

Chemical Analysis Report

NW-DIST-2019-10-18-01

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

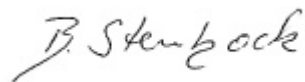
Event Description: **Holmes Run**
Request ID: **RQ-2019-10-14-21**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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Pensacola, FL 32502-5794
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 13-NOV-2019 15:48



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: Choctawhatchee River upstream Hwy 90 boat ramp

Collection Date/Time: 10/17/2019 10:45

Field ID: G3NW0052

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2129446	EPA 180.1 Rev. 2.0	Turbidity	12	A	NTU	P372751	
	EPA 300.0 Rev. 2.1	Chloride	6.8		mg Cl/L	P373389	
		Sulfate	3.8		mg SO4/L	P373391	
	SM 2120 B	Color (true)	10		PCU	P372857	
	SM 2320 B-97	Total Alkalinity	62		mg CaCO3/L	P373039	
	SM 2540 C-97	TDS	88		mg/L	P373316	
	SM 2540 D-97	TSS	14		mg/L	P373287	
	SM 4500 F-C-97	Fluoride	0.057	I	mg F/L	P373042	
2129448	EPA 350.1 Rev. 2.0	Ammonia-N	0.048		mg N/L	P373046	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26		mg N/L	P372990	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.82		mg N/L	P373064	
	EPA 365.1 Rev. 2.0	Total-P	0.071		mg P/L	P372909	
	SM 5310 B-00	Organic Carbon	1.5		mg C/L	P372969	
2129450	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.037		mg P/L	P372789	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: East Pittman Creek upstream of Hwy 179

Collection Date/Time: 10/17/2019 11:20

Field ID: G3NW0157

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2129447	EPA 180.1 Rev. 2.0	Turbidity	3.8		NTU	P372751	
	EPA 300.0 Rev. 2.1	Chloride	5.0		mg Cl/L	P373389	
		Sulfate	0.43	I	mg SO4/L	P373391	
	SM 2120 B	Color (true)	27		PCU	P372857	
	SM 2320 B-97	Total Alkalinity	9.1		mg CaCO3/L	P373039	
	SM 2540 C-97	TDS	27		mg/L	P373316	
	SM 2540 D-97	TSS	2	I	mg/L	P373287	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P373042	
2129449	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P373046	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.22		mg N/L	P372990	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.3		mg N/L	P373064	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P372909	
	SM 5310 B-00	Organic Carbon	2.4		mg C/L	P373049	
2129451	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P372789	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Limestone Branch upstream of Mt. Ida Rd

Collection Date/Time: 10/17/2019 11:40

Field ID: G3NW0023

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2129443	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P372751	
	EPA 300.0 Rev. 2.1	Chloride	5.0	A	mg Cl/L	P373389	
		Sulfate	2.5	A	mg SO4/L	P373391	
		Color (true)	16		PCU	P372857	
	SM 2320 B-97	Total Alkalinity	115		mg CaCO3/L	P373039	
	SM 2540 C-97	TDS	126	A	mg/L	P373316	
	SM 2540 D-97	TSS	2	UA	mg/L	P373287	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P373042	
2129444	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P373046	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.15	I	mg N/L	P372990	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P373064	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P372909	
	SM 5310 B-00	Organic Carbon	1.9		mg C/L	P372969	
2129445	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P372789	
2129462	EPA 200.7 Rev. 4.4	Barium	14.4		ug/L	P372835	
		Calcium	43.7		mg/L	P372835	
		Iron	340		ug/L	P372835	
		Magnesium	2.70		mg/L	P372835	
		Potassium	1.0	I	mg/L	P372835	
		Sodium	2.3		mg/L	P372835	
		Zinc	5.0	U	ug/L	P372835	
	EPA 200.8 Rev. 5.4	Aluminum	24		ug/L	P372835	
		Antimony	0.050	U	ug/L	P372835	
		Arsenic	0.27		ug/L	P372835	
		Boron**	10.5		ug/L	P372835	
		Cadmium	0.020	U	ug/L	P372835	
		Chromium	0.40	U	ug/L	P372835	
		Copper	0.40	U	ug/L	P372835	
		Lead	0.20	U	ug/L	P372835	
		Nickel	0.50	U	ug/L	P372835	
		Selenium	0.20	U	ug/L	P372835	
		Silver	0.010	U	ug/L	P372835	
		Thallium	0.10	U	ug/L	P372835	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P372751

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P372835

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: P372835

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: P373389

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373391

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373046

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: P372990

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373064

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372909

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372789

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

Reference Method: SM 2120 B
Batch ID: P372857

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P373039

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

Reference Method: SM 2540 C-97
Batch ID: P373316

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P373287

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P373042

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P372969

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

Reference Method: SM 5310 B-00
Batch ID: P373049

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: P372835

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	99.8		P	85 - 115
Iron	105		P	85 - 115
Magnesium	99.7		P	85 - 115
Potassium	101		P	85 - 115
Sodium	96.8		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P372835

