

Chemical Analysis Report

NW-DIST-2020-01-14-01

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

Event Description: **Bay Walton County Run**
Request ID: **RQ-2020-01-13-40**
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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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 29-JAN-2020 09:17

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 first name.

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: Black Creek Upstream of Hwy 20

Collection Date/Time: 01/13/2020 11:30

Field ID: G3NW0148

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2148886	EPA 180.1 Rev. 2.0	Turbidity	3.8		NTU	P377124	
	EPA 300.0 Rev. 2.1	Chloride	4.0		mg Cl/L	P377329	
		Sulfate	1.9		mg SO4/L	P377331	
	SM 2120 B-2011	Color (true)	120		PCU	P377117	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P377366	
	SM 2540 C-2011	TDS	40		mg/L	P377416	
	SM 2540 D-2011	TSS	2	IA	mg/L	P377205	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P377370	
2148888	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P377227	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38		mg N/L	P377277	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.025		mg N/L	P377414	
	EPA 365.1 Rev. 2.0	Total-P	0.007		mg P/L	P377462	
	SM 5310 B-2011	Organic Carbon	13		mg C/L	P377259	
2148890	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P377108	

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: Little Black Creek upstream of Black Creek

Collection Date/Time: 01/13/2020 11:50

Field ID: G3NW0200

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2148887	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P377124	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P377329	
		Sulfate	1.2		mg SO4/L	P377331	
	SM 2120 B-2011	Color (true)	67		PCU	P377117	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P377366	
	SM 2540 C-2011	TDS	29		mg/L	P377416	
	SM 2540 D-2011	TSS	2	I	mg/L	P377205	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P377370	
2148889	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P377227	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26	J	mg N/L	P377277	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.034		mg N/L	P377414	
	EPA 365.1 Rev. 2.0	Total-P	0.005		mg P/L	P377462	
	SM 5310 B-2011	Organic Carbon	7.5		mg C/L	P377259	
2148891	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P377108	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Refer to the Lab Analysis Report for an explanation of QC Codes.

Sample Location: Pine Log Creek upstream of Hwy 79

Collection Date/Time: 01/13/2020 12:30

Field ID: G3NW0153

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2148883	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P377124	
	EPA 300.0 Rev. 2.1	Chloride	3.3		mg Cl/L	P377329	
		Sulfate	1.4		mg SO4/L	P377331	
	SM 2120 B-2011	Color (true)	130		PCU	P377117	
	SM 2320 B-2011	Total Alkalinity	2.2	I	mg CaCO3/L	P377366	
	SM 2540 C-2011	TDS	42		mg/L	P377416	
	SM 2540 D-2011	TSS	2	I	mg/L	P377205	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P377370	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P377227	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38		mg N/L	P377277	MS
2148884	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P377414	
	EPA 365.1 Rev. 2.0	Total-P	0.007		mg P/L	P377462	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P377259	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P377108	
	dissolved						
2148898	EPA 200.7 Rev. 4.4	Barium	5.5		ug/L	P377073	
		Calcium	2.72		mg/L	P377073	
		Iron	240		ug/L	P377073	
		Magnesium	0.47		mg/L	P377073	
		Potassium	0.30	U	mg/L	P377073	
		Sodium	1.8	I	mg/L	P377073	
		Zinc	5.0	U	ug/L	P377073	
	EPA 200.8 Rev. 5.4	Aluminum	289		ug/L	P377073	
		Antimony	0.050	U	ug/L	P377073	
		Arsenic	0.24		ug/L	P377073	
		Boron**	8.8		ug/L	P377073	
		Cadmium	0.020	U	ug/L	P377073	
		Chromium	0.40	U	ug/L	P377073	
		Copper	0.40	U	ug/L	P377073	
		Lead	0.22	I	ug/L	P377073	
		Nickel	1.1	I	ug/L	P377073	
		Selenium	0.20	U	ug/L	P377073	
		Silver	0.010	U	ug/L	P377073	
		Thallium	0.10	U	ug/L	P377073	

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: P377124

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P377073

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: P377073

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: P377329

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P377331

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P377227

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: P377277

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P377414

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P377462

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P377108

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

Reference Method: SM 2120 B-2011
Batch ID: P377117

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P377366

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

Reference Method: SM 2540 C-2011
Batch ID: P377416

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P377205

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P377370

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: P377259

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: P377073

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	97.6		P	85 - 115
Calcium	101		P	85 - 115
Iron	102		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	101		P	85 - 115
Sodium	100		P	85 - 115
Zinc	98.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P377073

