

Chemical Analysis Report

TLH-ROC-2019-09-11-01

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

Event Description: **Run 4**
Request ID: **RQ-2019-09-09-33**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 02-OCT-2019 13:38

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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: Unnamed Branch @ Hardaway Rd 2

Collection Date/Time: 09/11/2019 09:35

Field ID: G2TLHR0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2118254	EPA 180.1 Rev. 2.0	Turbidity	6.4		NTU	P370499	
	EPA 300.0 Rev. 2.1	Chloride	4.1		mg Cl/L	P370812	
		Sulfate	0.52	I	mg SO4/L	P370815	
		Color (true)	32	A	PCU	P370532	
	SM 2120 B	Total Alkalinity	4.0		mg CaCO3/L	P371031	
	SM 2540 C-97	TDS	19	I	mg/L	P371182	
	SM 2540 D-97	TSS	11		mg/L	P371156	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P371509	
2118256	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P370765	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27		mg N/L	P370725	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P370633	
	EPA 365.1 Rev. 2.0	Total-P	0.096		mg P/L	P370645	
	SM 5310 B-00	Organic Carbon	3.1		mg C/L	P370754	
2118258	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.042		mg P/L	P370501	
2118264	EPA 200.7 Rev. 4.4	Barium	15.4		ug/L	P370724	
		Calcium	1.64		mg/L	P370724	
		Iron	1.05E+03		ug/L	P370724	
		Magnesium	0.92		mg/L	P370724	
		Potassium	0.31	I	mg/L	P370724	
		Sodium	2.1		mg/L	P370724	
		Zinc	5.0	U	ug/L	P370724	
	EPA 200.8 Rev. 5.4	Aluminum	233		ug/L	P370724	
		Antimony	0.050	U	ug/L	P370724	
		Arsenic	0.69		ug/L	P370724	
		Boron**	8.7		ug/L	P370724	
		Cadmium	0.020	U	ug/L	P370724	
		Chromium	0.62	I	ug/L	P370724	
		Copper	0.40	U	ug/L	P370724	
		Lead	0.21	I	ug/L	P370724	
		Nickel	0.50	U	ug/L	P370724	
		Selenium	0.20	U	ug/L	P370724	
		Silver	0.010	U	ug/L	P370724	
		Thallium	0.10	U	ug/L	P370724	

Ref. Method and Comment:

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

Sample Location: South Mosquito Creek @ Power Line

Collection Date/Time: 09/11/2019 10:10

Field ID: G2TLHR0039

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2118255	EPA 180.1 Rev. 2.0	Turbidity	14	A	NTU	P370499	
	EPA 300.0 Rev. 2.1	Chloride	4.3		mg Cl/L	P370812	
		Sulfate	0.50	I	mg SO4/L	P370815	
	SM 2120 B	Color (true)	45		PCU	P370532	
	SM 2320 B-97	Total Alkalinity	22		mg CaCO3/L	P371031	
	SM 2540 C-97	TDS	41		mg/L	P371182	
	SM 2540 D-97	TSS	17		mg/L	P371156	
	SM 4500 F-C-97	Fluoride	0.051	I	mg F/L	P371509	
2118257	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P370765	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32		mg N/L	P370725	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.47		mg N/L	P370633	
	EPA 365.1 Rev. 2.0	Total-P	0.065		mg P/L	P370645	
	SM 5310 B-00	Organic Carbon	3.1		mg C/L	P370754	
2118259	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P370501	
2118265	EPA 200.7 Rev. 4.4	Barium	19.4		ug/L	P370724	
		Calcium	5.59		mg/L	P370724	
		Iron	1.19E+03		ug/L	P370724	
		Magnesium	2.68		mg/L	P370724	
		Potassium	0.54	I	mg/L	P370724	
		Sodium	2.4		mg/L	P370724	
		Zinc	5.0	U	ug/L	P370724	
	EPA 200.8 Rev. 5.4	Aluminum	652		ug/L	P370724	
		Antimony	0.050	U	ug/L	P370724	
		Arsenic	0.61		ug/L	P370724	
		Boron**	9.8		ug/L	P370724	
		Cadmium	0.020	U	ug/L	P370724	
		Chromium	0.88	I	ug/L	P370724	
		Copper	0.40	U	ug/L	P370724	
		Lead	0.48		ug/L	P370724	
		Nickel	0.50	U	ug/L	P370724	
		Selenium	0.20	U	ug/L	P370724	
		Silver	0.010	U	ug/L	P370724	
		Thallium	0.10	U	ug/L	P370724	

