Chemical Analysis Report

NE-DIST-2019-08-02-03

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-2019-07-29-11**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 23-AUG-2019 10:35

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: 08/01/2019 10:25**

Field ID: G2NE1132 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2108367	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P368413	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P368655	
		Sulfate	3.0		mg SO4/L	P368657	
	SM 2120 B	Color (true)	660		PCU	P368416	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P368838	
	SM 2540 C-97	TDS	94		mg/L	P368936	
	SM 2540 D-97	TSS	2	U	mg/L	P368922	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P368841	
2108368	EPA 350.1 Rev. 2.0	Ammonia-N	0.88		mg N/L	P368825	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.1		mg N/L	P369038	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P368449	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P368507	
	SM 5310 B-00	Organic Carbon	41		mg C/L	P368484	
2108369	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P368408	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
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: 08/01/2019 11:45**

Field ID: G2NE1187 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2108370	EPA 180.1 Rev. 2.0	Turbidity	4.2		NTU	P368413	
	EPA 300.0 Rev. 2.1	Chloride	260		mg Cl/L	P368655	
		Sulfate	78		mg SO4/L	P368657	
	SM 2120 B	Color (true)	61	A	PCU	P368417	
	SM 2320 B-97	Total Alkalinity	87		mg CaCO3/L	P368838	
	SM 2540 C-97	TDS	678		mg/L	P368936	
	SM 2540 D-97	TSS	10		mg/L	P368922	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P368841	
2108371	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P368825	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P369038	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P368449	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P368507	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P368484	
2108372	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P368408	
2108376	EPA 200.7 Rev. 4.4	Barium	22.7		ug/L	P368521	
		Calcium	60.8		mg/L	P368521	
		Iron	130		ug/L	P368521	
		Magnesium	21.9		mg/L	P368521	
		Potassium	5.1		mg/L	P368521	
		Sodium	142		mg/L	P368521	
		Zinc	5.0	U	ug/L	P368521	
	EPA 200.8 Rev. 5.4	Aluminum	60		ug/L	P368521	
		Antimony	0.057	I	ug/L	P368521	
		Arsenic	1.18		ug/L	P368521	
		Boron**	62.4		ug/L	P368521	
		Cadmium	0.020	U	ug/L	P368521	
		Chromium	0.40	U	ug/L	P368521	
		Copper	0.40	U	ug/L	P368521	
		Lead	0.20	I	ug/L	P368521	
		Nickel	0.50	U	ug/L	P368521	
		Selenium	0.20	U	ug/L	P368521	
		Silver	0.010	U	ug/L	P368521	
		Thallium	0.10	U	ug/L	P368521	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
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: P368413

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P368521

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: P368521

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: P368655

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368657

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368825

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: P369038

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368449

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368507

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368408

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

Reference Method: SM 2120 B
Batch ID: P368416

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P368417

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P368838

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

Reference Method: SM 2540 C-97
Batch ID: P368936

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P368922

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P368841

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P368484

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: P368521

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	104		P	85 - 115
Iron	105		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	99.8		P	85 - 115
Sodium	98.3		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P368521

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.3		P	85 - 115
Antimony	98.1		P	85 - 115
Arsenic	99.8		P	85 - 115
Boron	98.4		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	97.3		P	85 - 115
Copper	97.4		P	85 - 115
Lead	99.8		P	85 - 115
Nickel	98.5		P	85 - 115
Selenium	99.1		P	85 - 115
Silver	102		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368655

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	94.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368657

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368825

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: P369038

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368449

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368507

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368408

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

Reference Method: SM 2120 B
Batch ID: P368416

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2120 B
Batch ID: P368417

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	103		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P368838

