Chemical Analysis Report

CEN-DIST-2017-09-22-01

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

Event Description: **Holiday Springs / Blue Springs**
Request ID: **RQ-2017-09-18-56**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 11-OCT-2017 14:48

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 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: Holiday Springs above Pump House **Collection Date/Time: 09/21/2017 10:43**

Field ID: G1CE0029 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931051	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P332116	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P332302	
		Sulfate	12		mg SO4/L	P332303	
	SM 2120 B	Color (true)	6.9		PCU	P332106	
	SM 2320 B-97	Total Alkalinity	112		mg CaCO3/L	P332210	
	SM 2540 C-97	TDS	164		mg/L	P332591	
	SM 2540 D-97	TSS	3	I	mg/L	P332585	
	SM 4500 F-C-97	Fluoride	0.099	I	mg F/L	P332211	RPD
1931052	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P332337	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.12	I	mg N/L	P332259	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.8		mg N/L	P332605	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P332319	
	SM 5310 B-00	Organic Carbon	0.99	I	mg C/L	P332406	
1931053	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.042		mg P/L	P332142	
1931060	EPA 200.7 Rev. 4.4	Calcium	45.7		mg/L	P332179	
		Iron	50	I	ug/L	P332179	
		Magnesium	7.56		mg/L	P332179	
		Potassium	1.0	I	mg/L	P332179	
		Sodium	6.1		mg/L	P332179	
		Zinc	5.0	U	ug/L	P332179	
	EPA 200.8 Rev. 5.4	Arsenic	1.21		ug/L	P332179	
		Cadmium	0.041	I	ug/L	P332179	
		Chromium	0.76	I	ug/L	P332179	
		Copper	0.20	U	ug/L	P332179	
		Lead	0.12	I	ug/L	P332179	
		Nickel	0.45	I	ug/L	P332179	
		Silver	0.010	U	ug/L	P332179	

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

Sample Location: Blue Springs (Lake County) @ Weir **Collection Date/Time: 09/21/2017 10:57**

Field ID: G1CE0024 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931054	EPA 180.1 Rev. 2.0	Turbidity	0.25		NTU	P332116	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P332302	
		Sulfate	9.9		mg SO4/L	P332303	
	SM 2120 B	Color (true)	2.5	U	PCU	P332106	
	SM 2320 B-97	Total Alkalinity	106	A	mg CaCO3/L	P332210	
	SM 2540 C-97	TDS	146		mg/L	P332591	
	SM 2540 D-97	TSS	2	U	mg/L	P332585	
	SM 4500 F-C-97	Fluoride	0.090	IJ	mg F/L	P332211	RPD
1931055	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P332338	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.12	I	mg N/L	P332259	

Field ID: G1CE0024 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1931055	EPA 353.2 Rev. 2.0	NO2NO3-N	2.7		mg N/L	P332605	
	EPA 365.1 Rev. 2.0	Total-P	0.040		mg P/L	P332319	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P332406	
1931056	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.036		mg P/L	P332142	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: Refer to the narrative for an explanation of QC Codes.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P332116

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P332179

Component	Result	Code	Units
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: P332179

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332302

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332303

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332337

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332338

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332259

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332605

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332319

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332142

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

Reference Method: SM 2120 B
Batch ID: P332106

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P332210

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

Reference Method: SM 2540 C-97
Batch ID: P332591

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P332585

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P332211

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P332406

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: P332179

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P332179

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	101		P	85 - 115
Copper	97.0		P	85 - 115
Lead	98.2		P	85 - 115
Nickel	98.9		P	85 - 115
Silver	99.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332302

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332303

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332337

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	107		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332338

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332259

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.3		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332605

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332319

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332142

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

Reference Method: SM 2320 B-97
Batch ID: P332210

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P332211

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.6		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P332406

