Chemical Analysis Report

NE-DIST-2019-04-09-01

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

Event Description: **LSJR Lake**
Request ID: **RQ-2019-04-08-15**
Customer: **NE-DIST**
Project ID: **SMP**

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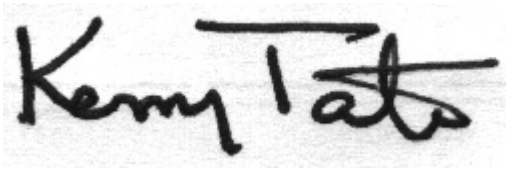
Date Certified: 23-APR-2019 11:04



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: LAKE LILLIE CENTER **Collection Date/Time: 04/08/2019 11:20**

Field ID: G2NE1133 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2076390	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P361818	
	EPA 300.0 Rev. 2.1	Chloride	15	A	mg Cl/L	P362267	
		Sulfate	20	A	mg SO4/L	P362270	
	SM 2120 B	Color (true)	30		PCU	P361860	
	SM 2320 B-97	Total Alkalinity	20		mg CaCO3/L	P362173	RPD
	SM 2540 C-97	TDS	88		mg/L	P362514	
	SM 2540 D-97	TSS	2	I	mg/L	P362231	
	SM 4500 F-C-97	Fluoride	0.080	I	mg F/L	P362179	
2076393	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P362283	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P362156	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P362328	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P362082	
	SM 5310 B-00	Organic Carbon	9.3		mg C/L	P361976	
2076396	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P361837	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: 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: SILVER LAKE CENTER **Collection Date/Time: 04/08/2019 12:05**

Field ID: G2NE1132 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2076391	EPA 180.1 Rev. 2.0	Turbidity	0.45		NTU	P361818	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P362267	
		Sulfate	3.9		mg SO4/L	P362270	
	SM 2120 B	Color (true)	600		PCU	P361860	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P362173	RPD
	SM 2540 C-97	TDS	91		mg/L	P362514	
	SM 2540 D-97	TSS	2	U	mg/L	P362231	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P362179	
2076394	EPA 350.1 Rev. 2.0	Ammonia-N	1.0		mg N/L	P362283	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.0		mg N/L	P362156	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.066		mg N/L	P362328	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P362145	
	SM 5310 B-00	Organic Carbon	41		mg C/L	P361976	
2076397	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P361837	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: 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: LAKE COMO, CENTER **Collection Date/Time: 04/08/2019 12:35**

Field ID: 20030627 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2076392	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P361818	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P362267	
		Sulfate	8.5		mg SO4/L	P362270	
	SM 2120 B	Color (true)	32		PCU	P361860	
	SM 2320 B-97	Total Alkalinity	1.0	I	mg CaCO3/L	P362173	RPD
	SM 2540 C-97	TDS	45		mg/L	P362514	
	SM 2540 D-97	TSS	2	I	mg/L	P362231	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P362179	
2076395	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P362283	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P362156	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.072		mg N/L	P362328	
	EPA 365.1 Rev. 2.0	Total-P	0.008		mg P/L	P362145	
	SM 5310 B-00	Organic Carbon	6.8		mg C/L	P361976	
2076398	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P361837	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: 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: 04/08/2019 10:20**

