

Chemical Analysis Report

NW-DIST-2020-07-23-01

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

Event Description: **Highway 4 Run**
Request ID: **RQ-2020-07-20-56**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

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Date Certified: 12-AUG-2020 11:37



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: Bucket Branch end of Bucket Creek Rd

Collection Date/Time: 07/22/2020 10:30

Field ID: G4NW0059

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2185027	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P385087	
	EPA 300.0 Rev. 2.1	Chloride	4.6		mg Cl/L	P385319	
		Sulfate	0.83		mg SO4/L	P385323	
	SM 2120 B-2011	Color (true)	100	A	PCU	P385093	
	SM 2320 B-2011	Total Alkalinity	4.2		mg CaCO3/L	P385166	
	SM 2540 C-2011	TDS	48		mg/L	P385362	
	SM 2540 D-2011	TSS	2	I	mg/L	P385511	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P385169	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P385146	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P385340	MS
2185029	EPA 353.2 Rev. 2.0	NO2NO3-N	0.047		mg N/L	P385109	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P385343	
	SM 5310 B-2011	Organic Carbon	9.7		mg C/L	P385263	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.005	I	mg P/L	P385083	
	dissolved						

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: Big Coldwater Creek (east fork) upstream of Springhill Rd

Collection Date/Time: 07/22/2020 11:10

Field ID: G4NW0434

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2185028	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P385087	
	EPA 300.0 Rev. 2.1	Chloride	3.3		mg Cl/L	P385319	
		Sulfate	0.83		mg SO4/L	P385323	
	SM 2120 B-2011	Color (true)	21		PCU	P385093	
	SM 2320 B-2011	Total Alkalinity	1.6	I	mg CaCO3/L	P385166	
	SM 2540 C-2011	TDS	25		mg/L	P385362	
	SM 2540 D-2011	TSS	2	I	mg/L	P385511	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P385169	
2185030	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P385146	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.12	I	mg N/L	P385340	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.27		mg N/L	P385109	
	EPA 365.1 Rev. 2.0	Total-P	0.005	I	mg P/L	P385343	
	SM 5310 B-2011	Organic Carbon	2.2		mg C/L	P385263	
2185032	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P385083	

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: Bear Creek @ Forest Rd. 0.7 Miles West of Bear Lake **Collection Date/Time: 07/22/2020 12:45**

Field ID: G4NW0380

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2185024	EPA 180.1 Rev. 2.0	Turbidity	15	A	NTU	P385087	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P385319	
		Sulfate	0.46	I	mg SO4/L	P385323	
	SM 2120 B-2011	Color (true)	29	A	PCU	P385096	
	SM 2320 B-2011	Total Alkalinity	9.6		mg CaCO3/L	P385166	
	SM 2540 C-2011	TDS	34		mg/L	P385362	
	SM 2540 D-2011	TSS	3	I	mg/L	P385511	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P385169	
2185025	EPA 350.1 Rev. 2.0	Ammonia-N	0.027		mg N/L	P385146	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29		mg N/L	P385340	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.019		mg N/L	P385109	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P385343	
	SM 5310 B-2011	Organic Carbon	3.9		mg C/L	P385263	
2185026	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P385083	
2185040	EPA 200.7 Rev. 4.4	Barium	16.2		ug/L	P385268	
		Calcium	3.06		mg/L	P385268	
		Iron	2.54E+03		ug/L	P385268	
		Magnesium	1.18		mg/L	P385268	
		Potassium	0.30	U	mg/L	P385268	
		Sodium	1.8	I	mg/L	P385268	
		Zinc	5.0	U	ug/L	P385268	
	EPA 200.8 Rev. 5.4	Aluminum	34		ug/L	P385268	
		Antimony	0.050	U	ug/L	P385268	
		Arsenic	0.88		ug/L	P385268	
		Boron**	8.7		ug/L	P385268	
		Cadmium	0.020	U	ug/L	P385268	
		Chromium	0.40	U	ug/L	P385268	
		Copper	0.40	U	ug/L	P385268	
		Lead	0.20	U	ug/L	P385268	
		Nickel	0.50	U	ug/L	P385268	
		Selenium	0.20	U	ug/L	P385268	
		Silver	0.010	U	ug/L	P385268	
		Thallium	0.10	U	ug/L	P385268	
		Hardness	12.5		mg/L	P385268	
	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: P385087

