

Chemical Analysis Report

NE-DIST-2020-03-03-01

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

Event Description: **Callahan 2020**
Request ID: **RQ-2020-02-24-12**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 24-MAR-2020 12:02

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the "T" and a long horizontal stroke at the end.

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: Alligator Cr at Hobbs Landing

Collection Date/Time: 03/02/2020 09:50

Field ID: G4NE0280

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2161732	EPA 180.1 Rev. 2.0	Turbidity	5.4		NTU	P380008	
	EPA 300.0 Rev. 2.1	Chloride	24	A	mg Cl/L	P380342	
		Sulfate	8.1	A	mg SO4/L	P380344	
		Color (true)	350		PCU	P380003	
	SM 2120 B-2011	Total Alkalinity	28		mg CaCO3/L	P380270	
	SM 2540 C-2011	TDS	142		mg/L	P380542	
	SM 2540 D-2011	TSS	4	I	mg/L	P380423	
	SM 4500 F-C-2011	Fluoride	0.064	I	mg F/L	P380274	
2161734	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P380072	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P380114	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P380238	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P380307	
	SM 5310 B-2011	Organic Carbon	32		mg C/L	P380276	
2161736	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.061		mg P/L	P379983	MS
2161752	EPA 200.7 Rev. 4.4	Barium	18.8		ug/L	P379953	
		Calcium	12.1		mg/L	P379953	
		Iron	700		ug/L	P379953	
		Magnesium	5.03		mg/L	P379953	
		Potassium	2.5		mg/L	P379953	
		Sodium	16.3		mg/L	P379953	
		Zinc	5.0	U	ug/L	P379953	
	EPA 200.8 Rev. 5.4	Aluminum	516		ug/L	P379953	
		Antimony	0.069	I	ug/L	P379953	
		Arsenic	0.59		ug/L	P379953	
		Boron**	23.2		ug/L	P379953	
		Cadmium	0.020	U	ug/L	P379953	
		Chromium	1.1	I	ug/L	P379953	
		Copper	0.88		ug/L	P379953	
		Lead	0.42		ug/L	P379953	
		Nickel	0.62	I	ug/L	P379953	
		Selenium	0.21	I	ug/L	P379953	
		Silver	0.010	U	ug/L	P379953	
		Thallium	0.10	U	ug/L	P379953	
	SM 2340B	Hardness	51.0		mg/L	P379953	

Sample Location: Alligator Cr at Hobbs Landing

Collection Date/Time: 03/02/2020 09:55

Field ID: G4NE0280 DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2161733	EPA 180.1 Rev. 2.0	Turbidity	5.4		NTU	P380008	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P380342	
		Sulfate	8.1		mg SO4/L	P380344	
		Color (true)	350		PCU	P380003	
	SM 2120 B-2011	Total Alkalinity	28		mg CaCO3/L	P380270	
	SM 2540 C-2011	TDS	139	A	mg/L	P380544	
	SM 2540 D-2011	TSS	4	I	mg/L	P380424	
	SM 4500 F-C-2011	Fluoride	0.067	I	mg F/L	P380274	
2161735	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P380072	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P380114	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P380238	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P380307	
	SM 5310 B-2011	Organic Carbon	33		mg C/L	P380276	
2161737	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.061		mg P/L	P379983	MS
2161753	EPA 200.7 Rev. 4.4	Barium	18.6		ug/L	P379953	
		Calcium	12.1		mg/L	P379953	
		Iron	730		ug/L	P379953	
		Magnesium	5.10		mg/L	P379953	
		Potassium	2.4		mg/L	P379953	
		Sodium	16.3		mg/L	P379953	
		Zinc	5.0	U	ug/L	P379953	
	EPA 200.8 Rev. 5.4	Aluminum	561		ug/L	P379953	
		Antimony	0.071	I	ug/L	P379953	
		Arsenic	0.59		ug/L	P379953	
		Boron**	22.7		ug/L	P379953	
		Cadmium	0.020	U	ug/L	P379953	
		Chromium	1.0	I	ug/L	P379953	
		Copper	0.94		ug/L	P379953	
		Lead	0.44		ug/L	P379953	
		Nickel	0.61	I	ug/L	P379953	
		Selenium	0.21	I	ug/L	P379953	
		Silver	0.010	U	ug/L	P379953	
		Thallium	0.10	U	ug/L	P379953	
		Hardness	51.3		mg/L	P379953	