Ref. Method and Comment:

SM 2540 D-97: 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: P370499

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P370724

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: P370724

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: P370812

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370815

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370765

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: P370725

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370633

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370645

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370501

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

Reference Method: SM 2120 B
Batch ID: P370532

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P371031

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

Reference Method: SM 2540 C-97
Batch ID: P371182

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P371156

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P371509

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: P370754

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: P370724

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	91.9		P	85 - 115
Calcium	104		P	85 - 115
Iron	100		P	85 - 115
Magnesium	99.8		P	85 - 115
Potassium	98.5		P	85 - 115
Sodium	101		P	85 - 115
Zinc	99.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P370724

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.1		P	85 - 115
Antimony	95.4		P	85 - 115
Arsenic	99.5		P	85 - 115
Boron	97.8		P	85 - 115
Cadmium	96.6		P	85 - 115
Chromium	90.4		P	85 - 115
Copper	90.6		P	85 - 115
Lead	89.4		P	85 - 115
Nickel	96.5		P	85 - 115
Selenium	97.8		P	85 - 115
Silver	94.4		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370812

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370815

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370765

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370725

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P370633

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: P370645

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P370501

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	103		P	90 - 110

Reference Method: SM 2120 B
 Batch ID: P370532

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-97
 Batch ID: P371031

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

Reference Method: SM 4500 F-C-97
 Batch ID: P371509

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.7		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P370754

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P370724

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118069	Barium	99.5	101	P/P	80 - 120
2118069	Calcium	104		P	80 - 120
2118069	Iron	103	103	P/P	80 - 120
2118069	Magnesium	103	101	P/P	80 - 120
2118069	Potassium	106	106	P/P	80 - 120
2118069	Sodium	102		P	80 - 120
2118069	Zinc	101	98.8	P/P	80 - 120
2118292	Barium	98.5		P	80 - 120
2118292	Calcium	105		P	80 - 120
2118292	Iron	104		P	80 - 120
2118292	Magnesium	104		P	80 - 120
2118292	Potassium	103		P	80 - 120
2118292	Sodium	109		P	80 - 120
2118292	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P370724

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118069	Aluminum	98.8	98.0	P/P	80 - 120
2118069	Antimony	94.0	97.4	P/P	80 - 120
2118069	Arsenic	96.1	97.1	P/P	80 - 120
2118069	Boron	100	100	P/P	80 - 120
2118069	Cadmium	94.2	95.4	P/P	80 - 120
2118069	Chromium	91.8	92.9	P/P	80 - 120
2118069	Copper	91.6	93.4	P/P	80 - 120
2118069	Lead	90.6	92.0	P/P	80 - 120
2118069	Nickel	94.0	94.6	P/P	80 - 120
2118069	Selenium	95.5	95.2	P/P	80 - 120
2118069	Silver	94.0	95.3	P/P	80 - 120
2118069	Thallium	103	105	P/P	80 - 120
2118292	Aluminum	95.9		P	80 - 120
2118292	Antimony	98.5		P	80 - 120
2118292	Arsenic	92.8		P	80 - 120
2118292	Boron	101		P	80 - 120
2118292	Cadmium	93.4		P	80 - 120
2118292	Chromium	89.8		P	80 - 120
2118292	Copper	87.7		P	80 - 120
2118292	Lead	89.9		P	80 - 120
2118292	Nickel	89.0		P	80 - 120
2118292	Selenium	92.6		P	80 - 120
2118292	Silver	94.9		P	80 - 120
2118292	Thallium	101		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370812

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118065	Chloride	103	104	P/P	90 - 110
2118275	Chloride	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118065	Sulfate	103	105	P/P	90 - 110
2118275	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370765

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118269	Ammonia-N	101	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118269	Kjeldahl Nitrogen	98.0	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370633

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118232	NO2NO3-N	98.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370645

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118202	Total-P	98.3	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370501

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2117965	O-Phosphate-P	96.4	96.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P371509

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119156	Fluoride	97.0	97.0	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P370754