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

Reference Method: SM 4500 F-C-97
Batch ID: P368841

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P368484

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: P368521

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107747	Barium	98.2		P	80 - 120
2107747	Calcium	101		P	80 - 120
2107747	Iron	104		P	80 - 120
2107747	Magnesium	101		P	80 - 120
2107747	Potassium	98.8		P	80 - 120
2107747	Sodium	97.5		P	80 - 120
2107747	Zinc	97.4		P	80 - 120
2108405	Barium	96.5	95.8	P/P	80 - 120
2108405	Calcium	99.4		P	80 - 120
2108405	Iron	106	103	P/P	80 - 120
2108405	Magnesium	99.3		P	80 - 120
2108405	Potassium	97.3	96.8	P/P	80 - 120
2108405	Sodium	90.8	89.4	P/P	80 - 120
2108405	Zinc	97.3	96.0	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P368521

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107747	Aluminum	97.5		P	80 - 120
2107747	Antimony	100		P	80 - 120
2107747	Arsenic	101		P	80 - 120
2107747	Boron	102		P	80 - 120
2107747	Cadmium	99.8		P	80 - 120
2107747	Chromium	99.1		P	80 - 120
2107747	Copper	95.3		P	80 - 120
2107747	Lead	101		P	80 - 120
2107747	Nickel	97.0		P	80 - 120
2107747	Selenium	99.6		P	80 - 120
2107747	Silver	102		P	80 - 120
2107747	Thallium	102		P	80 - 120
2108405	Aluminum	100	97.9	P/P	80 - 120
2108405	Antimony	101	98.5	P/P	80 - 120
2108405	Arsenic	101	98.6	P/P	80 - 120
2108405	Boron	104	100	P/P	80 - 120
2108405	Cadmium	102	98.4	P/P	80 - 120
2108405	Chromium	97.5	95.8	P/P	80 - 120
2108405	Copper	95.6	93.6	P/P	80 - 120
2108405	Lead	101	99.7	P/P	80 - 120
2108405	Nickel	97.5	95.1	P/P	80 - 120
2108405	Selenium	101	97.0	P/P	80 - 120
2108405	Silver	103	101	P/P	80 - 120
2108405	Thallium	102	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368655

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2108309	Chloride	95.5		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368657

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2108309	Sulfate	100		P	90 - 110
2108333	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368825

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2108324	Ammonia-N	95.4	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369038

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2108334	Kjeldahl Nitrogen	100	93.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368449

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2108334	NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368507

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2108321	Total-P	96.7	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368408

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2108311	O-Phosphate-P	95.2	96.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P368841

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2107167	Fluoride	97.5	95.8	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P368484

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2108327	Organic Carbon	103	103	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P368413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108323	Turbidity	6.11	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P368521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108405	Barium	0.684	Spike	P	0 - 20
2108405	Calcium	0.337	Spike	P	0 - 20
2108405	Iron	2.58	Spike	P	0 - 20
2108405	Magnesium	0.00378	Spike	P	0 - 20
2108405	Potassium	0.473	Spike	P	0 - 20
2108405	Sodium	0.762	Spike	P	0 - 20
2108405	Zinc	1.34	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P368521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108405	Aluminum	2.38	Spike	P	0 - 20
2108405	Antimony	2.38	Spike	P	0 - 20
2108405	Arsenic	2.38	Spike	P	0 - 20
2108405	Boron	3.63	Spike	P	0 - 20
2108405	Cadmium	3.58	Spike	P	0 - 20
2108405	Chromium	1.69	Spike	P	0 - 20
2108405	Copper	2.11	Spike	P	0 - 20
2108405	Lead	1.52	Spike	P	0 - 20
2108405	Nickel	2.45	Spike	P	0 - 20
2108405	Selenium	3.84	Spike	P	0 - 20
2108405	Silver	2.00	Spike	P	0 - 20
2108405	Thallium	0.933	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368655

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108309	Chloride	0.576	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P368657

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108309	Sulfate	0.117	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P368825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108324	Ammonia-N	4.41	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108334	Kjeldahl Nitrogen	4.29	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P368449