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P332179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1930976	Calcium	107		P	80 - 120
1930976	Iron	105		P	80 - 120
1930976	Magnesium	106		P	80 - 120
1930976	Potassium	104		P	80 - 120
1930976	Sodium	103		P	80 - 120
1930976	Zinc	103		P	80 - 120
1931060	Calcium	95.3		P	80 - 120
1931060	Iron	104	104	P/P	80 - 120
1931060	Magnesium	97.0		P	80 - 120
1931060	Potassium	99.5	99.1	P/P	80 - 120
1931060	Sodium	97.8		P	80 - 120
1931060	Zinc	94.8	95.3	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P332179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1930976	Arsenic	101		P	80 - 120
1930976	Cadmium	104		P	80 - 120
1930976	Chromium	98.4		P	80 - 120
1930976	Copper	96.0		P	80 - 120
1930976	Lead	98.9		P	80 - 120
1930976	Nickel	97.0		P	80 - 120
1930976	Silver	98.2		P	80 - 120
1931060	Arsenic	102	101	P/P	80 - 120
1931060	Cadmium	106	103	P/P	80 - 120
1931060	Chromium	99.0	98.2	P/P	80 - 120
1931060	Copper	94.1	93.1	P/P	80 - 120
1931060	Lead	99.5	98.6	P/P	80 - 120
1931060	Nickel	97.4	94.7	P/P	80 - 120
1931060	Silver	99.4	99.4	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332302

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1930998	Chloride	95.6		P	90 - 110
1930999	Chloride	95.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1930998	Sulfate	108		P	90 - 110
1930999	Sulfate	105		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1930963	Ammonia-N	104	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931055	Ammonia-N	98.5	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332259

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931046	Kjeldahl Nitrogen	104	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332605

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931000	NO2NO3-N	106	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931052	Total-P	97.4	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332142

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931047	O-Phosphate-P	96.2	96.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P332211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1931054	Fluoride	95.8	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P332406

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1930963	Organic Carbon	94.3	95.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P332116

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1930997	Turbidity	0.0	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P332179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931060	Calcium	1.62	Spike	P	0 - 20
1931060	Iron	0.369	Spike	P	0 - 20
1931060	Magnesium	0.166	Spike	P	0 - 20
1931060	Potassium	0.372	Spike	P	0 - 20
1931060	Sodium	1.85	Spike	P	0 - 20
1931060	Zinc	0.518	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P332179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931060	Arsenic	0.710	Spike	P	0 - 20
1931060	Cadmium	2.58	Spike	P	0 - 20
1931060	Chromium	0.776	Spike	P	0 - 20
1931060	Copper	1.12	Spike	P	0 - 20
1931060	Lead	0.898	Spike	P	0 - 20
1931060	Nickel	2.78	Spike	P	0 - 20
1931060	Silver	0.0193	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332302

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1930998	Chloride	1.93	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P332303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1930998	Sulfate	3.49	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1930963	Ammonia-N	2.94	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P332338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931055	Ammonia-N	2.81	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P332259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931046	Kjeldahl Nitrogen	3.24	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P332605

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931000	NO2NO3-N	0.952	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P332319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931052	Total-P	1.88	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P332142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931047	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P332106

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1930998	Color (true)	1.23	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P332210

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931054	Total Alkalinity	0.0265	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P332591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1930993	TDS	7.27	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P332211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1931054	Fluoride	4.56	Spike	F	0 - 3.0

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P332406

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1930963	Organic Carbon	0.994	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: SM 2120 B
Run ID: A79108
Included Lab Sample IDs: 1931051, 1931054

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A79112
Included Lab Sample IDs: 1931051, 1931054

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A79121
Included Lab Sample IDs: 1931053, 1931056

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A79144
Included Lab Sample IDs: 1931051, 1931054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.2	101	P/P	90 - 110
Total Alkalinity	98.4	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A79144
Included Lab Sample IDs: 1931051, 1931054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	99.0	P/P	90 - 110
Fluoride	99.5	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A79147
Included Lab Sample IDs: 1931051, 1931054

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A79147
Included Lab Sample IDs: 1931051, 1931054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	106	101	P/P	90 - 110
Sulfate	106	99.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A79163
Included Lab Sample IDs: 1931060

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	98.5	101	P/P	90 - 110
Sodium	98.2	99.3	P/P	90 - 110
Zinc	98.7	97.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A79196
Included Lab Sample IDs: 1931052, 1931055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	105	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A79198
Included Lab Sample IDs: 1931060

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	104	P/P	90 - 110
Cadmium	105	104	P/P	90 - 110
Chromium	103	104	P/P	90 - 110
Copper	101	101	P/P	90 - 110
Lead	101	101	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Silver	100	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A79208
Included Lab Sample IDs: 1931052

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A79212
Included Lab Sample IDs: 1931055

