08/20/2020 10:05	Sima Feizi	08/21/2020 11:37	Jhamieka S. Greenwood	2190177
EPA 353.2 Rev. 2.0	08/13/2020			08/14/2020 09:25	Beverly Y. Sanders	2190174
	08/13/2020			08/14/2020 09:26	Beverly Y. Sanders	2190177
EPA 365.1 Rev. 2.0	08/13/2020	08/14/2020 12:15	Shengyu Wang	08/18/2020 08:56	Lipi Saha	2190174
	08/13/2020	08/14/2020 12:15	Shengyu Wang	08/18/2020 08:57	Lipi Saha	2190177
EPA 365.1 Rev. 2.0 dissolved	08/13/2020			08/13/2020 16:00	Samantha Davila	2190175
	08/13/2020			08/13/2020 16:05	Samantha Davila	2190178
SM 2120 B-2011	08/13/2020			08/13/2020 15:18	Madeline Gruver	2190173
	08/13/2020			08/13/2020 15:19	Madeline Gruver	2190176
SM 2320 B-2011	08/13/2020			08/14/2020 23:27	Dale L. Simmons	2190173
	08/13/2020			08/14/2020 23:36	Dale L. Simmons	2190176
SM 2340B	08/13/2020			08/14/2020 17:30	Betina Topolski	2190182
	08/13/2020			08/14/2020 19:22	Betina Topolski	2190181
SM 2540 C-2011	08/13/2020			08/14/2020 17:50	Madeline Gruver	2190173, 2190176
SM 2540 D-2011	08/13/2020			08/14/2020 17:50	Madeline Gruver	2190173, 2190176
SM 4500 F-C-2011	08/13/2020			08/14/2020 23:27	Dale L. Simmons	2190173
	08/13/2020			08/14/2020 23:36	Dale L. Simmons	2190176
SM 5310 B-2011	08/13/2020			08/19/2020 00:09	David Boose	2190174
	08/13/2020			08/19/2020 01:58	David Boose	2190177