Chemical Analysis Report

NW-DIST-2019-02-19-02

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

Event Description: **Escambia River Run**
Request ID: **RQ-2019-01-28-09**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 308
Pensacola, FL 32502-5794
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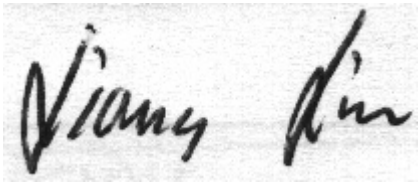
Certified by: Liang Lin, Environmental Administrator

Date Certified: 08-MAR-2019 10:03



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: Escambia River downstream of Tenmile Creek **Collection Date/Time: 02/18/2019 13:20**

Field ID: G4NW0006 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2063477	EPA 180.1 Rev. 2.0	Turbidity	19	A	NTU	P359191	
	EPA 300.0 Rev. 2.1	Chloride	5.2		mg Cl/L	P359739	
		Sulfate	6.6		mg SO4/L	P359741	
	SM 2120 B	Color (true)	25	A	PCU	P359187	
	SM 2320 B-97	Total Alkalinity	22		mg CaCO3/L	P359425	
	SM 2540 C-97	TDS	64		mg/L	P359536	
	SM 2540 D-97	TSS	11		mg/L	P359442	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P359429	
2063478	EPA 350.1 Rev. 2.0	Ammonia-N	0.034		mg N/L	P359379	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P359321	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.26		mg N/L	P359487	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P359307	
	SM 5310 B-00	Organic Carbon	4.3		mg C/L	P359683	
2063479	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P359178	
2063481	EPA 200.7 Rev. 4.4	Barium	26.6		ug/L	P359253	
		Calcium	9.19		mg/L	P359253	
		Iron	1.68E+03		ug/L	P359253	
		Magnesium	1.27		mg/L	P359253	
		Potassium	0.93	I	mg/L	P359253	
		Sodium	5.4		mg/L	P359253	
		Zinc	5.0	U	ug/L	P359253	
	EPA 200.8 Rev. 5.4	Aluminum	549		ug/L	P359253	
		Antimony	0.050	U	ug/L	P359253	
		Arsenic	0.68		ug/L	P359253	
		Boron**	9.7		ug/L	P359253	
		Cadmium	0.020	U	ug/L	P359253	
		Chromium	1.3	I	ug/L	P359253	
		Copper	0.56	I	ug/L	P359253	
		Lead	0.58		ug/L	P359912	
		Nickel	0.84	I	ug/L	P359253	
		Selenium	0.20	U	ug/L	P359253	
		Silver	0.010	U	ug/L	P359253	
		Thallium	0.10	U	ug/L	P359253	

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: P359191

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P359253

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: P359253

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
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 200.8 Rev. 5.4
Batch ID: P359912

Component	Result	Code	Units
Lead	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359739

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359741

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359379

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359379

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359321

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359487

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359307

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P359178

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

Reference Method: SM 2120 B
Batch ID: P359187

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P359425

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

Reference Method: SM 2540 C-97
Batch ID: P359536

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P359442

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P359429

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P359683

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: P359253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	103		P	85 - 115
Calcium	109		P	85 - 115
Iron	110		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	103		P	85 - 115
Sodium	100		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P359253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.4		P	85 - 115
Antimony	99.5		P	85 - 115
Arsenic	105		P	85 - 115
Boron	99.9		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	102		P	85 - 115
Copper	106		P	85 - 115
Nickel	102		P	85 - 115
Selenium	100		P	85 - 115
Silver	101		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P359912

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Lead	95.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359739

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359741

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359379

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359321

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359321

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359487

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359307

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P359178

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

Reference Method: SM 2120 B
Batch ID: P359187

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

Reference Method: SM 2320 B-97
Batch ID: P359425

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P359429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.3		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P359683