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118256	Organic Carbon	103	104	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P370499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118255	Turbidity	6.45	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P370724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118069	Barium	1.09	Spike	P	0 - 20
2118069	Calcium	0.361	Spike	P	0 - 20
2118069	Iron	0.208	Spike	P	0 - 20
2118069	Magnesium	1.47	Spike	P	0 - 20
2118069	Potassium	0.181	Spike	P	0 - 20
2118069	Sodium	1.32	Spike	P	0 - 20
2118069	Zinc	2.26	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P370724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118069	Aluminum	0.651	Spike	P	0 - 20
2118069	Antimony	3.55	Spike	P	0 - 20
2118069	Arsenic	0.990	Spike	P	0 - 20
2118069	Boron	0.204	Spike	P	0 - 20
2118069	Cadmium	1.31	Spike	P	0 - 20
2118069	Chromium	1.28	Spike	P	0 - 20
2118069	Copper	1.98	Spike	P	0 - 20
2118069	Lead	1.56	Spike	P	0 - 20
2118069	Nickel	0.604	Spike	P	0 - 20
2118069	Selenium	0.352	Spike	P	0 - 20
2118069	Silver	1.45	Spike	P	0 - 20
2118069	Thallium	1.76	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370812

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118065	Chloride	0.959	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118065	Sulfate	1.67	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370765

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118269	Ammonia-N	0.463	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118269	Kjeldahl Nitrogen	5.53	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370633

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118232	NO2NO3-N	0.234	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370645

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118202	Total-P	2.16	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370501

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2117965	O-Phosphate-P	0.489	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P370532

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118254	Color (true)	1.20	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P371031

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119156	Total Alkalinity	1.59	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P371182

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118204	TDS	7.41	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P371509

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119156	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P370754

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2118256	Organic Carbon	0.378	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A94136

Included Lab Sample IDs: 2118254, 2118255

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94137

Included Lab Sample IDs: 2118258, 2118259

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A94152

Included Lab Sample IDs: 2118254, 2118255

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A94159

Included Lab Sample IDs: 2118254, 2118255

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94193

Included Lab Sample IDs: 2118256, 2118257

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94245

Included Lab Sample IDs: 2118256, 2118257

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.4	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A94255

Included Lab Sample IDs: 2118256, 2118257

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	103	104	P/P	90 - 110
Organic Carbon	104	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94258

Included Lab Sample IDs: 2118256, 2118257

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94258

Included Lab Sample IDs: 2118256, 2118257

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94277

Included Lab Sample IDs: 2118256, 2118257

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	96.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A94285

Included Lab Sample IDs: 2118264, 2118265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	96.0	98.5	P/P	90 - 110
Calcium	97.7	99.7	P/P	90 - 110
Iron	99.1	98.8	P/P	90 - 110
Magnesium	97.4	97.5	P/P	90 - 110
Potassium	98.1	98.5	P/P	90 - 110
Sodium	97.4	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A94322

Included Lab Sample IDs: 2118264, 2118265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	99.3	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A94353

Included Lab Sample IDs: 2118254, 2118255

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94386

Included Lab Sample IDs: 2118264, 2118265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	102	P/P	90 - 110
Arsenic	96.6	95.0	P/P	90 - 110
Boron	96.3	105	P/P	90 - 110
Cadmium	96.1	95.9	P/P	90 - 110
Nickel	96.7	95.1	P/P	90 - 110
Selenium	96.3	96.0	P/P	90 - 110
Thallium	95.2	95.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94545

Included Lab Sample IDs: 2118264, 2118265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	92.8	97.1	P/P	90 - 110
Copper	93.6	96.1	P/P	90 - 110
Lead	93.4	97.8	P/P	90 - 110
Silver	94.0	98.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A94568

Included Lab Sample IDs: 2118254, 2118255

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94590

Included Lab Sample IDs: 2118264, 2118265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	92.6	93.2	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					6.45	
EPA 200.7 Rev. 4.4	Barium	91.9	99.5	101	98.5		1.09
	Calcium	104	104	105			0.361
	Iron	100	103	103	104		0.208
	Magnesium	99.8	103	101	104		1.47
	Potassium	98.5	106	106	103		0.181
	Sodium	101	102	109			1.32
	Zinc	99.0	101	98.8	101		2.26
EPA 200.8 Rev. 5.4	Aluminum	98.1	98.8	98.0	95.9		0.651
	Antimony	95.4	94.0	97.4	98.5		3.55
	Arsenic	99.5	96.1	97.1	92.8		0.990
	Boron	97.8	100	100	101		0.204
	Cadmium	96.6	94.2	95.4	93.4		1.31
	Chromium	90.4	91.8	92.9	89.8		1.28
	Copper	90.6	91.6	93.4	87.7		1.98
	Lead	89.4	90.6	92.0	89.9		1.56
	Nickel	96.5	94.0	94.6	89.0		0.604
	Selenium	97.8	95.5	95.2	92.6		0.352
	Silver	94.4	94.0	95.3	94.9		1.45
	Thallium	102	103	105	101		1.76
EPA 300.0 Rev. 2.1	Chloride	102	103	104	101		0.959
	Sulfate	103	103	105	102		1.67
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	100			0.463
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	98.0	106			5.53
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	98.2				0.234
EPA 365.1 Rev. 2.0	Total-P	99.6	98.3	101			2.16
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	96.4	96.9			0.489
SM 2120 B	Color (true)	100				1.20	
SM 2320 B-97	Total Alkalinity	104				1.59	
SM 2540 C-97	TDS					7.41	
SM 4500 F-C-97	Fluoride	95.7	97.0	97.0			0.0
SM 5310 B-00	Organic Carbon	102	103	104			0.378