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385268

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: P385268

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: P385319

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385323

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385146

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: P385340

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385109

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385343

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385083

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

Reference Method: SM 2120 B-2011
Batch ID: P385093

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P385096

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P385166

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

Reference Method: SM 2540 C-2011
Batch ID: P385362

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P385511

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P385169

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P385263

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: P385268

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	101		P	85 - 115
Iron	106		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	102		P	85 - 115
Sodium	102		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385268

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.3		P	85 - 115
Antimony	99.1		P	85 - 115
Arsenic	97.8		P	85 - 115
Boron	102		P	85 - 115
Cadmium	96.2		P	85 - 115
Chromium	96.6		P	85 - 115
Copper	100		P	85 - 115
Lead	101		P	85 - 115
Nickel	97.9		P	85 - 115
Selenium	95.0		P	85 - 115
Silver	109		P	85 - 115
Thallium	99.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385319

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385323

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385146

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385340

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385109

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385343

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385083

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

Reference Method: SM 2120 B-2011
Batch ID: P385093

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.7		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P385096

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P385166

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

Reference Method: SM 4500 F-C-2011
Batch ID: P385169

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P385263

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P385268

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2185215	Barium	107	106	P/P	80 - 120
2185215	Calcium	102		P	80 - 120
2185215	Iron	104	107	P/P	80 - 120
2185215	Magnesium	104		P	80 - 120
2185215	Potassium	102	107	P/P	80 - 120
2185215	Sodium	103		P	80 - 120
2185215	Zinc	108	106	P/P	80 - 120
2185566	Barium	106		P	80 - 120
2185566	Calcium	101		P	80 - 120
2185566	Iron	107		P	80 - 120
2185566	Magnesium	110		P	80 - 120
2185566	Potassium	107		P	80 - 120
2185566	Sodium	106		P	80 - 120
2185566	Zinc	106		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P385268

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2185215	Aluminum	95.5	93.9	P/P	80 - 120
2185215	Antimony	101	100	P/P	80 - 120
2185215	Arsenic	100	98.7	P/P	80 - 120
2185215	Boron	106	105	P/P	80 - 120
2185215	Cadmium	97.8	96.4	P/P	80 - 120
2185215	Chromium	101	99.6	P/P	80 - 120
2185215	Copper	99.9	98.6	P/P	80 - 120
2185215	Lead	103	102	P/P	80 - 120
2185215	Nickel	96.8	96.0	P/P	80 - 120
2185215	Selenium	94.2	92.8	P/P	80 - 120
2185215	Silver	106	107	P/P	80 - 120
2185215	Thallium	103	104	P/P	80 - 120
2185566	Aluminum	94.9		P	80 - 120
2185566	Antimony	94.8		P	80 - 120
2185566	Arsenic	96.1		P	80 - 120
2185566	Boron	106		P	80 - 120
2185566	Cadmium	97.1		P	80 - 120
2185566	Chromium	101		P	80 - 120
2185566	Copper	100		P	80 - 120
2185566	Lead	101		P	80 - 120
2185566	Nickel	95.2		P	80 - 120
2185566	Selenium	88.8		P	80 - 120
2185566	Silver	109		P	80 - 120
2185566	Thallium	101		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P385319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2184885	Chloride	101		P	90 - 110
2185149	Chloride	98.4		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385323

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2184885	Sulfate	99.4		P	90 - 110
2185149	Sulfate	99.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385146

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2184891	Ammonia-N	98.2	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385340

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2185049	Kjeldahl Nitrogen	112	101	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2185018	NO2NO3-N	98.2	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2184872	Total-P	107	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2185032	O-Phosphate-P	99.5	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P385169

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2185105	Fluoride	99.5	98.9	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P385263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2185076	Organic Carbon	95.3	97.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P385087

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185024	Turbidity	1.35	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185215	Barium	0.412	Spike	P	0 - 20
2185215	Calcium	1.50	Spike	P	0 - 20
2185215	Iron	2.50	Spike	P	0 - 20
2185215	Magnesium	2.10	Spike	P	0 - 20
2185215	Potassium	3.06	Spike	P	0 - 20
2185215	Sodium	1.97	Spike	P	0 - 20
2185215	Zinc	1.41	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185215	Aluminum	1.65	Spike	P	0 - 20
2185215	Antimony	0.698	Spike	P	0 - 20
2185215	Arsenic	1.25	Spike	P	0 - 20
2185215	Boron	0.864	Spike	P	0 - 20
2185215	Cadmium	1.47	Spike	P	0 - 20
2185215	Chromium	1.54	Spike	P	0 - 20
2185215	Copper	1.21	Spike	P	0 - 20
2185215	Lead	0.361	Spike	P	0 - 20
2185215	Nickel	0.833	Spike	P	0 - 20
2185215	Selenium	1.47	Spike	P	0 - 20
2185215	Silver	0.900	Spike	P	0 - 20
2185215	Thallium	0.526	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185149	Chloride	0.475	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385323