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: Alligator Cr at Hobbs Landing

Collection Date/Time: 03/02/2020 10:00

Field ID: FB 02272020

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2161738	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P380008	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P380342	
		Sulfate	0.20	U	mg SO4/L	P380344	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P380003	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P380270	
	SM 2540 C-2011	TDS	15	U	mg/L	P380540	
	SM 2540 D-2011	TSS	2	U	mg/L	P380421	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P380274	
2161739	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P380072	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.11	I	mg N/L	P380114	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.39		mg N/L	P380238	
	EPA 365.1 Rev. 2.0	Total-P	0.008		mg P/L	P380307	
	SM 5310 B-2011	Organic Carbon	1.2		mg C/L	P380276	
2161740	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P379983	MS
2161754	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P379953	
		Calcium	0.12	I	mg/L	P379953	
		Iron	30	U	ug/L	P379953	
		Magnesium	0.040	U	mg/L	P379953	
		Potassium	0.30	U	mg/L	P379953	
		Sodium	0.50	U	mg/L	P379953	
		Zinc	5.0	U	ug/L	P379953	
		Aluminum	5.0	U	ug/L	P379953	
		Antimony	0.050	U	ug/L	P379953	
		Arsenic	0.050	U	ug/L	P379953	
		Boron**	2.0	U	ug/L	P379953	
		Cadmium	0.020	U	ug/L	P379953	
	EPA 200.8 Rev. 5.4	Chromium	0.40	U	ug/L	P379953	
		Copper	0.40	U	ug/L	P379953	
		Lead	0.20	U	ug/L	P379953	
		Nickel	0.50	U	ug/L	P379953	
		Selenium	0.20	U	ug/L	P379953	
		Silver	0.010	U	ug/L	P379953	
		Thallium	0.10	U	ug/L	P379953	
	SM 2340B	Hardness	0.43	I	mg/L	P379953	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: The result was confirmed on 03/18/2020.

EPA 351.2 Rev. 2.0: The result was confirmed on 03/17/2020.

EPA 353.2 Rev. 2.0: The result was confirmed on 03/11/2020.

EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 03/19/2020.

SM 5310 B-2011: The result was confirmed on 03/11/2020.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The result was confirmed on 03/05/2020.

EPA 200.7 Rev. 4.4: The calcium result was confirmed in the undigested sample on 03/04/2020.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P380008

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P379953

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: P379953

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: P380342

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380344

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380072

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: P380114

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380238

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380307

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P379983

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

Reference Method: SM 2120 B-2011
Batch ID: P380003

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P380270

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

Reference Method: SM 2540 C-2011
Batch ID: P380540

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P380542

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P380544

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P380421

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P380423

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P380424

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P380274

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P380276

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: P379953

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.2		P	85 - 115
Calcium	101		P	85 - 115
Iron	99.0		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	100		P	85 - 115
Sodium	104		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P379953

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	96.7		P	85 - 115
Arsenic	98.8		P	85 - 115
Boron	99.7		P	85 - 115
Cadmium	99.5		P	85 - 115
Chromium	103		P	85 - 115
Copper	102		P	85 - 115
Lead	98.5		P	85 - 115
Nickel	100		P	85 - 115
Selenium	98.6		P	85 - 115
Silver	102		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380342

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380344

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380072

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380114

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380238

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: P380307

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: P379983

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

Reference Method: SM 2120 B-2011
Batch ID: P380003

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

Reference Method: SM 2320 B-2011
Batch ID: P380270

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.1		P	98 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P380274

