

Chemical Analysis Report

NE-DIST-2019-12-13-01

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

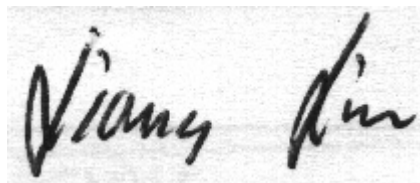
Event Description: **LSJR Lake**
Request ID: **RQ-2019-12-09-45**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 07-JAN-2020 16:04

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: Silver Lake Center

Collection Date/Time: 12/12/2019 10:10

Field ID: G2NE1132

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2144111	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P376188	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P376406	
		Sulfate	3.1		mg SO4/L	P376408	
	SM 2120 B	Color (true)	690		PCU	P375989	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P376260	
	SM 2540 C-97	TDS	94		mg/L	P376421	
	SM 2540 D-97	TSS	2	I	mg/L	P376361	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P376263	
	EPA 350.1 Rev. 2.0	Ammonia-N	1.1		mg N/L	P376347	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.2		mg N/L	P375960	
2144113	EPA 353.2 Rev. 2.0	NO2NO3-N	0.098		mg N/L	P376241	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P376071	
	SM 5310 B-00	Organic Carbon	39		mg C/L	P376029	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.025		mg P/L	P375860	
	dissolved						

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: Lake Como, Center

Collection Date/Time: 12/12/2019 10:55

Field ID: 20030627

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2144112	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P376188	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P376406	
		Sulfate	7.1		mg SO4/L	P376408	
	SM 2120 B	Color (true)	22	A	PCU	P375990	
	SM 2320 B-97	Total Alkalinity	1.2	I	mg CaCO3/L	P376260	
	SM 2540 C-97	TDS	49		mg/L	P376421	
	SM 2540 D-97	TSS	2	I	mg/L	P376361	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P376263	
2144114	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P376347	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P375960	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P376241	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P376071	
	SM 5310 B-00	Organic Carbon	7.0		mg C/L	P376029	
2144116	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P375860	

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: Dunns Creek 0.4 miles upstream of US17

Collection Date/Time: 12/12/2019 11:35

Field ID: G2NE1187

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2144117	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P376188	
	EPA 300.0 Rev. 2.1	Chloride	170		mg Cl/L	P376407	
		Sulfate	46		mg SO4/L	P376409	
		Color (true)	140		PCU	P375990	
	SM 2320 B-97	Total Alkalinity	86		mg CaCO3/L	P376260	
	SM 2540 C-97	TDS	481	A	mg/L	P376421	
	SM 2540 D-97	TSS	5	IA	mg/L	P376361	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P376263	
2144118	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P376347	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P375960	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P376241	
	EPA 365.1 Rev. 2.0	Total-P	0.070		mg P/L	P376071	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P376029	
2144119	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.041		mg P/L	P375860	
2144124	EPA 200.7 Rev. 4.4	Barium	14.2		ug/L	P375985	
		Calcium	48.9		mg/L	P375985	
		Iron	200		ug/L	P375985	
		Magnesium	15.6		mg/L	P375985	
		Potassium	4.0		mg/L	P375985	
		Sodium	95.9		mg/L	P375985	
		Zinc	5.0	U	ug/L	P375985	
	EPA 200.8 Rev. 5.4	Aluminum	45		ug/L	P375985	
		Antimony	0.056	I	ug/L	P375985	
		Arsenic	0.87		ug/L	P375985	
		Boron**	51.4		ug/L	P375985	
		Cadmium	0.020	U	ug/L	P375985	
		Chromium	0.40	U	ug/L	P375985	
		Copper	0.40	U	ug/L	P375985	
		Lead	0.24	I	ug/L	P375985	
		Nickel	0.50	U	ug/L	P375985	
		Selenium	0.21	I	ug/L	P375985	
		Silver	0.010	U	ug/L	P375985	
		Thallium	0.10	U	ug/L	P375985	

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: P376188

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P375985

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: P375985

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: P376406

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376407

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376408

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376409

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P376347

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375960

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376241

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P376071

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375860

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

Reference Method: SM 2120 B
Batch ID: P375989

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P375990

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P376260

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P376421

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P376361

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P376263

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P376029

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: P375985

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	100		P	85 - 115
Calcium	104		P	85 - 115
Iron	104		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	101		P	85 - 115
Sodium	103		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P375985

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.7		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	98.9		P	85 - 115
Boron	109		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	99.5		P	85 - 115
Copper	96.9		P	85 - 115
Lead	107		P	85 - 115
Nickel	97.5		P	85 - 115
Selenium	98.7		P	85 - 115
Silver	101		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376406