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.9		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	97.6		P	85 - 115
Boron	92.9		P	85 - 115
Cadmium	98.7		P	85 - 115
Chromium	96.6		P	85 - 115
Copper	98.6		P	85 - 115
Lead	101		P	85 - 115
Nickel	94.5		P	85 - 115
Selenium	97.0		P	85 - 115
Silver	103		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373391

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: P373046

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372990

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373064

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372909

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372789

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	95.7		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P372857

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.9		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P373039

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P373042

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P372969

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

Reference Method: SM 5310 B-00
Batch ID: P373049

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P372835

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129627	Barium	99.9		P	80 - 120
2129627	Calcium	94.4		P	80 - 120
2129627	Iron	104		P	80 - 120
2129627	Magnesium	103		P	80 - 120
2129627	Potassium	97.5		P	80 - 120
2129627	Sodium	92.3		P	80 - 120
2129627	Zinc	98.5		P	80 - 120
2129682	Barium	100	99.7	P/P	80 - 120
2129682	Calcium	101		P	80 - 120
2129682	Iron	102	104	P/P	80 - 120
2129682	Magnesium	101		P	80 - 120
2129682	Potassium	98.7	102	P/P	80 - 120
2129682	Sodium	97.4		P	80 - 120
2129682	Zinc	96.1	95.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P372835

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129627	Aluminum	94.2		P	80 - 120
2129627	Antimony	102		P	80 - 120
2129627	Arsenic	96.9		P	80 - 120
2129627	Boron	89.8		P	80 - 120
2129627	Cadmium	94.8		P	80 - 120
2129627	Chromium	96.4		P	80 - 120
2129627	Copper	93.7		P	80 - 120
2129627	Lead	99.3		P	80 - 120
2129627	Nickel	92.3		P	80 - 120
2129627	Selenium	93.2		P	80 - 120
2129627	Silver	102		P	80 - 120
2129627	Thallium	103		P	80 - 120
2129682	Aluminum	95.1	95.5	P/P	80 - 120
2129682	Antimony	105	105	P/P	80 - 120
2129682	Arsenic	99.2	100	P/P	80 - 120
2129682	Boron	93.4	95.0	P/P	80 - 120
2129682	Cadmium	101	102	P/P	80 - 120
2129682	Chromium	96.9	99.0	P/P	80 - 120
2129682	Copper	93.8	91.8	P/P	80 - 120
2129682	Lead	102	104	P/P	80 - 120
2129682	Nickel	92.2	94.8	P/P	80 - 120
2129682	Selenium	95.3	96.1	P/P	80 - 120
2129682	Silver	106	104	P/P	80 - 120
2129682	Thallium	107	107	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129443	Chloride	99.1		P	90 - 110
2129508	Chloride	98.1		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373391

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129443	Sulfate	97.9		P	90 - 110
2129508	Sulfate	98.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129444	Ammonia-N	97.9	96.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372990

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129444	Kjeldahl Nitrogen	101	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373064

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129444	NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129444	Total-P	101	99.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P373042

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129511	Fluoride	98.3	99.0	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P372969

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129179	Organic Carbon	98.0	98.8	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P373049

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2129520	Organic Carbon	98.0	96.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P372751

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129446	Turbidity	5.08	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P372835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129682	Barium	0.517	Spike	P	0 - 20
2129682	Calcium	0.644	Spike	P	0 - 20
2129682	Iron	2.11	Spike	P	0 - 20
2129682	Magnesium	1.76	Spike	P	0 - 20
2129682	Potassium	3.11	Spike	P	0 - 20
2129682	Sodium	0.344	Spike	P	0 - 20
2129682	Zinc	0.310	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P372835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129682	Aluminum	0.411	Spike	P	0 - 20
2129682	Antimony	0.433	Spike	P	0 - 20
2129682	Arsenic	1.05	Spike	P	0 - 20
2129682	Boron	1.42	Spike	P	0 - 20
2129682	Cadmium	0.862	Spike	P	0 - 20
2129682	Chromium	2.11	Spike	P	0 - 20
2129682	Copper	2.20	Spike	P	0 - 20
2129682	Lead	1.88	Spike	P	0 - 20
2129682	Nickel	2.79	Spike	P	0 - 20
2129682	Selenium	0.795	Spike	P	0 - 20
2129682	Silver	1.37	Spike	P	0 - 20
2129682	Thallium	0.0311	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129443	Chloride	0.308	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P373391

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129443	Sulfate	0.124	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P373046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129444	Ammonia-N	1.49	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372990

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129444	Kjeldahl Nitrogen	4.24	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P373064