Field ID: G2NE1187 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2076387	EPA 180.1 Rev. 2.0	Turbidity	4.8		NTU	P361818	
	EPA 300.0 Rev. 2.1	Chloride	160		mg Cl/L	P362267	
		Sulfate	46		mg SO4/L	P362270	
	SM 2120 B	Color (true)	190		PCU	P361860	
	SM 2320 B-97	Total Alkalinity	54		mg CaCO3/L	P362173	RPD
	SM 2540 C-97	TDS	430	A	mg/L	P362514	
	SM 2540 D-97	TSS	7	IA	mg/L	P362231	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P362179	
2076388	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P362282	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P362156	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.062		mg N/L	P362328	
	EPA 365.1 Rev. 2.0	Total-P	0.068		mg P/L	P362082	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P361976	
2076389	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P361837	
2076405	EPA 200.7 Rev. 4.4	Barium	13.7		ug/L	P361813	
		Calcium	40.4		mg/L	P361813	
		Iron	430		ug/L	P361813	
		Magnesium	13.5		mg/L	P361813	
		Potassium	3.3		mg/L	P361813	
		Sodium	80.7		mg/L	P361813	
		Zinc	5.0	U	ug/L	P361813	
	EPA 200.8 Rev. 5.4	Aluminum	136		ug/L	P361813	
		Antimony	0.059	I	ug/L	P361813	
		Arsenic	1.09		ug/L	P361813	
		Boron**	43.9		ug/L	P361813	
		Cadmium	0.020	U	ug/L	P361813	
		Chromium	0.54	I	ug/L	P361813	
		Copper	0.59	I	ug/L	P361813	
		Lead	0.41		ug/L	P361813	
		Nickel	0.50	U	ug/L	P361813	
		Selenium	0.21	I	ug/L	P361813	
		Silver	0.010	U	ug/L	P361813	
		Thallium	0.10	U	ug/L	P361813	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: 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.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P361818

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P361813

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: P361813

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: P362267

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362270

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362282

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362283

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362156

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362328

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362082

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362145

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361837

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

Reference Method: SM 2120 B
Batch ID: P361860

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P362173

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

Reference Method: SM 2540 C-97
Batch ID: P362514

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P362231

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P362179

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P361976

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: P361813

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	103		P	85 - 115
Calcium	102		P	85 - 115
Iron	108		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	100		P	85 - 115
Sodium	97.3		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P361813

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.9		P	85 - 115
Antimony	96.3		P	85 - 115
Arsenic	103		P	85 - 115
Boron	100		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	94.4		P	85 - 115
Copper	99.7		P	85 - 115
Lead	96.3		P	85 - 115
Nickel	101		P	85 - 115
Selenium	102		P	85 - 115
Silver	96.0		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362267

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362270

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362282

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362283

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362156

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362328

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362082

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362145

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: P361837

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

Reference Method: SM 2120 B
Batch ID: P361860

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.9		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P362173

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P362179

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P361976

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: P361813

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075767	Barium	98.2	98.1	P/P	80 - 120
2075767	Iron	104	105	P/P	80 - 120
2075767	Magnesium	103		P	80 - 120
2075767	Potassium	101		P	80 - 120
2075767	Sodium	98.5		P	80 - 120
2075767	Zinc	103	103	P/P	80 - 120
2076521	Barium	103		P	80 - 120
2076521	Calcium	101		P	80 - 120
2076521	Iron	107		P	80 - 120
2076521	Magnesium	102		P	80 - 120
2076521	Potassium	100		P	80 - 120
2076521	Sodium	101		P	80 - 120
2076521	Zinc	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P361813

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075767	Aluminum	98.9	100	P/P	80 - 120
2075767	Antimony	99.6	100	P/P	80 - 120
2075767	Arsenic	106	106	P/P	80 - 120
2075767	Boron	102	106	P/P	80 - 120
2075767	Cadmium	104	104	P/P	80 - 120
2075767	Chromium	91.2	92.1	P/P	80 - 120
2075767	Copper	96.7	97.3	P/P	80 - 120
2075767	Lead	97.9	99.3	P/P	80 - 120
2075767	Nickel	97.5	98.6	P/P	80 - 120
2075767	Selenium	105	106	P/P	80 - 120
2075767	Silver	94.5	95.1	P/P	80 - 120
2075767	Thallium	105	106	P/P	80 - 120
2076521	Aluminum	99.3		P	80 - 120
2076521	Antimony	98.7		P	80 - 120
2076521	Arsenic	103		P	80 - 120
2076521	Boron	103		P	80 - 120
2076521	Cadmium	103		P	80 - 120
2076521	Chromium	94.5		P	80 - 120
2076521	Copper	96.3		P	80 - 120
2076521	Lead	97.3		P	80 - 120
2076521	Nickel	101		P	80 - 120
2076521	Selenium	101		P	80 - 120
2076521	Silver	96.3		P	80 - 120
2076521	Thallium	104		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362267