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.3		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P359253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063376	Barium	98.8		P	80 - 120
2063376	Calcium	104		P	80 - 120
2063376	Iron	106		P	80 - 120
2063376	Magnesium	104		P	80 - 120
2063376	Potassium	98.4		P	80 - 120
2063376	Sodium	99.7		P	80 - 120
2063376	Zinc	103		P	80 - 120
2063439	Barium	105	104	P/P	80 - 120
2063439	Calcium	111	108	P/P	80 - 120
2063439	Iron	112	110	P/P	80 - 120
2063439	Magnesium	116	113	P/P	80 - 120
2063439	Potassium	100	97.9	P/P	80 - 120
2063439	Sodium	99.6		P	80 - 120
2063439	Zinc	107	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P359253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063376	Aluminum	96.1		P	80 - 120
2063376	Antimony	103		P	80 - 120
2063376	Arsenic	108		P	80 - 120
2063376	Boron	102		P	80 - 120
2063376	Cadmium	105		P	80 - 120
2063376	Chromium	105		P	80 - 120
2063376	Copper	105		P	80 - 120
2063376	Nickel	103		P	80 - 120
2063376	Selenium	101		P	80 - 120
2063376	Silver	99.3		P	80 - 120
2063376	Thallium	112		P	80 - 120
2063439	Aluminum	94.9	95.8	P/P	80 - 120
2063439	Antimony	98.7	99.8	P/P	80 - 120
2063439	Arsenic	106	107	P/P	80 - 120
2063439	Boron	103	104	P/P	80 - 120
2063439	Cadmium	102	104	P/P	80 - 120
2063439	Chromium	108	109	P/P	80 - 120
2063439	Copper	111	113	P/P	80 - 120
2063439	Nickel	108	110	P/P	80 - 120
2063439	Selenium	97.5	97.9	P/P	80 - 120
2063439	Silver	99.5	101	P/P	80 - 120
2063439	Thallium	107	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P359912

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2065812	Lead	93.7		P	80 - 120
2065815	Lead	95.4	95.4	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359739

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063433	Chloride	104		P	90 - 110
2063517	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359741

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063433	Sulfate	103		P	90 - 110
2063517	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359379

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063478	Ammonia-N	102	96.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359321

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063397	Kjeldahl Nitrogen	95.4	90.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063478	NO2NO3-N	96.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359307

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063478	Total-P	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P359178

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063479	O-Phosphate-P	95.5	97.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P359429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063517	Fluoride	98.9	98.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P359683

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2063449	Organic Carbon	103		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P359191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063477	Turbidity	2.65	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P359253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063439	Barium	0.976	Spike	P	0 - 20
2063439	Calcium	1.83	Spike	P	0 - 20
2063439	Iron	1.96	Spike	P	0 - 20
2063439	Magnesium	1.60	Spike	P	0 - 20
2063439	Potassium	1.76	Spike	P	0 - 20
2063439	Sodium	0.485	Spike	P	0 - 20
2063439	Zinc	1.12	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P359253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063439	Aluminum	0.902	Spike	P	0 - 20
2063439	Antimony	1.11	Spike	P	0 - 20
2063439	Arsenic	0.988	Spike	P	0 - 20
2063439	Boron	0.813	Spike	P	0 - 20
2063439	Cadmium	2.01	Spike	P	0 - 20
2063439	Chromium	0.229	Spike	P	0 - 20
2063439	Copper	1.36	Spike	P	0 - 20
2063439	Nickel	1.49	Spike	P	0 - 20
2063439	Selenium	0.494	Spike	P	0 - 20
2063439	Silver	1.49	Spike	P	0 - 20
2063439	Thallium	0.702	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P359912

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2065815	Lead	0.0386	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063517	Chloride	0.0364	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P359741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063517	Sulfate	0.222	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P359379

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063478	Ammonia-N	2.95	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P359321

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063397	Kjeldahl Nitrogen	3.53	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P359487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063478	NO2NO3-N	0.219	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P359307

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063478	Total-P	0.595	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P359178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063479	O-Phosphate-P	1.48	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P359187

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063477	Color (true)	8.58	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P359425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063517	Total Alkalinity	0.279	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P359536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063487	TDS	3.92	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P359429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063517	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P359683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2063449	Organic Carbon	0.424	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: A89509
Included Lab Sample IDs: 2063479

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	100	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A89510
Included Lab Sample IDs: 2063477

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A89511
Included Lab Sample IDs: 2063477

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A89559
Included Lab Sample IDs: 2063481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	99.4	P/P	90 - 110
Calcium	100	101	P/P	90 - 110
Iron	104	104	P/P	90 - 110
Magnesium	104	104	P/P	90 - 110
Potassium	98.2	98.7	P/P	90 - 110
Sodium	95.3	96.0	P/P	90 - 110
Zinc	102	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A89571
Included Lab Sample IDs: 2063481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.8	94.6	P/P	90 - 110
Antimony	97.6	95.7	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Boron	98.9	101	P/P	90 - 110
Cadmium	97.9	96.9	P/P	90 - 110
Chromium	104	105	P/P	90 - 110
Copper	106	108	P/P	90 - 110
Nickel	103	104	P/P	90 - 110
Selenium	97.7	96.6	P/P	90 - 110
Silver	96.4	96.4	P/P	90 - 110
Thallium	98.1	99.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A89592
Included Lab Sample IDs: 2063478

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A89592
Included Lab Sample IDs: 2063478