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2118254, 2118255
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2118264, 2118265
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2118264, 2118265
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2118254, 2118255
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2118254, 2118255
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2118256, 2118257
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2118256, 2118257
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2118256, 2118257
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2118256, 2118257

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	2118258, 2118259
SM 2120 B / E31780	True Color measured at 450 nm	2118254, 2118255
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2118254, 2118255
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2118254, 2118255
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2118254, 2118255
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2118254, 2118255
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2118256, 2118257

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	09/11/2019			09/11/2019 16:13	Samantha Davila	2118254, 2118255
EPA 200.7 Rev. 4.4	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/17/2019 15:12	Alexander Thompson	2118264
	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/17/2019 15:17	Alexander Thompson	2118265
	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/18/2019 18:01	Betina Topolski	2118264
	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/18/2019 18:06	Betina Topolski	2118265
EPA 200.8 Rev. 5.4	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/20/2019 18:43	Justin Cutchin	2118264
	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/20/2019 18:53	Justin Cutchin	2118265
	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/26/2019 18:17	Robert K Palmer	2118264
	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/26/2019 18:23	Robert K Palmer	2118265
	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/27/2019 10:16	Robert K Palmer	2118264
	09/11/2019	09/16/2019 14:50	Elliott D. Healy	09/27/2019 10:22	Robert K Palmer	2118265
EPA 300.0 Rev. 2.1	09/11/2019			09/14/2019 09:23	Jhamieka S. Greenwood	2118254
	09/11/2019			09/14/2019 09:36	Jhamieka S. Greenwood	2118255
EPA 350.1 Rev. 2.0	09/11/2019			09/16/2019 13:05	Ping Hua	2118256
	09/11/2019			09/16/2019 13:07	Ping Hua	2118257
EPA 351.2 Rev. 2.0	09/11/2019	09/16/2019 14:05	Sima Feizi	09/17/2019 13:51	Julia Storbeck	2118256
	09/11/2019	09/16/2019 14:05	Sima Feizi	09/17/2019 13:52	Julia Storbeck	2118257
EPA 353.2 Rev. 2.0	09/11/2019			09/13/2019 09:14	Beverly Y. Sanders	2118256
	09/11/2019			09/13/2019 09:15	Beverly Y. Sanders	2118257
EPA 365.1 Rev. 2.0	09/11/2019	09/13/2019 13:45	Lipi Saha	09/16/2019 13:02	Rosalyn Ballman	2118256
	09/11/2019	09/13/2019 13:45	Lipi Saha	09/16/2019 13:03	Rosalyn Ballman	2118257
EPA 365.1 Rev. 2.0 dissolved	09/11/2019			09/11/2019 16:25	Jhamieka S. Greenwood	2118258
	09/11/2019			09/11/2019 16:26	Jhamieka S. Greenwood	2118259
SM 2120 B	09/11/2019			09/11/2019 17:49	Madeline Funaro	2118254
	09/11/2019			09/11/2019 17:50	Madeline Funaro	2118255
SM 2320 B-97	09/11/2019			09/18/2019 05:29	Dale L. Simmons	2118254
	09/11/2019			09/18/2019 05:41	Dale L. Simmons	2118255
SM 2540 C-97	09/11/2019			09/17/2019 14:10	Yijie Li	2118254, 2118255
SM 2540 D-97	09/11/2019			09/17/2019 14:10	Yijie Li	2118254, 2118255
SM 4500 F-C-97	09/11/2019			09/25/2019 18:09	Dale L. Simmons	2118254
	09/11/2019			09/25/2019 18:13	Dale L. Simmons	2118255
SM 5310 B-00	09/11/2019			09/16/2019 15:47	Madeline Funaro	2118256
	09/11/2019			09/16/2019 19:04	Madeline Funaro	2118257