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	92 - 103

Reference Method: SM 5310 B-2011
Batch ID: P380276

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: P379953

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2160544	Barium	97.0		P	80 - 120
2160544	Calcium	97.6		P	80 - 120
2160544	Iron	100		P	80 - 120
2160544	Magnesium	101		P	80 - 120
2160544	Potassium	94.7		P	80 - 120
2160544	Sodium	103		P	80 - 120
2160544	Zinc	100		P	80 - 120
2160921	Barium	98.6	98.8	P/P	80 - 120
2160921	Calcium	101		P	80 - 120
2160921	Iron	102	102	P/P	80 - 120
2160921	Magnesium	105		P	80 - 120
2160921	Potassium	110	111	P/P	80 - 120
2160921	Sodium	107		P	80 - 120
2160921	Zinc	100	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P379953

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2160544	Aluminum	95.7		P	80 - 120
2160544	Antimony	98.8		P	80 - 120
2160544	Arsenic	102		P	80 - 120
2160544	Boron	98.8		P	80 - 120
2160544	Cadmium	104		P	80 - 120
2160544	Chromium	107		P	80 - 120
2160544	Copper	100		P	80 - 120
2160544	Lead	99.5		P	80 - 120
2160544	Nickel	99.5		P	80 - 120
2160544	Selenium	99.9		P	80 - 120
2160544	Silver	101		P	80 - 120
2160544	Thallium	104		P	80 - 120
2160921	Aluminum	95.9	100	P/P	80 - 120
2160921	Antimony	96.0	99.0	P/P	80 - 120
2160921	Arsenic	103	101	P/P	80 - 120
2160921	Boron	95.9	96.7	P/P	80 - 120
2160921	Cadmium	100	103	P/P	80 - 120
2160921	Chromium	103	104	P/P	80 - 120
2160921	Copper	98.3	101	P/P	80 - 120
2160921	Lead	95.3	99.0	P/P	80 - 120
2160921	Nickel	96.5	99.6	P/P	80 - 120
2160921	Selenium	101	98.7	P/P	80 - 120
2160921	Silver	102	102	P/P	80 - 120
2160921	Thallium	101	106	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380342

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161390	Chloride	96.5		P	90 - 110
2161732	Chloride	95.9		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380344

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161390	Sulfate	98.0		P	90 - 110
2161732	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380072

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161714	Ammonia-N	101	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380114

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161772	Kjeldahl Nitrogen	106	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380238

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161734	NO2NO3-N	91.2	91.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380307

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161734	Total-P	106	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P379983

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161797	O-Phosphate-P	64.5	62.2	F/F	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P380274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161886	Fluoride	103	105	P/P	89 - 106

Reference Method: SM 5310 B-2011
Batch ID: P380276

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2161796	Organic Carbon	97.9	99.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P380008

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161711	Turbidity	0.697	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P379953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2160921	Barium	0.232	Spike	P	0 - 20
2160921	Calcium	0.000615	Spike	P	0 - 20
2160921	Iron	0.371	Spike	P	0 - 20
2160921	Magnesium	1.08	Spike	P	0 - 20
2160921	Potassium	1.00	Spike	P	0 - 20
2160921	Sodium	0.0555	Spike	P	0 - 20
2160921	Zinc	0.847	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P379953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2160921	Aluminum	4.16	Spike	P	0 - 20
2160921	Antimony	3.05	Spike	P	0 - 20
2160921	Arsenic	1.29	Spike	P	0 - 20
2160921	Boron	0.683	Spike	P	0 - 20
2160921	Cadmium	2.85	Spike	P	0 - 20
2160921	Chromium	1.17	Spike	P	0 - 20
2160921	Copper	2.59	Spike	P	0 - 20
2160921	Lead	3.82	Spike	P	0 - 20
2160921	Nickel	3.22	Spike	P	0 - 20
2160921	Selenium	1.80	Spike	P	0 - 20
2160921	Silver	0.159	Spike	P	0 - 20
2160921	Thallium	5.28	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161732	Chloride	0.0634	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380344