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129444	NO2NO3-N	0.766	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129444	Total-P	1.79	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372789

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129378	O-Phosphate-P	0.211	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P372857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129373	Color (true)	1.79	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P373039

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129511	Total Alkalinity	0.484	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P373316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129443	TDS	3.98	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P373042

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129511	Fluoride	0.524	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P372969

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129179	Organic Carbon	0.489	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P373049

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2129520	Organic Carbon	1.08	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A95071

Included Lab Sample IDs: 2129443, 2129446, 2129447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A95090

Included Lab Sample IDs: 2129445, 2129450, 2129451

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	99.7	P/P	90 - 110
O-Phosphate-P	99.7	98.8	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A95126

Included Lab Sample IDs: 2129443, 2129446, 2129447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.0	97.0	P/P	90 - 115

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A95158

Included Lab Sample IDs: 2129462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	101	P/P	90 - 110
Calcium	99.2	94.5	P/P	90 - 110
Iron	100	96.5	P/P	90 - 110
Magnesium	100	96.6	P/P	90 - 110
Potassium	99.4	96.0	P/P	90 - 110
Sodium	96.7	92.1	P/P	90 - 110
Zinc	101	98.9	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A95164

Included Lab Sample IDs: 2129444, 2129448

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.6	94.7	P/P	90 - 110
Organic Carbon	94.7	97.4	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A95197

Included Lab Sample IDs: 2129443, 2129446, 2129447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A95197

Included Lab Sample IDs: 2129443, 2129446, 2129447

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A95203

Included Lab Sample IDs: 2129444, 2129448, 2129449

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

Reference Method: SM 5310 B-00

Run ID: A95204

Included Lab Sample IDs: 2129449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	105	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A95205

Included Lab Sample IDs: 2129448

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A95211

Included Lab Sample IDs: 2129444, 2129448, 2129449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A95245

Included Lab Sample IDs: 2129444, 2129448, 2129449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	107	P/P	90 - 110
Kjeldahl Nitrogen	105	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A95246

Included Lab Sample IDs: 2129444, 2129449

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A95307

Included Lab Sample IDs: 2129443, 2129446, 2129447

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A95467

Included Lab Sample IDs: 2129462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	100	100	P/P	90 - 110
Lead	99.8	99.5	P/P	90 - 110
Silver	102	102	P/P	90 - 110
Thallium	95.7	95.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A95530

Included Lab Sample IDs: 2129462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.5	92.5	P/P	90 - 110
Antimony	97.9	96.5	P/P	90 - 110
Arsenic	96.5	94.0	P/P	90 - 110
Boron	92.9	90.9	P/P	90 - 110
Chromium	95.3	95.9	P/P	90 - 110
Nickel	94.2	93.3	P/P	90 - 110
Selenium	96.5	95.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A95607

Included Lab Sample IDs: 2129462

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

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

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

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					5.08	
EPA 200.7 Rev. 4.4	Barium	104	99.9	100	99.7		0.517
	Calcium	99.8	94.4	101			0.644
	Iron	105	104	102	104		2.11
	Magnesium	99.7	103	101			1.76
	Potassium	101	97.5	98.7	102		3.11
	Sodium	96.8	92.3	97.4			0.344
	Zinc	100	98.5	96.1	95.8		0.310
EPA 200.8 Rev. 5.4	Aluminum	95.9	94.2	95.1	95.5		0.411
	Antimony	103	102	105	105		0.433
	Arsenic	97.6	96.9	99.2	100		1.05
	Boron	92.9	89.8	93.4	95.0		1.42
	Cadmium	98.7	94.8	101	102		0.862
	Chromium	96.6	96.4	96.9	99.0		2.11
	Copper	98.6	93.7	93.8	91.8		2.20
	Lead	101	99.3	102	104		1.88
	Nickel	94.5	92.3	92.2	94.8		2.79
	Selenium	97.0	93.2	95.3	96.1		0.795
	Silver	103	102	106	104		1.37
	Thallium	103	103	107	107		0.0311
EPA 300.0 Rev. 2.1	Chloride	99.9	99.1	98.1		0.308	
	Sulfate	98.9	97.9	98.0		0.124	
EPA 350.1 Rev. 2.0	Ammonia-N	98.8	97.9	96.1			1.49
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	101	106			4.24
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.5	103	104			0.766
EPA 365.1 Rev. 2.0	Total-P	97.4	101	99.3			1.79
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	95.7					0.211
SM 2120 B	Color (true)	98.9				1.79	
SM 2320 B-97	Total Alkalinity	103				0.484	
SM 2540 C-97	TDS					3.98	
SM 4500 F-C-97	Fluoride	97.9	98.3	99.0			0.524
SM 5310 B-00	Organic Carbon	97.9	98.0	98.8			0.489
	Organic Carbon	95.6	98.0	96.8			1.08

