

Chemical Analysis Report

TLH-ROC-2019-11-13-02

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

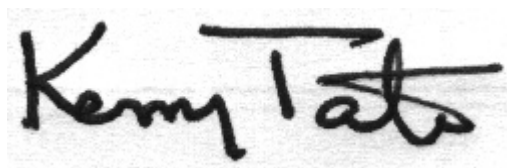
Event Description: **Run 11**
Request ID: **RQ-2019-08-12-35**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 03-DEC-2019 11:58

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: Apalachicola River 500m from Lola Landing Boat Ramp

Collection Date/Time: 11/13/2019 13:10

Field ID: G2TLHR0044

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2135912	EPA 180.1 Rev. 2.0	Turbidity	6.1		NTU	P374250	
	EPA 300.0 Rev. 2.1	Chloride	6.5	A	mg Cl/L	P374399	
		Sulfate	6.8	A	mg SO4/L	P374402	
	SM 2120 B	Color (true)	10		PCU	P374264	
	SM 2320 B-97	Total Alkalinity	46		mg CaCO3/L	P374494	
	SM 2540 C-97	TDS	97		mg/L	P374828	
	SM 2540 D-97	TSS	7	I	mg/L	P374818	
	SM 4500 F-C-97	Fluoride	0.072	I	mg F/L	P374498	
2135913	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P374438	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24		mg N/L	P374519	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.58		mg N/L	P374284	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P374706	
	SM 5310 B-00	Organic Carbon	2.6		mg C/L	P374355	
2135914	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P374274	
2135917	EPA 200.7 Rev. 4.4	Barium	19.7		ug/L	P374233	
		Calcium	15.5		mg/L	P374233	
		Iron	230		ug/L	P374233	
		Magnesium	1.98		mg/L	P374233	
		Potassium	1.8		mg/L	P374233	
		Sodium	6.8		mg/L	P374233	
		Zinc	5.0	U	ug/L	P374233	
	EPA 200.8 Rev. 5.4	Aluminum	116		ug/L	P374233	
		Antimony	0.050	U	ug/L	P374233	
		Arsenic	0.44		ug/L	P374233	
		Boron**	17.7		ug/L	P374233	
		Cadmium	0.020	U	ug/L	P374233	
		Chromium	0.40	U	ug/L	P374233	
		Copper	0.46	I	ug/L	P374233	
		Lead	0.20	U	ug/L	P374233	
		Nickel	0.50	U	ug/L	P374233	
		Selenium	0.20	U	ug/L	P374233	
		Silver	0.010	U	ug/L	P374233	
		Thallium	0.10	U	ug/L	P374233	

Ref. Method and Comment:

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples 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: P374250

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P374233

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: P374233

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: P374399

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374402

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374438

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: P374519

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374284

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374706

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374274

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

Reference Method: SM 2120 B
Batch ID: P374264

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P374494

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

Reference Method: SM 2540 C-97
Batch ID: P374828

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P374818

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P374498

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: P374355

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: P374233

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	91.8		P	85 - 115
Iron	94.3		P	85 - 115
Magnesium	93.1		P	85 - 115
Potassium	97.8		P	85 - 115
Sodium	90.4		P	85 - 115
Zinc	98.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P374233

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.7		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	98.8		P	85 - 115
Boron	96.0		P	85 - 115
Cadmium	97.1		P	85 - 115
Chromium	99.0		P	85 - 115
Copper	99.6		P	85 - 115
Lead	93.3		P	85 - 115
Nickel	99.2		P	85 - 115
Selenium	95.5		P	85 - 115
Silver	97.9		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374399

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374402

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374438

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374519

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374284

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	101		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374706

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374274

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	95.8		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P374264

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

Reference Method: SM 2320 B-97
Batch ID: P374494

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P374498

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.6		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P374355