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376407

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376408

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376409

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P376347

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: P375960

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376241

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P376071

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: P375860

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.8		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P375989

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.8		P	85 - 115

Reference Method: SM 2120 B
Batch ID: P375990

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

Reference Method: SM 2320 B-97
Batch ID: P376260

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

Reference Method: SM 4500 F-C-97
Batch ID: P376263

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	92 - 103

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P376029

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P375985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2143707	Barium	97.2	98.8	P/P	80 - 120
2143707	Calcium	109		P	80 - 120
2143707	Iron	104	104	P/P	80 - 120
2143707	Magnesium	103		P	80 - 120
2143707	Potassium	101	102	P/P	80 - 120
2143707	Sodium	102	103	P/P	80 - 120
2143707	Zinc	97.1	98.9	P/P	80 - 120
2144164	Barium	98.7		P	80 - 120
2144164	Calcium	103		P	80 - 120
2144164	Iron	102		P	80 - 120
2144164	Magnesium	101		P	80 - 120
2144164	Potassium	99.4		P	80 - 120
2144164	Sodium	101		P	80 - 120
2144164	Zinc	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P375985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2143707	Aluminum	94.3	91.9	P/P	80 - 120
2143707	Antimony	106	108	P/P	80 - 120
2143707	Arsenic	99.4	98.9	P/P	80 - 120
2143707	Boron	104	104	P/P	80 - 120
2143707	Cadmium	103	102	P/P	80 - 120
2143707	Chromium	103	102	P/P	80 - 120
2143707	Copper	91.4	90.3	P/P	80 - 120
2143707	Lead	109	109	P/P	80 - 120
2143707	Nickel	94.4	93.0	P/P	80 - 120
2143707	Selenium	93.3	92.4	P/P	80 - 120
2143707	Silver	101	102	P/P	80 - 120
2143707	Thallium	104	106	P/P	80 - 120
2144164	Aluminum	93.1		P	80 - 120
2144164	Antimony	107		P	80 - 120
2144164	Arsenic	99.9		P	80 - 120
2144164	Boron	109		P	80 - 120
2144164	Cadmium	103		P	80 - 120
2144164	Chromium	103		P	80 - 120
2144164	Copper	91.7		P	80 - 120
2144164	Lead	109		P	80 - 120
2144164	Nickel	93.5		P	80 - 120
2144164	Selenium	95.8		P	80 - 120
2144164	Silver	101		P	80 - 120
2144164	Thallium	105		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376406

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2143349	Chloride	99.1		P	90 - 110
2144045	Chloride	98.9		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376407

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2144399	Chloride	99.9	99.9	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376408

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2143349	Sulfate	99.4		P	90 - 110
2144045	Sulfate	99.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376409

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2144399	Sulfate	101	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P376347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2144048	Ammonia-N	102	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375960

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2143995	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2144114	NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P376071

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2144049	Total-P	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375860

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2144140	O-Phosphate-P	98.5	97.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P376263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2144357	Fluoride	99.1	99.7	P/P	89 - 106

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P376029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2144047	Organic Carbon	96.1	95.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P376188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144138	Turbidity	4.88	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P375985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2143707	Barium	1.61	Spike	P	0 - 20
2143707	Calcium	0.840	Spike	P	0 - 20
2143707	Iron	0.179	Spike	P	0 - 20
2143707	Magnesium	0.310	Spike	P	0 - 20
2143707	Potassium	0.634	Spike	P	0 - 20
2143707	Sodium	0.642	Spike	P	0 - 20
2143707	Zinc	1.31	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P375985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2143707	Aluminum	2.57	Spike	P	0 - 20
2143707	Antimony	1.53	Spike	P	0 - 20
2143707	Arsenic	0.505	Spike	P	0 - 20
2143707	Boron	0.0271	Spike	P	0 - 20
2143707	Cadmium	0.592	Spike	P	0 - 20
2143707	Chromium	1.44	Spike	P	0 - 20
2143707	Copper	1.16	Spike	P	0 - 20
2143707	Lead	0.103	Spike	P	0 - 20
2143707	Nickel	1.43	Spike	P	0 - 20
2143707	Selenium	0.861	Spike	P	0 - 20
2143707	Silver	1.20	Spike	P	0 - 20
2143707	Thallium	1.80	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376406

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2143349	Chloride	0.133	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376407

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144399	Chloride	0.0379	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2143349	Sulfate	0.0434	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P376409

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144399	Sulfate	0.0274	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P376347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144048	Ammonia-N	1.86	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2143995	Kjeldahl Nitrogen	0.180	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144114	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P376071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144049	Total-P	0.290	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144140	O-Phosphate-P	0.544	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P375989