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185149	Sulfate	0.115	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385146

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2184891	Ammonia-N	0.153	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385340

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185049	Kjeldahl Nitrogen	6.73	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185018	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385343

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2184872	Total-P	0.101	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185032	O-Phosphate-P	0.900	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P385093

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185027	Color (true)	1.51	Sample	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P385096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185024	Color (true)	2.15	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P385166

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185105	Total Alkalinity	1.81	Sample	P	0 - 8.1

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P385362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185056	TDS	0.664	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P385169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185105	Fluoride	0.474	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P385263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2185076	Organic Carbon	1.75	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: A100045

Included Lab Sample IDs: 2185026, 2185031, 2185032

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	97.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A100046

Included Lab Sample IDs: 2185024, 2185027, 2185028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A100048

Included Lab Sample IDs: 2185024, 2185027, 2185028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	100	P/P	90 - 115
Color (true)	102	103	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100058

Included Lab Sample IDs: 2185025, 2185029, 2185030

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100073

Included Lab Sample IDs: 2185025, 2185029, 2185030

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

Reference Method: SM 2320 B-2011

Run ID: A100080

Included Lab Sample IDs: 2185024, 2185027, 2185028

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

Reference Method: SM 4500 F-C-2011

Run ID: A100080

Included Lab Sample IDs: 2185024, 2185027, 2185028

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

Reference Method: SM 5310 B-2011

Run ID: A100127

Included Lab Sample IDs: 2185025, 2185029, 2185030

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	96.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A100152

Included Lab Sample IDs: 2185024, 2185027, 2185028

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	101	P/P	90 - 110
Sulfate	101	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100154

Included Lab Sample IDs: 2185025, 2185029, 2185030

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A100158

Included Lab Sample IDs: 2185040

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	103	P/P	90 - 110
Calcium	101	100	P/P	90 - 110
Iron	103	102	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	102	103	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100253

Included Lab Sample IDs: 2185025, 2185029, 2185030

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100326

Included Lab Sample IDs: 2185040

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.3	94.6	P/P	90 - 110
Antimony	96.0	94.7	P/P	90 - 110
Arsenic	96.5	93.5	P/P	90 - 110
Boron	95.7	101	P/P	90 - 110
Cadmium	93.6	93.3	P/P	90 - 110
Chromium	93.9	95.4	P/P	90 - 110
Copper	98.0	96.3	P/P	90 - 110
Lead	96.8	95.6	P/P	90 - 110
Nickel	96.5	95.6	P/P	90 - 110
Selenium	94.4	92.5	P/P	90 - 110
Silver	104	104	P/P	90 - 110
Thallium	95.4	94.8	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					1.35	
EPA 200.7 Rev. 4.4	Barium	102	107	106	106		0.412
	Calcium	101	102	101			1.50
	Iron	106	104	107	107		2.50
	Magnesium	102	104	110			2.10
	Potassium	102	102	107	107		3.06
	Sodium	102	103	106			1.97
	Zinc	103	108	106	106		1.41
EPA 200.8 Rev. 5.4	Aluminum	96.3	95.5	93.9	94.9		1.65
	Antimony	99.1	101	100	94.8		0.698
	Arsenic	97.8	100	98.7	96.1		1.25
	Boron	102	106	105	106		0.864
	Cadmium	96.2	97.8	96.4	97.1		1.47
	Chromium	96.6	101	99.6	101		1.54
	Copper	100	99.9	98.6	100		1.21
	Lead	101	103	102	101		0.361
	Nickel	97.9	96.8	96.0	95.2		0.833
	Selenium	95.0	94.2	92.8	88.8		1.47
	Silver	109	106	107	109		0.900
	Thallium	99.4	103	104	101		0.526
EPA 300.0 Rev. 2.1	Chloride	102	98.4	101		0.475	
	Sulfate	99.5	99.0	99.4		0.115	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	98.2	98.0			0.153
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	112	101			6.73
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.2	98.2			0.0
EPA 365.1 Rev. 2.0	Total-P	102	107	108			0.101
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	99.5	100			0.900
SM 2120 B-2011	Color (true)	99.7				1.51	
	Color (true)	101				2.15	
SM 2320 B-2011	Total Alkalinity	101				1.81	
SM 2540 C-2011	TDS					0.664	
SM 4500 F-C-2011	Fluoride	98.2	99.5	98.9			0.474
SM 5310 B-2011	Organic Carbon	96.8	95.3	97.1			1.75