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161732	Sulfate	0.322	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380072

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161714	Ammonia-N	0.264	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380114

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161772	Kjeldahl Nitrogen	0.611	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P380238

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161734	NO2NO3-N	0.525	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380307

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161734	Total-P	1.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P379983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161797	O-Phosphate-P	3.40	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P380003

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161726	Color (true)	1.76	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P380270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161886	Total Alkalinity	0.852	Sample	P	0 - 2.8

Reference Method: SM 2540 C-2011
Batch ID: P380540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161239	TDS	4.20	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
 Batch ID: P380542

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161394	TDS	2.83	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
 Batch ID: P380544

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161733	TDS	4.32	Sample	P	0 - 10

Reference Method: SM 2540 D-2011
 Batch ID: P380423

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161394	TSS	6.06	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
 Batch ID: P380274

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161886	Fluoride	1.42	Spike	P	0 - 2.5

Reference Method: SM 5310 B-2011
 Batch ID: P380276

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2161796	Organic Carbon	0.989	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: A97966

Included Lab Sample IDs: 2161736, 2161737, 2161740

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	98.5	P/P	90 - 110
O-Phosphate-P	98.5	97.3	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A97971

Included Lab Sample IDs: 2161732, 2161733, 2161738

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 115
Color (true)	99.0	101	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A97975

Included Lab Sample IDs: 2161732, 2161733, 2161738

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A97999

Included Lab Sample IDs: 2161734, 2161735, 2161739

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	102	P/P	90 - 110
Ammonia-N	102	99.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A98009

Included Lab Sample IDs: 2161752, 2161753, 2161754

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	101	P/P	90 - 110
Barium	101	102	P/P	90 - 110
Calcium	96.8	96.2	P/P	90 - 110
Calcium	96.9	96.9	P/P	90 - 110
Iron	100	99.0	P/P	90 - 110
Iron	98.1	99.2	P/P	90 - 110
Magnesium	101	99.4	P/P	90 - 110
Magnesium	98.5	99.8	P/P	90 - 110
Potassium	96.7	97.3	P/P	90 - 110
Potassium	98.2	97.9	P/P	90 - 110
Sodium	102	101	P/P	90 - 110
Sodium	99.6	100	P/P	90 - 110
Zinc	100	101	P/P	90 - 110
Zinc	99.5	99.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A98029

Included Lab Sample IDs: 2161752, 2161753, 2161754

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A98029

Included Lab Sample IDs: 2161752, 2161753, 2161754

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	102	P/P	90 - 110
Aluminum	106	102	P/P	90 - 110
Antimony	96.0	97.1	P/P	90 - 110
Antimony	96.4	96.9	P/P	90 - 110
Arsenic	100	101	P/P	90 - 110
Arsenic	99.3	102	P/P	90 - 110
Boron	102	98.7	P/P	90 - 110
Boron	99.8	100	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Cadmium	99.5	99.6	P/P	90 - 110
Chromium	101	103	P/P	90 - 110
Chromium	104	101	P/P	90 - 110
Copper	101	101	P/P	90 - 110
Copper	107	102	P/P	90 - 110
Lead	101	102	P/P	90 - 110
Lead	100	100	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Nickel	107	104	P/P	90 - 110
Selenium	100	101	P/P	90 - 110
Selenium	103	102	P/P	90 - 110
Silver	97.2	99.6	P/P	90 - 110
Silver	98.1	98.1	P/P	90 - 110
Thallium	95.0	97.5	P/P	90 - 110
Thallium	98.2	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A98035

Included Lab Sample IDs: 2161734, 2161735, 2161739

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A98055

Included Lab Sample IDs: 2161734, 2161735, 2161739

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.4	99.4	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A98057

Included Lab Sample IDs: 2161734, 2161735, 2161739

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	100	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A98059