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144044	Color (true)	0.895	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P375990

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144112	Color (true)	5.49	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P376260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144357	Total Alkalinity	0.381	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P376421

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144117	TDS	4.16	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P376263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144357	Fluoride	0.482	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P376029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2144047	Organic Carbon	0.332	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A96350

Included Lab Sample IDs: 2144115, 2144116, 2144119

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	103	96.5	P/P	90 - 110
O-Phosphate-P	95.3	96.0	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A96397

Included Lab Sample IDs: 2144111, 2144112, 2144117

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

Reference Method: SM 5310 B-00

Run ID: A96415

Included Lab Sample IDs: 2144113, 2144114, 2144118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.4	95.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A96439

Included Lab Sample IDs: 2144124

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A96455

Included Lab Sample IDs: 2144113, 2144114, 2144118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A96461

Included Lab Sample IDs: 2144118

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A96479

Included Lab Sample IDs: 2144111, 2144112, 2144117

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	101	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A96486

Included Lab Sample IDs: 2144113, 2144114

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A96503

Included Lab Sample IDs: 2144113, 2144114, 2144118

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

Reference Method: SM 2320 B-97

Run ID: A96510

Included Lab Sample IDs: 2144111, 2144112, 2144117

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110
Total Alkalinity	104	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A96510

Included Lab Sample IDs: 2144111, 2144112, 2144117

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A96549

Included Lab Sample IDs: 2144113, 2144114, 2144118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	101	P/P	90 - 110
Ammonia-N	101	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A96565

Included Lab Sample IDs: 2144124

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	93.6	95.9	P/P	90 - 110
Antimony	103	104	P/P	90 - 110
Arsenic	99.6	101	P/P	90 - 110
Cadmium	103	105	P/P	90 - 110
Chromium	107	109	P/P	90 - 110
Copper	96.5	97.7	P/P	90 - 110
Lead	105	106	P/P	90 - 110
Nickel	96.5	97.6	P/P	90 - 110
Selenium	102	105	P/P	90 - 110
Thallium	91.0	92.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A96570

Included Lab Sample IDs: 2144111, 2144112, 2144117

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	96.6	97.6	P/P	90 - 110
Chloride	97.0	96.6	P/P	90 - 110
Sulfate	97.5	98.6	P/P	90 - 110
Sulfate	97.9	97.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A96610

Included Lab Sample IDs: 2144124

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A96637

Included Lab Sample IDs: 2144124

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	105	102	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					4.88	
EPA 200.7 Rev. 4.4	Barium	100	97.2	98.8	98.7		1.61
	Calcium	104	109	103			0.840
	Iron	104	104	104	102		0.179
	Magnesium	103	103	101			0.310
	Potassium	101	101	102	99.4		0.634
	Sodium	103	102	103	101		0.642
	Zinc	103	97.1	98.9	100		1.31
EPA 200.8 Rev. 5.4	Aluminum	97.7	94.3	91.9	93.1		2.57
	Antimony	105	106	108	107		1.53
	Arsenic	98.9	99.4	98.9	99.9		0.505
	Boron	109	104	104	109		0.0271
	Cadmium	103	103	102	103		0.592
	Chromium	99.5	103	102	103		1.44
	Copper	96.9	91.4	90.3	91.7		1.16
	Lead	107	109	109	109		0.103
	Nickel	97.5	94.4	93.0	93.5		1.43
	Selenium	98.7	93.3	92.4	95.8		0.861
	Silver	101	101	102	101		1.20
	Thallium	103	104	106	105		1.80
EPA 300.0 Rev. 2.1	Chloride	98.6	99.1	98.9		0.133	
	Chloride	99.6	99.9	99.9			0.0379
	Sulfate	99.3	99.4	99.9		0.0434	
	Sulfate	101	101	101			0.0274
EPA 350.1 Rev. 2.0	Ammonia-N	101	102	104			1.86
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	102	102			0.180
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	99.5	99.5			0.0
EPA 365.1 Rev. 2.0	Total-P	104	104	103			0.290
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	98.5	97.5			0.544
SM 2120 B	Color (true)	98.8				0.895	
	Color (true)	101				5.49	
SM 2320 B-97	Total Alkalinity	104				0.381	
SM 2540 C-97	TDS					4.16	
SM 4500 F-C-97	Fluoride	99.8	99.1	99.7			0.482
SM 5310 B-00	Organic Carbon	96.3	96.1	95.6			0.332