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2185024, 2185027, 2185028
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2185040
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2185040
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2185024, 2185027, 2185028
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2185024, 2185027, 2185028
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2185025, 2185029, 2185030
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2185025, 2185029, 2185030
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2185025, 2185029, 2185030
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2185025, 2185029, 2185030
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2185026, 2185031, 2185032
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2185024, 2185027, 2185028
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2185024, 2185027, 2185028
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2185040

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2185024, 2185027, 2185028
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2185024, 2185027, 2185028
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2185024, 2185027, 2185028
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2185025, 2185029, 2185030

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	07/23/2020			07/23/2020 16:01	Samantha Davila	2185024, 2185027, 2185028
EPA 200.7 Rev. 4.4	07/23/2020	07/28/2020 15:30	Elliott D. Healy	07/29/2020 17:12	Betina Topolski	2185040
EPA 200.8 Rev. 5.4	07/23/2020	07/28/2020 15:30	Elliott D. Healy	08/06/2020 15:08	Alexander Thompson	2185040
EPA 300.0 Rev. 2.1	07/23/2020			07/29/2020 09:43	Julia Storbeck	2185024
	07/23/2020			07/29/2020 09:55	Julia Storbeck	2185027
	07/23/2020			07/29/2020 10:07	Julia Storbeck	2185028
EPA 350.1 Rev. 2.0	07/23/2020			07/25/2020 14:10	Ping Hua	2185025
	07/23/2020			07/25/2020 14:11	Ping Hua	2185029
	07/23/2020			07/25/2020 14:12	Ping Hua	2185030
EPA 351.2 Rev. 2.0	07/23/2020	07/27/2020 10:40	Jhamieka S. Greenwood	07/29/2020 15:57	Jhamieka S. Greenwood	2185025
	07/23/2020	07/27/2020 10:40	Jhamieka S. Greenwood	07/29/2020 15:59	Jhamieka S. Greenwood	2185029
	07/23/2020	07/27/2020 10:40	Jhamieka S. Greenwood	07/29/2020 16:00	Jhamieka S. Greenwood	2185030
EPA 353.2 Rev. 2.0	07/23/2020			07/24/2020 08:23	Beverly Y. Sanders	2185025
	07/23/2020			07/24/2020 08:24	Beverly Y. Sanders	2185029
	07/23/2020			07/24/2020 08:25	Beverly Y. Sanders	2185030
EPA 365.1 Rev. 2.0	07/23/2020	07/30/2020 11:20	Lipi Saha	08/03/2020 12:36	Benjamin T. Nordmann	2185025
	07/23/2020	07/30/2020 11:20	Lipi Saha	08/03/2020 12:37	Benjamin T. Nordmann	2185029
	07/23/2020	07/30/2020 11:20	Lipi Saha	08/03/2020 12:38	Benjamin T. Nordmann	2185030
EPA 365.1 Rev. 2.0 dissolved	07/23/2020			07/23/2020 14:14	Jhamieka S. Greenwood	2185032
	07/23/2020			07/23/2020 14:18	Jhamieka S. Greenwood	2185026
	07/23/2020			07/23/2020 14:19	Jhamieka S. Greenwood	2185031
SM 2120 B-2011	07/23/2020			07/23/2020 15:29	Blanca Fach	2185028
	07/23/2020			07/23/2020 16:01	Blanca Fach	2185024, 2185027
SM 2320 B-2011	07/23/2020			07/24/2020 18:22	Dale L. Simmons	2185024
	07/23/2020			07/24/2020 18:33	Dale L. Simmons	2185027
	07/23/2020			07/24/2020 18:42	Dale L. Simmons	2185028
SM 2340B	07/23/2020			07/29/2020 17:12	Betina Topolski	2185040
SM 2540 C-2011	07/23/2020			07/24/2020 18:55	Madeline Gruver	2185024, 2185027, 2185028
SM 2540 D-2011	07/23/2020			07/28/2020 18:00	Madeline Gruver	2185024, 2185027, 2185028
SM 4500 F-C-2011	07/23/2020			07/24/2020 18:22	Dale L. Simmons	2185024
	07/23/2020			07/24/2020 18:33	Dale L. Simmons	2185027
	07/23/2020			07/24/2020 18:42	Dale L. Simmons	2185028
SM 5310 B-2011	07/23/2020			07/28/2020 08:28	David Boose	2185025
	07/23/2020			07/28/2020 08:40	David Boose	2185029
	07/23/2020			07/28/2020 08:53	David Boose	2185030