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	80 - 120
Antimony	102		P	80 - 120
Arsenic	99.4		P	80 - 120
Boron	106		P	85 - 115
Cadmium	98.8		P	80 - 120
Chromium	101		P	80 - 120
Copper	108		P	85 - 115
Lead	99.2		P	80 - 120
Nickel	99.7		P	80 - 120
Selenium	96.0		P	80 - 120
Silver	102		P	80 - 120
Thallium	106		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P377329

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P377331

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P377227

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P377277

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P377414

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P377462

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: P377108

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

Reference Method: SM 2120 B-2011
Batch ID: P377117

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.0		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P377366

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P377370

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	92 - 103

Reference Method: SM 5310 B-2011
Batch ID: P377259

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P377073

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148228	Barium	98.2		P	80 - 120
2148228	Calcium	104		P	80 - 120
2148228	Iron	101		P	80 - 120
2148228	Magnesium	103		P	80 - 120
2148228	Potassium	98.3		P	80 - 120
2148228	Sodium	102		P	80 - 120
2148228	Zinc	99.5		P	80 - 120
2148690	Barium	95.3	96.7	P/P	80 - 120
2148690	Calcium	111		P	80 - 120
2148690	Iron	99.9	104	P/P	80 - 120
2148690	Magnesium	108		P	80 - 120
2148690	Potassium	93.8	96.5	P/P	80 - 120
2148690	Sodium	108		P	80 - 120
2148690	Zinc	95.8	97.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P377073

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148228	Aluminum	99.2		P	80 - 120
2148228	Antimony	103		P	80 - 120
2148228	Arsenic	99.3		P	80 - 120
2148228	Boron	104		P	80 - 120
2148228	Cadmium	99.3		P	80 - 120
2148228	Chromium	101		P	80 - 120
2148228	Copper	105		P	80 - 120
2148228	Lead	101		P	80 - 120
2148228	Nickel	97.9		P	80 - 120
2148228	Selenium	90.7		P	80 - 120
2148228	Silver	99.5		P	80 - 120
2148228	Thallium	108		P	80 - 120
2148690	Aluminum	99.5	96.8	P/P	80 - 120
2148690	Antimony	105	102	P/P	80 - 120
2148690	Arsenic	101	98.0	P/P	80 - 120
2148690	Boron	110	109	P/P	80 - 120
2148690	Cadmium	103	98.0	P/P	80 - 120
2148690	Chromium	103	101	P/P	80 - 120
2148690	Copper	111	106	P/P	80 - 120
2148690	Lead	102	98.7	P/P	80 - 120
2148690	Nickel	99.4	95.6	P/P	80 - 120
2148690	Selenium	90.3	88.1	P/P	80 - 120
2148690	Silver	101	99.8	P/P	80 - 120
2148690	Thallium	109	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P377329

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148883	Chloride	101		P	90 - 110
2149312	Chloride	96.2		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P377331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148883	Sulfate	101		P	90 - 110
2149312	Sulfate	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P377227

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148884	Ammonia-N	102	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P377277

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148889	Kjeldahl Nitrogen	105	111	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P377414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148873	NO2NO3-N	97.0	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P377462

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148884	Total-P	107	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P377108

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148885	O-Phosphate-P	97.2	97.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P377370

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2149335	Fluoride	98.5	98.5	P/P	89 - 106

Reference Method: SM 5310 B-2011
Batch ID: P377259

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2148799	Organic Carbon	98.2	97.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P377124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148871	Turbidity	3.54	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P377073

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148690	Barium	1.37	Spike	P	0 - 20
2148690	Calcium	1.82	Spike	P	0 - 20
2148690	Iron	3.61	Spike	P	0 - 20
2148690	Magnesium	4.04	Spike	P	0 - 20
2148690	Potassium	1.50	Spike	P	0 - 20
2148690	Sodium	1.35	Spike	P	0 - 20
2148690	Zinc	1.94	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P377073

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148690	Aluminum	2.26	Spike	P	0 - 20
2148690	Antimony	3.68	Spike	P	0 - 20
2148690	Arsenic	3.33	Spike	P	0 - 20
2148690	Boron	0.738	Spike	P	0 - 20
2148690	Cadmium	4.52	Spike	P	0 - 20
2148690	Chromium	2.41	Spike	P	0 - 20
2148690	Copper	3.46	Spike	P	0 - 20
2148690	Lead	2.91	Spike	P	0 - 20
2148690	Nickel	3.89	Spike	P	0 - 20
2148690	Selenium	2.42	Spike	P	0 - 20
2148690	Silver	0.988	Spike	P	0 - 20
2148690	Thallium	3.60	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P377329

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2149312	Chloride	0.124	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P377331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2149312	Sulfate	0.424	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P377227

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148884	Ammonia-N	1.19	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P377277