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076390	Chloride	106		P	90 - 110
2076511	Chloride	108		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362270

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076390	Sulfate	107		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076333	Ammonia-N	99.7	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362283

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076393	Ammonia-N	102	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362156

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076393	Kjeldahl Nitrogen	106	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362328

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076378	NO2NO3-N	97.0	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362082

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076333	Total-P	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362145

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076395	Total-P	98.6	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076398	O-Phosphate-P	97.5	98.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P362179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076930	Fluoride	100	100	P/P	89 - 106

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P361976

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076492	Organic Carbon	102	95.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P361818

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076375	Turbidity	1.46	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P361813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075767	Barium	0.168	Spike	P	0 - 20
2075767	Calcium	1.64	Spike	P	0 - 20
2075767	Iron	0.434	Spike	P	0 - 20
2075767	Magnesium	0.752	Spike	P	0 - 20
2075767	Potassium	0.514	Spike	P	0 - 20
2075767	Sodium	0.0134	Spike	P	0 - 20
2075767	Zinc	0.332	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P361813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075767	Aluminum	1.15	Spike	P	0 - 20
2075767	Antimony	0.649	Spike	P	0 - 20
2075767	Arsenic	0.477	Spike	P	0 - 20
2075767	Boron	2.55	Spike	P	0 - 20
2075767	Cadmium	0.240	Spike	P	0 - 20
2075767	Chromium	0.917	Spike	P	0 - 20
2075767	Copper	0.656	Spike	P	0 - 20
2075767	Lead	1.44	Spike	P	0 - 20
2075767	Nickel	1.03	Spike	P	0 - 20
2075767	Selenium	0.456	Spike	P	0 - 20
2075767	Silver	0.611	Spike	P	0 - 20
2075767	Thallium	1.52	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362267

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076390	Chloride	9.70	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076390	Sulfate	9.97	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076333	Ammonia-N	1.51	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P362283

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076393	Ammonia-N	3.10	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362156

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076393	Kjeldahl Nitrogen	1.49	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362328

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076378	NO2NO3-N	1.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362082

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076333	Total-P	0.956	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362145

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076395	Total-P	0.764	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076398	O-Phosphate-P	0.613	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P361860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076367	Color (true)	0.406	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P362173

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076930	Total Alkalinity	8.08	Sample	F	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P362514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076387	TDS	5.12	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P362179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076930	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P361976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076492	Organic Carbon	3.46	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: A90551
Included Lab Sample IDs: 2076387, 2076390, 2076391, 2076392

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A90555
Included Lab Sample IDs: 2076389, 2076396, 2076397, 2076398

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	98.4	P/P	90 - 110
O-Phosphate-P	99.0	98.8	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A90564
Included Lab Sample IDs: 2076387, 2076390, 2076391, 2076392

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115
Color (true)	103	104	P/P	90 - 115
Color (true)	104	103	P/P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A90595
Included Lab Sample IDs: 2076405

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	102	P/P	90 - 110
Calcium	102	102	P/P	90 - 110
Iron	105	104	P/P	90 - 110
Magnesium	104	103	P/P	90 - 110
Potassium	100	99.6	P/P	90 - 110
Sodium	98.2	100	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A90618
Included Lab Sample IDs: 2076388, 2076393, 2076394, 2076395

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

Reference Method: SM 2320 B-97
Run ID: A90703
Included Lab Sample IDs: 2076387, 2076390, 2076391, 2076392

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	97.7	P/P	90 - 110
Total Alkalinity	97.5	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A90703
Included Lab Sample IDs: 2076387, 2076390, 2076391, 2076392

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A90722
Included Lab Sample IDs: 2076388

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A90727
Included Lab Sample IDs: 2076393

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A90751
Included Lab Sample IDs: 2076388, 2076393, 2076394, 2076395

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.6	97.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A90756
Included Lab Sample IDs: 2076394, 2076395

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A90760
Included Lab Sample IDs: 2076387, 2076390, 2076391, 2076392

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	99.5	P/P	90 - 110
Sulfate	102	99.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A90762
Included Lab Sample IDs: 2076388, 2076393, 2076394, 2076395