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	104		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P374233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135411	Barium	100		P	80 - 120
2135411	Iron	93.8		P	80 - 120
2135411	Magnesium	95.0		P	80 - 120
2135411	Potassium	107		P	80 - 120
2135411	Sodium	96.4		P	80 - 120
2135411	Zinc	98.9		P	80 - 120
2135719	Barium	99.1	97.4	P/P	80 - 120
2135719	Calcium	91.5		P	80 - 120
2135719	Iron	93.9	96.1	P/P	80 - 120
2135719	Magnesium	93.9		P	80 - 120
2135719	Potassium	93.6	94.2	P/P	80 - 120
2135719	Sodium	91.2		P	80 - 120
2135719	Zinc	97.6	95.3	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P374233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135411	Aluminum	92.8		P	80 - 120
2135411	Antimony	102		P	80 - 120
2135411	Arsenic	98.1		P	80 - 120
2135411	Boron	94.7		P	80 - 120
2135411	Cadmium	97.9		P	80 - 120
2135411	Chromium	95.9		P	80 - 120
2135411	Copper	95.6		P	80 - 120
2135411	Lead	92.9		P	80 - 120
2135411	Nickel	94.6		P	80 - 120
2135411	Selenium	93.3		P	80 - 120
2135411	Silver	97.2		P	80 - 120
2135411	Thallium	101		P	80 - 120
2135719	Aluminum	96.1	97.6	P/P	80 - 120
2135719	Antimony	102	103	P/P	80 - 120
2135719	Arsenic	101	103	P/P	80 - 120
2135719	Boron	98.1	100	P/P	80 - 120
2135719	Cadmium	99.3	99.8	P/P	80 - 120
2135719	Chromium	98.6	100	P/P	80 - 120
2135719	Copper	95.6	98.0	P/P	80 - 120
2135719	Lead	94.1	95.6	P/P	80 - 120
2135719	Nickel	97.8	98.6	P/P	80 - 120
2135719	Selenium	92.9	97.1	P/P	80 - 120
2135719	Silver	96.1	98.6	P/P	80 - 120
2135719	Thallium	112	106	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374399

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135912	Chloride	97.2		P	90 - 110
2136001	Chloride	97.5		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135912	Sulfate	96.8		P	90 - 110
2136001	Sulfate	95.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374438

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135913	Ammonia-N	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374519

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135929	Kjeldahl Nitrogen	98.0	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374284

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135931	NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374706

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135669	Total-P	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135904	O-Phosphate-P	95.0	96.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P374498

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135668	Fluoride	99.1	99.1	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P374355

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135902	Organic Carbon	101	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P374250

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136269	Turbidity	10.2	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P374233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135719	Barium	1.57	Spike	P	0 - 20
2135719	Calcium	0.176	Spike	P	0 - 20
2135719	Iron	2.29	Spike	P	0 - 20
2135719	Magnesium	1.59	Spike	P	0 - 20
2135719	Potassium	0.343	Spike	P	0 - 20
2135719	Sodium	0.511	Spike	P	0 - 20
2135719	Zinc	2.39	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P374233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135719	Aluminum	1.47	Spike	P	0 - 20
2135719	Antimony	0.406	Spike	P	0 - 20
2135719	Arsenic	2.15	Spike	P	0 - 20
2135719	Boron	1.50	Spike	P	0 - 20
2135719	Cadmium	0.450	Spike	P	0 - 20
2135719	Chromium	1.41	Spike	P	0 - 20
2135719	Copper	2.32	Spike	P	0 - 20
2135719	Lead	1.60	Spike	P	0 - 20
2135719	Nickel	0.818	Spike	P	0 - 20
2135719	Selenium	4.48	Spike	P	0 - 20
2135719	Silver	2.53	Spike	P	0 - 20
2135719	Thallium	5.92	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374399

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135912	Chloride	2.59	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135912	Sulfate	0.581	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374438

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135913	Ammonia-N	0.535	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374519

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135929	Kjeldahl Nitrogen	8.04	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374284

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135931	NO2NO3-N	0.471	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135669	Total-P	0.425	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374274

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135904	O-Phosphate-P	1.36	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P374264

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135926	Color (true)	2.66	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P374494

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135668	Total Alkalinity	0.253	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P374828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135551	TDS	4.47	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P374498

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135668	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P374355

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135902	Organic Carbon	0.434	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: A95743

Included Lab Sample IDs: 2135912

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

Reference Method: SM 2120 B

Run ID: A95748

Included Lab Sample IDs: 2135912

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A95752

Included Lab Sample IDs: 2135913

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A95753

Included Lab Sample IDs: 2135914

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A95765

Included Lab Sample IDs: 2135912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.5	102	P/P	90 - 110
Sulfate	99.8	102	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A95788

Included Lab Sample IDs: 2135913

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	106	106	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A95796

Included Lab Sample IDs: 2135917

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.4	101	P/P	90 - 110
Calcium	99.0	99.4	P/P	90 - 110
Iron	99.6	99.2	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	95.6	95.6	P/P	90 - 110
Sodium	99.3	99.8	P/P	90 - 110
Zinc	98.7	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A95824

Included Lab Sample IDs: 2135913

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

Reference Method: SM 2320 B-97

Run ID: A95843

Included Lab Sample IDs: 2135912

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

Reference Method: SM 4500 F-C-97

Run ID: A95843

Included Lab Sample IDs: 2135912

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A95873

Included Lab Sample IDs: 2135917

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	99.7	P/P	90 - 110
Antimony	101	99.6	P/P	90 - 110
Arsenic	102	102	P/P	90 - 110
Boron	99.9	102	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Copper	104	104	P/P	90 - 110
Lead	96.2	95.4	P/P	90 - 110
Nickel	104	103	P/P	90 - 110
Selenium	101	99.3	P/P	90 - 110
Silver	100	99.1	P/P	90 - 110
Thallium	98.4	96.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A95884