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148889	Kjeldahl Nitrogen	4.77	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P377414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148873	NO2NO3-N	1.04	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P377462

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148884	Total-P	1.32	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P377108

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148885	O-Phosphate-P	0.615	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P377117

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148798	Color (true)	2.92	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P377366

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2149335	Total Alkalinity	0.767	Sample	P	0 - 2.8

Reference Method: SM 2540 C-2011
Batch ID: P377416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148837	TDS	1.01	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P377370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2149335	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-2011
Batch ID: P377259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2148799	Organic Carbon	0.535	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A96853

Included Lab Sample IDs: 2148883, 2148886, 2148887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.6	99.0	P/P	90 - 110
Sulfate	100	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A96878

Included Lab Sample IDs: 2148885, 2148890, 2148891

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	96.7	P/P	90 - 110
O-Phosphate-P	98.7	98.1	P/P	90 - 110
O-Phosphate-P	98.9	97.8	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A96880

Included Lab Sample IDs: 2148883, 2148886, 2148887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A96881

Included Lab Sample IDs: 2148883, 2148886, 2148887

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A96907

Included Lab Sample IDs: 2148884, 2148888, 2148889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	102	P/P	90 - 110
Ammonia-N	99.7	98.3	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A96933

Included Lab Sample IDs: 2148884, 2148888, 2148889

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A96954

Included Lab Sample IDs: 2148898

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A96954

Included Lab Sample IDs: 2148898

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	101	102	P/P	90 - 110
Zinc	99.6	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A96974

Included Lab Sample IDs: 2148884, 2148888, 2148889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	95.0	P/P	90 - 110
NO2NO3-N	98.0	97.0	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A96976

Included Lab Sample IDs: 2148883, 2148886, 2148887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A96976

Included Lab Sample IDs: 2148883, 2148886, 2148887

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A96983

Included Lab Sample IDs: 2148898

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.3	99.2	P/P	90 - 110
Antimony	97.5	98.8	P/P	90 - 110
Arsenic	100	101	P/P	90 - 110
Cadmium	99.7	101	P/P	90 - 110
Chromium	106	107	P/P	90 - 110
Copper	104	105	P/P	90 - 110
Lead	98.0	99.0	P/P	90 - 110
Nickel	104	105	P/P	90 - 110
Selenium	98.1	99.5	P/P	90 - 110
Silver	103	104	P/P	90 - 110
Thallium	95.6	96.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A97004

Included Lab Sample IDs: 2148884, 2148888, 2148889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.9	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A97009

Included Lab Sample IDs: 2148898

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	103	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A97094

Included Lab Sample IDs: 2148884, 2148888, 2148889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	108	109	P/P	90 - 110
Total-P	110	108	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					3.54	
EPA 200.7 Rev. 4.4	Barium	97.6		98.2	95.3	96.7	1.37
	Calcium	101		104	111		1.82
	Iron	102		101	99.9	104	3.61
	Magnesium	101		103	108		4.04
	Potassium	101		98.3	93.8	96.5	1.50
	Sodium	100		102	108		1.35
	Zinc	98.0		99.5	95.8	97.7	1.94
EPA 200.8 Rev. 5.4	Aluminum	100		99.2	99.5	96.8	2.26
	Antimony	102		103	105	102	3.68
	Arsenic	99.4		99.3	101	98.0	3.33
	Boron	106		110	109	104	0.738
	Cadmium	98.8		99.3	103	98.0	4.52
	Chromium	101		101	103	101	2.41
	Copper	108		105	111	106	3.46
	Lead	99.2		101	102	98.7	2.91
	Nickel	99.7		97.9	99.4	95.6	3.89
	Selenium	96.0		90.7	90.3	88.1	2.42
	Silver	102		99.5	101	99.8	0.988
	Thallium	106		108	109	105	3.60
EPA 300.0 Rev. 2.1	Chloride	100		96.2	101		0.124
	Sulfate	98.9		99.1	101		0.424
EPA 350.1 Rev. 2.0	Ammonia-N	101		104	102		1.19
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107		105	111		4.77
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	97.0		97.0	96.0		1.04
EPA 365.1 Rev. 2.0	Total-P	104		107	106		1.32
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102		97.2	97.8		0.615
SM 2120 B-2011	Color (true)	99.0				2.92	
SM 2320 B-2011	Total Alkalinity	104				0.767	
SM 2540 C-2011	TDS					1.01	
SM 4500 F-C-2011	Fluoride	99.4		98.5	98.5		0.0
SM 5310 B-2011	Organic Carbon	97.6		98.2	97.4		0.535

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2148883, 2148886, 2148887
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2148898
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2148898
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2148883, 2148886, 2148887
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2148883, 2148886, 2148887
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2148884, 2148888, 2148889
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2148884, 2148888, 2148889
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2148884, 2148888, 2148889
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2148884, 2148888, 2148889