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108334	NO2NO3-N	0.985	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P368507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108321	Total-P	0.809	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P368408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108311	O-Phosphate-P	0.941	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P368416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108332	Color (true)	0.680	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P368417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108370	Color (true)	1.24	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P368838

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2107167	Total Alkalinity	0.297	Sample	P	0 - 2.8

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P368936

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108309	TDS	4.83	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P368841

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2107167	Fluoride	1.48	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P368484

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2108327	Organic Carbon	0.293	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 365.1 Rev. 2.0 dissolved
Run ID: A93240
Included Lab Sample IDs: 2108369, 2108372

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A93241
Included Lab Sample IDs: 2108367, 2108370

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

Reference Method: SM 2120 B
Run ID: A93242
Included Lab Sample IDs: 2108367, 2108370

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 115
Color (true)	103	104	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A93267
Included Lab Sample IDs: 2108368, 2108371

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

Reference Method: SM 5310 B-00
Run ID: A93280
Included Lab Sample IDs: 2108368, 2108371

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A93323
Included Lab Sample IDs: 2108368, 2108371

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.0	97.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A93324
Included Lab Sample IDs: 2108367, 2108370

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.2	97.4	P/P	90 - 110
Sulfate	102	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A93414
Included Lab Sample IDs: 2108368, 2108371

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A93414
Included Lab Sample IDs: 2108368, 2108371

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	105	103	P/P	90 - 110
Ammonia-N	106	103	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A93419
Included Lab Sample IDs: 2108367, 2108370

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: A93419
Included Lab Sample IDs: 2108367, 2108370

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.1	99.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A93446
Included Lab Sample IDs: 2108376

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.4	101	P/P	90 - 110
Antimony	95.9	95.9	P/P	90 - 110
Arsenic	99.7	98.5	P/P	90 - 110
Boron	97.6	106	P/P	90 - 110
Cadmium	98.1	98.8	P/P	90 - 110
Chromium	98.7	96.9	P/P	90 - 110
Copper	99.1	98.5	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Nickel	99.8	98.5	P/P	90 - 110
Selenium	97.3	97.7	P/P	90 - 110
Silver	104	104	P/P	90 - 110
Thallium	97.2	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A93572
Included Lab Sample IDs: 2108368, 2108371

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.4	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A93692
Included Lab Sample IDs: 2108376

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	96.2	P/P	90 - 110
Calcium	102	104	P/P	90 - 110
Iron	104	104	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A93692
Included Lab Sample IDs: 2108376

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Potassium	99.3	99.1	P/P	90 - 110
Sodium	96.3	97.7	P/P	90 - 110
Zinc	102	99.0	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		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						6.11	
EPA 200.7 Rev. 4.4	Barium	101	98.2	96.5	95.8			0.684
	Calcium	104	101	99.4				0.337
	Iron	105	104	106	103			2.58
	Magnesium	103	101	99.3				0.0037
	Potassium	99.8	98.8	97.3	96.8			0.473
	Sodium	98.3	97.5	90.8	89.4			0.762
	Zinc	102	97.4	97.3	96.0			1.34
EPA 200.8 Rev. 5.4	Aluminum	96.3	97.5	100	97.9			2.38
	Antimony	98.1	100	101	98.5			2.38
	Arsenic	99.8	101	101	98.6			2.38
	Boron	98.4	102	104	100			3.63
	Cadmium	100	99.8	102	98.4			3.58
	Chromium	97.3	99.1	97.5	95.8			1.69
	Copper	97.4	95.3	95.6	93.6			2.11
	Lead	99.8	101	101	99.7			1.52
	Nickel	98.5	97.0	97.5	95.1			2.45
	Selenium	99.1	99.6	101	97.0			3.84
	Silver	102	103	101	102			2.00
	Thallium	100	102	102	101			0.933
EPA 300.0 Rev. 2.1	Chloride	94.7	95.5				0.576	
	Sulfate	98.8	100	101			0.117	
EPA 350.1 Rev. 2.0	Ammonia-N	101	95.4	102				4.41
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	100	93.0				4.29
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	101				0.985
EPA 365.1 Rev. 2.0	Total-P	98.1	96.7	95.8				0.809
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.5	95.2	96.1				0.941
SM 2120 B	Color (true)	104					0.680	
	Color (true)	103					1.24	
SM 2320 B-97	Total Alkalinity	104					0.297	
SM 2540 C-97	TDS						4.83	
SM 4500 F-C-97	Fluoride	100	97.5	95.8				1.48
SM 5310 B-00	Organic Carbon	102	103	103				0.293