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2144111, 2144112, 2144117
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2144124
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2144124
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2144111, 2144112, 2144117
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2144111, 2144112, 2144117
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2144113, 2144114, 2144118
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2144113, 2144114, 2144118
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2144113, 2144114, 2144118

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2144113, 2144114, 2144118
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2144115, 2144116, 2144119
SM 2120 B / E31780	True Color measured at 450 nm	2144111, 2144112, 2144117
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2144111, 2144112, 2144117
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2144111, 2144112, 2144117
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2144111, 2144112, 2144117
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2144111, 2144112, 2144117
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2144113, 2144114, 2144118

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	12/13/2019			12/13/2019 17:27	Yen Ta	2144111, 2144112, 2144117
EPA 200.7 Rev. 4.4	12/13/2019	12/17/2019 15:50	Elliott D. Healy	12/18/2019 15:30	Betina Topolski	2144124
EPA 200.8 Rev. 5.4	12/13/2019	12/17/2019 15:50	Elliott D. Healy	12/24/2019 02:14	Justin Cutchin	2144124
	12/13/2019	12/17/2019 15:50	Elliott D. Healy	12/27/2019 18:35	Alexander Thompson	2144124
	12/13/2019	12/17/2019 15:50	Elliott D. Healy	12/30/2019 18:19	Alexander Thompson	2144124
EPA 300.0 Rev. 2.1	12/13/2019			12/25/2019 05:24	Jhamieka S. Greenwood	2144111
	12/13/2019			12/25/2019 05:41	Jhamieka S. Greenwood	2144112
	12/13/2019			12/25/2019 07:58	Jhamieka S. Greenwood	2144117
EPA 350.1 Rev. 2.0	12/13/2019			12/23/2019 11:44	Ping Hua	2144114
	12/13/2019			12/23/2019 11:45	Ping Hua	2144118
	12/13/2019			12/23/2019 14:50	Ping Hua	2144113
EPA 351.2 Rev. 2.0	12/13/2019	12/17/2019 12:25	Sima Feizi	12/18/2019 17:20	Jhamieka S. Greenwood	2144113
	12/13/2019	12/17/2019 12:25	Sima Feizi	12/18/2019 17:21	Jhamieka S. Greenwood	2144114
	12/13/2019	12/17/2019 12:25	Sima Feizi	12/18/2019 17:23	Jhamieka S. Greenwood	2144118
EPA 353.2 Rev. 2.0	12/13/2019			12/20/2019 10:44	Beverly Y. Sanders	2144114
	12/13/2019			12/20/2019 10:50	Beverly Y. Sanders	2144113
	12/13/2019			12/20/2019 10:51	Beverly Y. Sanders	2144118
EPA 365.1 Rev. 2.0	12/13/2019	12/18/2019 14:20	Lipi Saha	12/19/2019 11:04	Benjamin T. Nordmann	2144118
	12/13/2019	12/18/2019 14:20	Lipi Saha	12/19/2019 15:35	Benjamin T. Nordmann	2144113
	12/13/2019	12/18/2019 14:20	Lipi Saha	12/19/2019 15:36	Benjamin T. Nordmann	2144114
EPA 365.1 Rev. 2.0 dissolved	12/13/2019			12/13/2019 19:01	Samantha Davila	2144115
	12/13/2019			12/13/2019 19:02	Samantha Davila	2144119
	12/13/2019			12/13/2019 19:25	Samantha Davila	2144116
SM 2120 B	12/13/2019			12/13/2019 19:03	Madeline Funaro	2144112
	12/13/2019			12/13/2019 19:04	Madeline Funaro	2144117
	12/13/2019			12/13/2019 19:19	Madeline Funaro	2144111
SM 2320 B-97	12/13/2019			12/19/2019 11:22	Dale L. Simmons	2144111
	12/13/2019			12/19/2019 11:33	Dale L. Simmons	2144112
	12/13/2019			12/19/2019 12:26	Dale L. Simmons	2144117
SM 2540 C-97	12/13/2019			12/17/2019 16:36	Yijie Li	2144111, 2144112, 2144117
SM 2540 D-97	12/13/2019			12/17/2019 16:36	Yijie Li	2144111, 2144112, 2144117
SM 4500 F-C-97	12/13/2019			12/19/2019 11:22	Dale L. Simmons	2144111
	12/13/2019			12/19/2019 11:33	Dale L. Simmons	2144112
	12/13/2019			12/19/2019 12:26	Dale L. Simmons	2144117
SM 5310 B-00	12/13/2019			12/18/2019 01:32	Madeline Funaro	2144113
	12/13/2019			12/18/2019 01:46	Madeline Funaro	2144114
	12/13/2019			12/18/2019 01:59	Madeline Funaro	2144118