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.7	P/P	90 - 110
Ammonia-N	102	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A90779
Included Lab Sample IDs: 2076388, 2076393, 2076394, 2076395

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	98.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A90808
Included Lab Sample IDs: 2076405

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	102	P/P	90 - 110
Antimony	97.4	100	P/P	90 - 110
Arsenic	99.8	102	P/P	90 - 110
Boron	99.6	101	P/P	90 - 110
Cadmium	99.0	102	P/P	90 - 110
Chromium	98.4	101	P/P	90 - 110
Copper	98.7	101	P/P	90 - 110
Lead	95.6	97.8	P/P	90 - 110
Nickel	98.8	101	P/P	90 - 110
Selenium	101	104	P/P	90 - 110
Silver	95.8	98.3	P/P	90 - 110
Thallium	98.0	99.7	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						1.46	
EPA 200.7 Rev. 4.4	Barium	103	98.2	98.1	103			0.168
	Calcium	102	101					1.64
	Iron	108	104	105	107			0.434
	Magnesium	104	103	102				0.752
	Potassium	100	101	100				0.514
	Sodium	97.3	98.5	101				0.0134
	Zinc	105	103	103	104			0.332
EPA 200.8 Rev. 5.4	Aluminum	99.9	98.9	100	99.3			1.15
	Antimony	96.3	99.6	100	98.7			0.649
	Arsenic	103	106	106	103			0.477
	Boron	100	102	106	103			2.55
	Cadmium	100	104	104	103			0.240
	Chromium	94.4	91.2	92.1	94.5			0.917
	Copper	99.7	96.7	97.3	96.3			0.656
	Lead	96.3	97.9	99.3	97.3			1.44
	Nickel	101	97.5	98.6	101			1.03
	Selenium	102	105	106	101			0.456
	Silver	96.0	94.5	95.1	96.3			0.611
	Thallium	101	105	106	104			1.52
EPA 300.0 Rev. 2.1	Chloride	103	106	108			9.70	
	Sulfate	105	107				9.97	
EPA 350.1 Rev. 2.0	Ammonia-N	99.9	99.7	101				1.51
	Ammonia-N	102	102	105				3.10
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	106	103				1.49
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	97.0	98.0				1.03
EPA 365.1 Rev. 2.0	Total-P	103	100	101				0.956
	Total-P	104	98.6	99.3				0.764
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	97.5	98.1				0.613
SM 2120 B	Color (true)	99.9					0.406	
SM 2320 B-97	Total Alkalinity	101					8.08	
SM 2540 C-97	TDS						5.12	
SM 4500 F-C-97	Fluoride	99.5	100	100				0.0
SM 5310 B-00	Organic Carbon	102	102	95.8				3.46

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2076387, 2076390, 2076391, 2076392
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2076405
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2076405
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2076387, 2076390, 2076391, 2076392
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2076387, 2076390, 2076391, 2076392
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2076388, 2076393, 2076394, 2076395
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2076388, 2076393, 2076394, 2076395
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2076388, 2076393, 2076394, 2076395

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	2076388, 2076393, 2076394, 2076395
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2076389, 2076396, 2076397, 2076398
SM 2120 B / E31780	True Color measured at 450 nm	2076387, 2076390, 2076391, 2076392
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2076387, 2076390, 2076391, 2076392
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2076387, 2076390, 2076391, 2076392
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2076387, 2076390, 2076391, 2076392
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2076387, 2076390, 2076391, 2076392
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2076388, 2076393, 2076394, 2076395