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2108367, 2108370
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2108376
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2108376
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2108367, 2108370
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2108367, 2108370
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2108368, 2108371
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2108368, 2108371
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2108368, 2108371
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2108368, 2108371

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	2108369, 2108372
SM 2120 B / E31780	True Color measured at 450 nm	2108367, 2108370
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2108367, 2108370
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2108367, 2108370
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2108367, 2108370
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2108367, 2108370
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2108368, 2108371

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	08/02/2019			08/02/2019 16:57	Adrian Shelby	2108367, 2108370
EPA 200.7 Rev. 4.4	08/02/2019	08/06/2019 16:50	Elliott D. Healy	08/21/2019 12:27	Betina Topolski	2108376
EPA 200.8 Rev. 5.4	08/02/2019	08/06/2019 16:50	Elliott D. Healy	08/12/2019 23:47	Martin Acosta	2108376
EPA 300.0 Rev. 2.1	08/02/2019			08/07/2019 16:21	Jhamieka S. Greenwood	2108367
	08/02/2019			08/07/2019 16:33	Jhamieka S. Greenwood	2108370
EPA 350.1 Rev. 2.0	08/02/2019			08/11/2019 12:34	Ping Hua	2108371
	08/02/2019			08/11/2019 13:55	Ping Hua	2108368
EPA 351.2 Rev. 2.0	08/02/2019	08/14/2019 14:55	Sima Feizi	08/15/2019 17:18	Julia Storbeck	2108368
	08/02/2019	08/14/2019 14:55	Sima Feizi	08/15/2019 17:19	Julia Storbeck	2108371
EPA 353.2 Rev. 2.0	08/02/2019			08/05/2019 11:06	Beverly Y. Sanders	2108368
	08/02/2019			08/05/2019 11:08	Beverly Y. Sanders	2108371
EPA 365.1 Rev. 2.0	08/02/2019	08/06/2019 13:26	Vijayalakshmi Reddy	08/07/2019 11:54	Lipi Saha	2108368
	08/02/2019	08/06/2019 13:26	Vijayalakshmi Reddy	08/07/2019 11:55	Lipi Saha	2108371
EPA 365.1 Rev. 2.0 dissolved	08/02/2019			08/02/2019 16:18	Jhamieka S. Greenwood	2108369
	08/02/2019			08/02/2019 16:19	Jhamieka S. Greenwood	2108372
SM 2120 B	08/02/2019			08/02/2019 16:57	Madeline Funaro	2108370
	08/02/2019			08/02/2019 17:12	Madeline Funaro	2108367
SM 2320 B-97	08/02/2019			08/09/2019 10:56	Dale L. Simmons	2108367
	08/02/2019			08/09/2019 11:35	Dale L. Simmons	2108370
SM 2540 C-97	08/02/2019			08/07/2019 15:21	Yijie Li	2108367, 2108370
SM 2540 D-97	08/02/2019			08/07/2019 15:21	Yijie Li	2108367, 2108370
SM 4500 F-C-97	08/02/2019			08/09/2019 10:56	Dale L. Simmons	2108367
	08/02/2019			08/09/2019 11:35	Dale L. Simmons	2108370
SM 5310 B-00	08/02/2019			08/06/2019 00:13	Madeline Funaro	2108368
	08/02/2019			08/06/2019 00:25	Madeline Funaro	2108371