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2148885, 2148890, 2148891
SM 2120 B-2011 / E31780	True Color measured at 450 nm (not valid for NPDES monitoring)	2148883, 2148886, 2148887
SM 2320 B-2011 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2148883, 2148886, 2148887
SM 2540 C-2011 / E31780	Total Dissolved Solids in aqueous matrices	2148883, 2148886, 2148887
SM 2540 D-2011 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2148883, 2148886, 2148887
SM 4500 F-C-2011 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2148883, 2148886, 2148887
SM 5310 B-2011 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2148884, 2148888, 2148889

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	01/14/2020			01/14/2020 16:34	Yen Ta	2148883, 2148886, 2148887
EPA 200.7 Rev. 4.4	01/14/2020	01/14/2020 15:20	Elliott D. Healy	01/16/2020 14:14	Betina Topolski	2148898
EPA 200.8 Rev. 5.4	01/14/2020	01/14/2020 15:20	Elliott D. Healy	01/17/2020 20:27	Alexander Thompson	2148898
	01/14/2020	01/14/2020 15:20	Elliott D. Healy	01/21/2020 15:42	Alexander Thompson	2148898
EPA 300.0 Rev. 2.1	01/14/2020			01/16/2020 16:27	Lipi Saha	2148883
	01/14/2020			01/16/2020 16:51	Lipi Saha	2148886
	01/14/2020			01/16/2020 17:03	Lipi Saha	2148887
EPA 350.1 Rev. 2.0	01/14/2020			01/15/2020 13:34	Ping Hua	2148884
	01/14/2020			01/15/2020 13:49	Ping Hua	2148888
	01/14/2020			01/15/2020 13:50	Ping Hua	2148889
EPA 351.2 Rev. 2.0	01/14/2020	01/16/2020 13:40	Jhamieka S. Greenwood	01/21/2020 13:05	Virginia P. Brown	2148884
	01/14/2020	01/16/2020 13:40	Jhamieka S. Greenwood	01/21/2020 13:07	Virginia P. Brown	2148888
	01/14/2020	01/16/2020 13:40	Jhamieka S. Greenwood	01/21/2020 13:09	Virginia P. Brown	2148889
EPA 353.2 Rev. 2.0	01/14/2020			01/17/2020 10:53	Beverly Y. Sanders	2148888
	01/14/2020			01/17/2020 10:54	Beverly Y. Sanders	2148889
	01/14/2020			01/17/2020 12:57	Beverly Y. Sanders	2148884
EPA 365.1 Rev. 2.0	01/14/2020	01/21/2020 14:26	Yen Ta	01/23/2020 12:43	Benjamin T. Nordmann	2148884
	01/14/2020	01/21/2020 14:26	Yen Ta	01/23/2020 12:52	Benjamin T. Nordmann	2148888
	01/14/2020	01/21/2020 14:26	Yen Ta	01/23/2020 12:53	Benjamin T. Nordmann	2148889
EPA 365.1 Rev. 2.0 dissolved	01/14/2020			01/14/2020 16:51	Julia Storbeck	2148885
	01/14/2020			01/14/2020 17:19	Julia Storbeck	2148890
	01/14/2020			01/14/2020 17:24	Julia Storbeck	2148891
SM 2120 B-2011	01/14/2020			01/14/2020 17:18	Madeline Funaro	2148883
	01/14/2020			01/14/2020 17:19	Madeline Funaro	2148886
	01/14/2020			01/14/2020 17:20	Madeline Funaro	2148887
SM 2320 B-2011	01/14/2020			01/17/2020 01:26	Dale L. Simmons	2148883
	01/14/2020			01/17/2020 01:37	Dale L. Simmons	2148886
	01/14/2020			01/17/2020 01:48	Dale L. Simmons	2148887
SM 2540 C-2011	01/14/2020			01/14/2020 17:25	Yijie Li	2148883, 2148886, 2148887
SM 2540 D-2011	01/14/2020			01/14/2020 17:25	Yijie Li	2148883, 2148886, 2148887
SM 4500 F-C-2011	01/14/2020			01/17/2020 01:26	Dale L. Simmons	2148883
	01/14/2020			01/17/2020 01:37	Dale L. Simmons	2148886
	01/14/2020			01/17/2020 01:48	Dale L. Simmons	2148887
SM 5310 B-2011	01/14/2020			01/16/2020 04:35	Madeline Funaro	2148884
	01/14/2020			01/16/2020 04:48	Madeline Funaro	2148888
	01/14/2020			01/16/2020 05:01	Madeline Funaro	2148889