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2129443, 2129446, 2129447
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2129462
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2129462
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2129443, 2129446, 2129447
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2129443, 2129446, 2129447
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2129444, 2129448, 2129449
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2129444, 2129448, 2129449
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2129444, 2129448, 2129449
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2129444, 2129448, 2129449

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	2129445, 2129450, 2129451
SM 2120 B / E31780	True Color measured at 450 nm	2129443, 2129446, 2129447
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2129443, 2129446, 2129447
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2129443, 2129446, 2129447
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2129443, 2129446, 2129447
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2129443, 2129446, 2129447
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2129444, 2129448, 2129449

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	10/18/2019			10/18/2019 15:49	Samantha Davila	2129443, 2129446, 2129447
EPA 200.7 Rev. 4.4	10/18/2019	10/21/2019 18:15	Elliott D. Healy	10/22/2019 22:53	Alexander Thompson	2129462
EPA 200.8 Rev. 5.4	10/18/2019	10/21/2019 18:15	Elliott D. Healy	11/05/2019 02:14	Robert K Palmer	2129462
	10/18/2019	10/21/2019 18:15	Elliott D. Healy	11/06/2019 15:16	Robert K Palmer	2129462
	10/18/2019	10/21/2019 18:15	Elliott D. Healy	11/11/2019 06:33	Robert K Palmer	2129462
EPA 300.0 Rev. 2.1	10/18/2019			10/29/2019 19:56	Julia Storbeck	2129443
	10/18/2019			10/29/2019 22:45	Julia Storbeck	2129446
	10/18/2019			10/29/2019 22:58	Julia Storbeck	2129447
EPA 350.1 Rev. 2.0	10/18/2019			10/23/2019 12:08	Ping Hua	2129444
	10/18/2019			10/23/2019 12:29	Ping Hua	2129448
	10/18/2019			10/23/2019 12:30	Ping Hua	2129449
EPA 351.2 Rev. 2.0	10/18/2019	10/23/2019 12:50	Sima Feizi	10/24/2019 16:04	Jhamieka S. Greenwood	2129444
	10/18/2019	10/23/2019 12:50	Sima Feizi	10/24/2019 16:19	Jhamieka S. Greenwood	2129448
	10/18/2019	10/23/2019 12:50	Sima Feizi	10/24/2019 16:21	Jhamieka S. Greenwood	2129449
EPA 353.2 Rev. 2.0	10/18/2019			10/24/2019 10:27	Beverly Y. Sanders	2129444
	10/18/2019			10/24/2019 12:29	Beverly Y. Sanders	2129448
	10/18/2019			10/24/2019 12:30	Beverly Y. Sanders	2129449
EPA 365.1 Rev. 2.0	10/18/2019	10/22/2019 14:40	Lipi Saha	10/23/2019 13:39	Rosalyn Ballman	2129448
	10/18/2019	10/22/2019 14:40	Lipi Saha	10/23/2019 18:24	Rosalyn Ballman	2129444
	10/18/2019	10/22/2019 14:40	Lipi Saha	10/23/2019 18:25	Rosalyn Ballman	2129449
EPA 365.1 Rev. 2.0 dissolved	10/18/2019			10/18/2019 16:10	Virginia P. Brown	2129445
	10/18/2019			10/18/2019 16:11	Virginia P. Brown	2129450
	10/18/2019			10/18/2019 16:16	Virginia P. Brown	2129451
SM 2120 B	10/18/2019			10/18/2019 17:49	Madeline Funaro	2129443
	10/18/2019			10/18/2019 17:50	Madeline Funaro	2129446
	10/18/2019			10/18/2019 17:51	Madeline Funaro	2129447
SM 2320 B-97	10/18/2019			10/24/2019 00:00	Dale L. Simmons	2129443
	10/18/2019			10/24/2019 00:12	Dale L. Simmons	2129446
	10/18/2019			10/24/2019 00:24	Dale L. Simmons	2129447
SM 2540 C-97	10/18/2019			10/23/2019 14:58	Yijie Li	2129443, 2129446, 2129447
SM 2540 D-97	10/18/2019			10/23/2019 14:58	Yijie Li	2129443, 2129446, 2129447
SM 4500 F-C-97	10/18/2019			10/24/2019 00:00	Dale L. Simmons	2129443
	10/18/2019			10/24/2019 00:12	Dale L. Simmons	2129446
	10/18/2019			10/24/2019 00:24	Dale L. Simmons	2129447
SM 5310 B-00	10/18/2019			10/22/2019 07:38	Madeline Funaro	2129444
	10/18/2019			10/22/2019 08:15	Madeline Funaro	2129448
	10/18/2019			10/23/2019 18:51	Madeline Funaro	2129449