Included Lab Sample IDs: 2161732, 2161733, 2161738

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

Reference Method: SM 2320 B-2011

Run ID: A98059

Included Lab Sample IDs: 2161732, 2161733, 2161738

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.7	98.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A98059

Included Lab Sample IDs: 2161732, 2161733, 2161738

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	103	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A98096

Included Lab Sample IDs: 2161732, 2161733, 2161738

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.7	98.8	P/P	90 - 110
Chloride	99.1	97.7	P/P	90 - 110
Sulfate	97.5	98.7	P/P	90 - 110
Sulfate	98.9	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A98155

Included Lab Sample IDs: 2161734, 2161735

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	102	P/P	90 - 110
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A98185

Included Lab Sample IDs: 2161739

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	98.8	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					0.697	
EPA 200.7 Rev. 4.4	Barium	99.2	97.0	98.6	98.8		0.232
	Calcium	101	97.6	101			0.0006
	Iron	99.0	100	102	102		0.371
	Magnesium	105	101	105			1.08
	Potassium	100	94.7	110	111		1.00
	Sodium	104	103	107			0.0555
	Zinc	100	100	100	101		0.847
EPA 200.8 Rev. 5.4	Aluminum	101	95.7	95.9	100		4.16
	Antimony	96.7	98.8	96.0	99.0		3.05
	Arsenic	98.8	102	103	101		1.29
	Boron	99.7	98.8	95.9	96.7		0.683
	Cadmium	99.5	104	100	103		2.85
	Chromium	103	107	103	104		1.17
	Copper	102	100	98.3	101		2.59
	Lead	98.5	99.5	95.3	99.0		3.82
	Nickel	100	99.5	96.5	99.6		3.22
	Selenium	98.6	99.9	101	98.7		1.80
	Silver	102	101	102	102		0.159
	Thallium	101	104	101	106		5.28
EPA 300.0 Rev. 2.1	Chloride	98.2	95.9	96.5		0.0634	
	Sulfate	98.3	98.4	98.0		0.322	
EPA 350.1 Rev. 2.0	Ammonia-N	98.5	101	101			0.264
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.0	106	107			0.611
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	91.2	91.7			0.525
EPA 365.1 Rev. 2.0	Total-P	104	106	108			1.02
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	105	64.5	62.2			3.40
SM 2120 B-2011	Color (true)	101				1.76	
SM 2320 B-2011	Total Alkalinity	99.1				0.852	
SM 2540 C-2011	TDS					4.20	
	TDS					2.83	
	TDS					4.32	
SM 2540 D-2011	TSS					6.06	
SM 4500 F-C-2011	Fluoride	98.8	103	105			1.42
SM 5310 B-2011	Organic Carbon	96.8	97.9	99.2			0.989

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2161732, 2161733, 2161738
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2161752, 2161753, 2161754
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2161752, 2161753, 2161754
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2161732, 2161733, 2161738
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2161732, 2161733, 2161738
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2161734, 2161735, 2161739
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2161734, 2161735, 2161739
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2161734, 2161735, 2161739
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2161734, 2161735, 2161739
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2161736, 2161737, 2161740
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2161732, 2161733, 2161738

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2161732, 2161733, 2161738
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2161752, 2161753, 2161754
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2161732, 2161733, 2161738
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2161732, 2161733, 2161738
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2161732, 2161733, 2161738
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2161734, 2161735, 2161739