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	04/09/2019			04/09/2019 15:54	Adrian Shelby	2076387, 2076390, 2076391, 2076392
EPA 200.7 Rev. 4.4	04/09/2019	04/09/2019 15:20	Elliott D. Healy	04/10/2019 15:17	Betina Topolski	2076405
EPA 200.8 Rev. 5.4	04/09/2019	04/09/2019 15:20	Elliott D. Healy	04/17/2019 21:56	Martin Acosta	2076405
EPA 300.0 Rev. 2.1	04/09/2019			04/15/2019 18:47	Julia Storbeck	2076390
	04/09/2019			04/15/2019 19:35	Julia Storbeck	2076387
	04/09/2019			04/15/2019 19:59	Julia Storbeck	2076391
	04/09/2019			04/15/2019 20:11	Julia Storbeck	2076392
EPA 350.1 Rev. 2.0	04/09/2019			04/15/2019 11:21	Ping Hua	2076388
	04/09/2019			04/15/2019 11:27	Ping Hua	2076393
	04/09/2019			04/15/2019 13:38	Ping Hua	2076394
	04/09/2019			04/15/2019 13:39	Ping Hua	2076395
EPA 351.2 Rev. 2.0	04/09/2019	04/15/2019 14:15	Jhamieka S. Greenwood	04/16/2019 13:31	Joseph Suarez	2076388
	04/09/2019	04/15/2019 14:15	Jhamieka S. Greenwood	04/16/2019 13:32	Joseph Suarez	2076393
	04/09/2019	04/15/2019 14:15	Jhamieka S. Greenwood	04/16/2019 13:37	Joseph Suarez	2076394
	04/09/2019	04/15/2019 14:15	Jhamieka S. Greenwood	04/16/2019 13:39	Joseph Suarez	2076395
EPA 353.2 Rev. 2.0	04/09/2019			04/17/2019 09:13	Beverly Y. Sanders	2076388
	04/09/2019			04/17/2019 09:14	Beverly Y. Sanders	2076393
	04/09/2019			04/17/2019 09:15	Beverly Y. Sanders	2076394
	04/09/2019			04/17/2019 09:17	Beverly Y. Sanders	2076395
EPA 365.1 Rev. 2.0	04/09/2019	04/12/2019 15:40	Sima Feizi	04/15/2019 14:39	Rosalyn Ballman	2076388
	04/09/2019	04/12/2019 15:40	Sima Feizi	04/15/2019 18:28	Rosalyn Ballman	2076393
	04/09/2019	04/15/2019 13:05	Sima Feizi	04/16/2019 15:16	Rosalyn Ballman	2076395
	04/09/2019	04/15/2019 13:05	Sima Feizi	04/16/2019 15:17	Rosalyn Ballman	2076394
EPA 365.1 Rev. 2.0 dissolved	04/09/2019			04/09/2019 16:27	Julia Storbeck	2076398
	04/09/2019			04/09/2019 17:06	Julia Storbeck	2076389
	04/09/2019			04/09/2019 17:07	Julia Storbeck	2076396, 2076397
SM 2120 B	04/09/2019			04/09/2019 15:41	Mariam Hanna	2076390
	04/09/2019			04/09/2019 15:42	Mariam Hanna	2076392
	04/09/2019			04/09/2019 16:17	Mariam Hanna	2076387
	04/09/2019			04/09/2019 16:28	Mariam Hanna	2076391
SM 2320 B-97	04/09/2019			04/13/2019 11:07	Dale L. Simmons	2076387
	04/09/2019			04/13/2019 11:23	Dale L. Simmons	2076390
	04/09/2019			04/13/2019 11:32	Dale L. Simmons	2076391
	04/09/2019			04/13/2019 12:10	Dale L. Simmons	2076392
SM 2540 C-97	04/09/2019			04/11/2019 16:14	Yijie Li	2076387, 2076390, 2076391, 2076392
SM 2540 D-97	04/09/2019			04/11/2019 16:14	Yijie Li	2076387, 2076390, 2076391, 2076392
SM 4500 F-C-97	04/09/2019			04/13/2019 11:07	Dale L. Simmons	2076387
	04/09/2019			04/13/2019 11:23	Dale L. Simmons	2076390
	04/09/2019			04/13/2019 11:32	Dale L. Simmons	2076391
	04/09/2019			04/13/2019 12:10	Dale L. Simmons	2076392

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	04/09/2019			04/10/2019 16:54	Julia Storbeck	2076388
	04/09/2019			04/10/2019 17:06	Julia Storbeck	2076393
	04/09/2019			04/10/2019 17:18	Julia Storbeck	2076394
	04/09/2019			04/10/2019 17:30	Julia Storbeck	2076395