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A89597
Included Lab Sample IDs: 2063478

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	98.2	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A89606
Included Lab Sample IDs: 2063477

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.4	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A89606
Included Lab Sample IDs: 2063477

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A89633
Included Lab Sample IDs: 2063478

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A89640
Included Lab Sample IDs: 2063478

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A89674
Included Lab Sample IDs: 2063477

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

Reference Method: SM 5310 B-00
Run ID: A89721
Included Lab Sample IDs: 2063478

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.0	93.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A89852
Included Lab Sample IDs: 2063481

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	94.7	91.8	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						2.65	
EPA 200.7 Rev. 4.4	Barium	103	98.8	105	104			0.976
	Calcium	109	104	111	108			1.83
	Iron	110	106	112	110			1.96
	Magnesium	112	104	116	113			1.60
	Potassium	103	98.4	100	97.9			1.76
	Sodium	100	99.7	99.6				0.485
	Zinc	104	103	107	106			1.12
EPA 200.8 Rev. 5.4	Aluminum	99.4	96.1	94.9	95.8			0.902
	Antimony	99.5	103	98.7	99.8			1.11
	Arsenic	105	108	106	107			0.988
	Boron	99.9	102	103	104			0.813
	Cadmium	101	105	102	104			2.01
	Chromium	102	105	108	109			0.229
	Copper	106	105	111	113			1.36
	Lead	95.0	93.7	95.4	95.4			0.0386
	Nickel	102	103	108	110			1.49
	Selenium	100	101	97.5	97.9			0.494
	Silver	101	99.3	99.5	101			1.49
	Thallium	102	112	107	107			0.702
EPA 300.0 Rev. 2.1	Chloride	104	101	104			0.0364	
	Sulfate	105	100	103			0.222	
EPA 350.1 Rev. 2.0	Ammonia-N	96.5	102	96.7				2.95
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	95.4	90.7				3.53
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	96.2					0.219
EPA 365.1 Rev. 2.0	Total-P	105	103	102				0.595
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.5	95.5	97.1				1.48
SM 2120 B	Color (true)	103					8.58	
SM 2320 B-97	Total Alkalinity	101					0.279	
SM 2540 C-97	TDS						3.92	
SM 4500 F-C-97	Fluoride	97.3	98.9	98.9				0.0
SM 5310 B-00	Organic Carbon	94.3	103					0.424

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2063477
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2063481
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2063481
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2063477
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2063477
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2063478
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2063478
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2063478
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2063478

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	2063479
SM 2120 B / E31780	True Color measured at 450 nm	2063477
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2063477
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2063477
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2063477
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2063477
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2063478

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	02/19/2019			02/19/2019 17:21	Adrian Shelby	2063477
EPA 200.7 Rev. 4.4	02/19/2019	02/20/2019 17:30	Elliott D. Healy	02/21/2019 13:47	Betina Topolski	2063481
EPA 200.8 Rev. 5.4	02/19/2019	02/20/2019 17:30	Elliott D. Healy	02/22/2019 00:45	Allison Taylor	2063481
	02/19/2019	03/05/2019 16:50	Elliott D. Healy	03/06/2019 17:10	Robert K Palmer	2063481
EPA 300.0 Rev. 2.1	02/19/2019			02/28/2019 13:57	Lipi Saha	2063477
EPA 350.1 Rev. 2.0	02/19/2019			02/22/2019 11:58	Ping Hua	2063478
EPA 351.2 Rev. 2.0	02/19/2019	02/21/2019 16:30	Adrian Shelby	02/22/2019 14:22	Joseph Suarez	2063478
EPA 353.2 Rev. 2.0	02/19/2019			02/25/2019 11:13	Beverly Y. Sanders	2063478
EPA 365.1 Rev. 2.0	02/19/2019	02/21/2019 13:10	Sima Feizi	02/22/2019 16:04	Rosalyn Ballman	2063478
EPA 365.1 Rev. 2.0 dissolved	02/19/2019			02/19/2019 14:29	Jhamieka S. Greenwood	2063479
SM 2120 B	02/19/2019			02/19/2019 17:14	Chelsea Hernandez	2063477
SM 2320 B-97	02/19/2019			02/23/2019 10:58	Lauren Lees	2063477
SM 2540 C-97	02/19/2019			02/20/2019 16:21	Yijie Li	2063477
SM 2540 D-97	02/19/2019			02/20/2019 16:21	Yijie Li	2063477
SM 4500 F-C-97	02/19/2019			02/23/2019 10:58	Lauren Lees	2063477
SM 5310 B-00	02/19/2019			02/27/2019 05:08	Chelsea Hernandez	2063478