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	03/03/2020			03/03/2020 18:12	Samantha Davila	2161732, 2161733, 2161738
EPA 200.7 Rev. 4.4	03/03/2020	03/03/2020 15:15	Elliott D. Healy	03/04/2020 15:08	Betina Topolski	2161754
	03/03/2020	03/03/2020 15:15	Elliott D. Healy	03/04/2020 19:07	Betina Topolski	2161752
	03/03/2020	03/03/2020 15:15	Elliott D. Healy	03/04/2020 19:15	Betina Topolski	2161753
EPA 200.8 Rev. 5.4	03/03/2020	03/03/2020 15:15	Elliott D. Healy	03/05/2020 14:48	Alexander Thompson	2161754
	03/03/2020	03/03/2020 15:15	Elliott D. Healy	03/05/2020 17:50	Alexander Thompson	2161752
	03/03/2020	03/03/2020 15:15	Elliott D. Healy	03/05/2020 17:57	Alexander Thompson	2161753
EPA 300.0 Rev. 2.1	03/03/2020			03/09/2020 18:39	Lipi Saha	2161732
	03/03/2020			03/09/2020 22:05	Lipi Saha	2161733
	03/03/2020			03/09/2020 22:17	Lipi Saha	2161738
EPA 350.1 Rev. 2.0	03/03/2020			03/04/2020 14:21	Ping Hua	2161734
	03/03/2020			03/04/2020 14:23	Ping Hua	2161735
	03/03/2020			03/04/2020 14:39	Ping Hua	2161739
EPA 351.2 Rev. 2.0	03/03/2020	03/05/2020 12:35	Sima Feizi	03/06/2020 20:35	Julia Storbeck	2161734
	03/03/2020	03/05/2020 12:35	Sima Feizi	03/06/2020 20:36	Julia Storbeck	2161735
	03/03/2020	03/05/2020 12:35	Sima Feizi	03/06/2020 20:38	Julia Storbeck	2161739
EPA 353.2 Rev. 2.0	03/03/2020			03/06/2020 11:19	Beverly Y. Sanders	2161734
	03/03/2020			03/06/2020 11:25	Beverly Y. Sanders	2161735
	03/03/2020			03/06/2020 11:27	Beverly Y. Sanders	2161739
EPA 365.1 Rev. 2.0	03/03/2020	03/09/2020 14:56	Yen Ta	03/11/2020 18:48	Benjamin T. Nordmann	2161734
	03/03/2020	03/09/2020 14:56	Yen Ta	03/11/2020 18:53	Benjamin T. Nordmann	2161735
	03/03/2020	03/09/2020 14:56	Yen Ta	03/12/2020 13:51	Benjamin T. Nordmann	2161739
EPA 365.1 Rev. 2.0 dissolved	03/03/2020			03/03/2020 16:22	Carlos Miranda	2161736
	03/03/2020			03/03/2020 16:27	Carlos Miranda	2161737
	03/03/2020			03/03/2020 16:28	Carlos Miranda	2161740
SM 2120 B-2011	03/03/2020			03/03/2020 18:33		2161738
	03/03/2020			03/03/2020 19:00		2161732, 2161733
SM 2320 B-2011	03/03/2020			03/07/2020 15:12	Samantha Davila	2161732
	03/03/2020			03/07/2020 15:24	Samantha Davila	2161733
	03/03/2020			03/07/2020 15:33	Samantha Davila	2161738
SM 2340B	03/03/2020			03/04/2020 15:08	Betina Topolski	2161754
	03/03/2020			03/04/2020 19:07	Betina Topolski	2161752
	03/03/2020			03/04/2020 19:15	Betina Topolski	2161753
SM 2540 C-2011	03/03/2020			03/05/2020 15:08	Yijie Li	2161732, 2161733, 2161738
SM 2540 D-2011	03/03/2020			03/05/2020 15:08	Yijie Li	2161732, 2161733, 2161738
SM 4500 F-C-2011	03/03/2020			03/07/2020 15:12	Samantha Davila	2161732
	03/03/2020			03/07/2020 15:24	Samantha Davila	2161733
	03/03/2020			03/07/2020 15:33	Samantha Davila	2161738
SM 5310 B-2011	03/03/2020			03/06/2020 19:28	Lauren Lees	2161734
	03/03/2020			03/06/2020 19:41	Lauren Lees	2161735

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	03/03/2020			03/06/2020 19:54	Lauren Lees	2161739