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A79215
Included Lab Sample IDs: 1931052, 1931055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.8	93.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A79232
Included Lab Sample IDs: 1931052, 1931055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.0	96.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A79298
Included Lab Sample IDs: 1931052, 1931055

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	105	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						0.0	
EPA 200.7 Rev. 4.4	Calcium	105	107	95.3				1.62
	Iron	108	105	104	104			0.369
	Magnesium	105	106	97.0				0.166
	Potassium	102	104	99.5	99.1			0.372
	Sodium	102	103	97.8				1.85
	Zinc	102	103	94.8	95.3			0.518
EPA 200.8 Rev. 5.4	Arsenic	101	101	102	101			0.710
	Cadmium	103	104	106	103			2.58
	Chromium	101	98.4	99.0	98.2			0.776
	Copper	97.0	96.0	94.1	93.1			1.12
	Lead	98.2	98.9	99.5	98.6			0.898
	Nickel	98.9	97.0	97.4	94.7			2.78
	Silver	99.9	98.2	99.4	99.4			0.0193
EPA 300.0 Rev. 2.1	Chloride	98.8	95.6	95.8			1.93	
	Sulfate	106	108	105			3.49	
EPA 350.1 Rev. 2.0	Ammonia-N	107	104	101				2.94
	Ammonia-N	106	98.5	102				2.81
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.3	104	109				3.24
EPA 353.2 Rev. 2.0	NO2NO3-N	104	106	104				0.952
EPA 365.1 Rev. 2.0	Total-P	98.0	97.4	99.7				1.88
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	96.2	96.2				0.0
SM 2120 B	Color (true)						1.23	
SM 2320 B-97	Total Alkalinity	101					0.0265	
SM 2540 C-97	TDS						7.27	

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
SM 4500 F-C-97	Fluoride	96.6	95.8	101			4.56
SM 5310 B-00	Organic Carbon	94.4	94.3	95.4			0.994

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1931051, 1931054
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1931060
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1931060
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1931051, 1931054
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1931051, 1931054
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1931052, 1931055
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1931052, 1931055
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1931052, 1931055
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1931052, 1931055
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1931053, 1931056
SM 2120 B / E31780	True Color measured at 450 nm	1931051, 1931054
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1931051, 1931054
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1931051, 1931054
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1931051, 1931054
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1931051, 1931054
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1931052, 1931055

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	09/22/2017			09/22/2017 17:40	Tanya Welborn	1931051, 1931054
EPA 200.7 Rev. 4.4	09/22/2017	09/25/2017	Elliott D. Healy	09/26/2017	Betina Topolski	1931060
EPA 200.8 Rev. 5.4	09/22/2017	09/25/2017	Elliott D. Healy	09/27/2017	Nadine Brooks	1931060
EPA 300.0 Rev. 2.1	09/22/2017			09/26/2017	Julia Storbeck	1931051, 1931054
EPA 350.1 Rev. 2.0	09/22/2017			09/26/2017	Sofia Elnemr	1931052, 1931055
EPA 351.2 Rev. 2.0	09/22/2017	09/28/2017	Sofia Elnemr	09/29/2017	Joseph Suarez	1931052, 1931055
EPA 353.2 Rev. 2.0	09/22/2017			10/03/2017	Beverly Y. Sanders	1931052, 1931055
EPA 365.1 Rev. 2.0	09/22/2017	09/27/2017	Sima Feizi	09/28/2017	Lipi Saha	1931052, 1931055
EPA 365.1 Rev. 2.0 dissolved	09/22/2017			09/22/2017 15:42	Megan Treadwell	1931053, 1931056
SM 2120 B	09/22/2017			09/22/2017 15:46	Julia Storbeck	1931051
	09/22/2017			09/22/2017 15:47	Julia Storbeck	1931054
SM 2320 B-97	09/22/2017			09/25/2017	Dale L. Simmons	1931051, 1931054
SM 2540 C-97	09/22/2017			09/27/2017	Yijie Li	1931051, 1931054
SM 2540 D-97	09/22/2017			09/27/2017	Yijie Li	1931051, 1931054
SM 4500 F-C-97	09/22/2017			09/25/2017	Dale L. Simmons	1931051, 1931054
SM 5310 B-00	09/22/2017			09/27/2017	Ping Hua	1931052, 1931055