Included Lab Sample IDs: 2135913

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.9	97.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A95924

Included Lab Sample IDs: 2135917

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	95.7	97.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A95989

Included Lab Sample IDs: 2135913

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	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					10.2	
EPA 200.7 Rev. 4.4	Barium	101	100	99.1	97.4		1.57
	Calcium	91.8		91.5			0.176
	Iron	94.3	93.8	93.9	96.1		2.29
	Magnesium	93.1	95.0	93.9			1.59
	Potassium	97.8	107	93.6	94.2		0.343
	Sodium	90.4	96.4	91.2			0.511
	Zinc	98.7	98.9	97.6	95.3		2.39
EPA 200.8 Rev. 5.4	Aluminum	96.7	92.8	96.1	97.6		1.47
	Antimony	101	102	102	103		0.406
	Arsenic	98.8	98.1	101	103		2.15
	Boron	96.0	94.7	98.1	100		1.50
	Cadmium	97.1	97.9	99.3	99.8		0.450
	Chromium	99.0	95.9	98.6	100		1.41
	Copper	99.6	95.6	95.6	98.0		2.32
	Lead	93.3	92.9	94.1	95.6		1.60
	Nickel	99.2	94.6	97.8	98.6		0.818
	Selenium	95.5	93.3	92.9	97.1		4.48
	Silver	97.9	97.2	96.1	98.6		2.53
	Thallium	100	101	112	106		5.92
EPA 300.0 Rev. 2.1	Chloride	98.9	97.2	97.5		2.59	
	Sulfate	98.7	96.8	95.2		0.581	
EPA 350.1 Rev. 2.0	Ammonia-N	100	100	101			0.535
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	98.0	108			8.04
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	99.0	99.5			0.471
EPA 365.1 Rev. 2.0	Total-P	101	100	101			0.425
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	95.8	95.0	96.3			1.36
SM 2120 B	Color (true)	101				2.66	
SM 2320 B-97	Total Alkalinity	100				0.253	
SM 2540 C-97	TDS					4.47	
SM 4500 F-C-97	Fluoride	98.6	99.1	99.1			0.0
SM 5310 B-00	Organic Carbon	104	101	101			0.434

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2135912
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2135917
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2135917
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2135912
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2135912
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2135913
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2135913
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2135913
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2135913

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2135914
SM 2120 B / E31780	True Color measured at 450 nm	2135912
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2135912
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2135912
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2135912
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2135912
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2135913

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	11/13/2019			11/14/2019 17:30	Blanca Fach	2135912
EPA 200.7 Rev. 4.4	11/13/2019	11/14/2019 15:00	Elliott D. Healy	11/18/2019 15:19	Betina Topolski	2135917
EPA 200.8 Rev. 5.4	11/13/2019	11/14/2019 15:00	Elliott D. Healy	11/21/2019 07:05	Justin Cutchin	2135917
	11/13/2019	11/14/2019 15:00	Elliott D. Healy	11/22/2019 17:48	Robert K Palmer	2135917
EPA 300.0 Rev. 2.1	11/13/2019			11/18/2019 14:55	Lipi Saha	2135912
EPA 350.1 Rev. 2.0	11/13/2019			11/18/2019 12:07	Ping Hua	2135913
EPA 351.2 Rev. 2.0	11/13/2019	11/20/2019 12:30	Sima Feizi	11/21/2019 16:49	Jhamieka S. Greenwood	2135913
EPA 353.2 Rev. 2.0	11/13/2019			11/15/2019 08:36	Beverly Y. Sanders	2135913
EPA 365.1 Rev. 2.0	11/13/2019	11/22/2019 13:04	Yen Ta	11/26/2019 16:07	Benjamin T. Nordmann	2135913
EPA 365.1 Rev. 2.0 dissolved	11/13/2019			11/14/2019 15:54	Samantha Davila	2135914
SM 2120 B	11/13/2019			11/14/2019 16:13	Madeline Funaro	2135912
SM 2320 B-97	11/13/2019			11/16/2019 04:49	Dale L. Simmons	2135912
SM 2540 C-97	11/13/2019			11/15/2019 15:21	Yijie Li	2135912
SM 2540 D-97	11/13/2019			11/15/2019 15:21	Yijie Li	2135912
SM 4500 F-C-97	11/13/2019			11/16/2019 04:49	Dale L. Simmons	2135912
SM 5310 B-00	11/13/2019			11/15/2019 17:44	Lauren Lees	2135913