

Chemical Analysis Report

NE-DIST-2018-05-11-02

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

Event Description: **Olustee SCI, Cannon creek**
Request ID: **RQ-2018-04-23-10**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
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8800 Baymeadows Way West
Suite 100
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Certified by: Colin Wright, Program Administrator

Date Certified: 15-JUN-2018 11:12

A handwritten signature in black ink, appearing to read "Colin Wright", is shown on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited 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: Olustee Creek @ 238

Collection Date/Time: 05/10/2018 08:55

Field ID: 21020009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992410	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P345148	
	EPA 300.0 Rev. 2.1	Chloride	10		mg Cl/L	P345433	
		Sulfate	0.40	I	mg SO4/L	P345435	
	SM 2120 B	Color (true)	480		PCU	P345138	
	SM 2320 B-97	Total Alkalinity	5.7		mg CaCO3/L	P345483	
	SM 2540 C-97	TDS	114		mg/L	P345721	
	SM 2540 D-97	TSS	3	I	mg/L	P345713	
	SM 4500 F-C-97	Fluoride	0.086	I	mg F/L	P345486	
1992411	EPA 350.1 Rev. 2.0	Ammonia-N	0.075		mg N/L	P345385	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P345535	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.086		mg N/L	P345409	
	EPA 365.1 Rev. 2.0	Total-P	0.23		mg P/L	P345443	
	SM 5310 B-00	Organic Carbon	42		mg C/L	P345545	
1992412	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.19		mg P/L	P345152	
1992429	EPA 200.7 Rev. 4.4	Calcium	6.06		mg/L	P345280	
		Iron	880		ug/L	P345280	
		Magnesium	2.56		mg/L	P345280	
		Potassium	0.30	U	mg/L	P345280	
		Sodium	5.2		mg/L	P345280	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P345280	
		Arsenic	0.44		ug/L	P345280	
		Cadmium	0.022	I	ug/L	P345280	
		Chromium	1.3	I	ug/L	P345280	
		Copper	0.35	I	ug/L	P345280	
		Lead	0.39		ug/L	P345280	
		Nickel	0.73	I	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	

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: P345148

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P345280

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Component	Result	Code	Units
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

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: P345433

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345435

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345385

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345535

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345409

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345443

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345152

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

Reference Method: SM 2120 B
Batch ID: P345138

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P345483

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

Reference Method: SM 2540 C-97
Batch ID: P345721

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345713

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P345486

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P345545

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: P345280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	99.8		P	85 - 115
Iron	104		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	98.3		P	85 - 115
Sodium	97.5		P	85 - 115
Zinc	99.5		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P345280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	108		P	85 - 115
Copper	103		P	85 - 115
Lead	105		P	85 - 115
Nickel	102		P	85 - 115
Silver	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P345433

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P345435

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P345385

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: P345535

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

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P345409

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

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P345443

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P345152

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.3		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P345483

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P345486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.6		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345545

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992363	Calcium	100		P	80 - 120
1992363	Iron	103	103	P/P	80 - 120
1992363	Magnesium	103	104	P/P	80 - 120
1992363	Potassium	96.7	96.4	P/P	80 - 120
1992363	Sodium	99.1		P	80 - 120
1992363	Zinc	102	101	P/P	80 - 120
1992415	Calcium	101		P	80 - 120
1992415	Iron	104		P	80 - 120
1992415	Magnesium	106		P	80 - 120
1992415	Potassium	96.8		P	80 - 120
1992415	Sodium	92.2		P	80 - 120
1992415	Zinc	99.0		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992363	Arsenic	101	104	P/P	80 - 120
1992363	Cadmium	102	105	P/P	80 - 120
1992363	Chromium	107	111	P/P	80 - 120
1992363	Copper	99.8	105	P/P	80 - 120
1992363	Lead	104	107	P/P	80 - 120
1992363	Nickel	99.4	102	P/P	80 - 120
1992363	Silver	98.2	103	P/P	80 - 120
1992415	Arsenic	105		P	80 - 120
1992415	Cadmium	110		P	80 - 120
1992415	Chromium	101		P	80 - 120
1992415	Copper	105		P	80 - 120
1992415	Lead	106		P	80 - 120
1992415	Nickel	100		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992415	Silver	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345433

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992246	Chloride	96.9		P	90 - 110
1992309	Chloride	98.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992246	Sulfate	93.8		P	90 - 110
1992309	Sulfate	96.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345385

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992310	Ammonia-N	97.5	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345535

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992301	Kjeldahl Nitrogen	100	90.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345409

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992301	NO2NO3-N	99.9	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345443

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992598	Total-P	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345152

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992307	O-Phosphate-P	101	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P345486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992225	Fluoride	94.9	93.8	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P345545

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992342	Organic Carbon	93.3	94.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P345148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992295	Turbidity	3.43	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992363	Calcium	0.368	Spike	P	0 - 20
1992363	Iron	0.549	Spike	P	0 - 20
1992363	Magnesium	0.806	Spike	P	0 - 20
1992363	Potassium	0.183	Spike	P	0 - 20
1992363	Sodium	0.0954	Spike	P	0 - 20
1992363	Zinc	0.195	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992363	Arsenic	3.25	Spike	P	0 - 20
1992363	Cadmium	2.01	Spike	P	0 - 20
1992363	Chromium	4.06	Spike	P	0 - 20
1992363	Copper	5.14	Spike	P	0 - 20
1992363	Lead	3.04	Spike	P	0 - 20
1992363	Nickel	3.03	Spike	P	0 - 20
1992363	Silver	4.33	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992246	Chloride	0.405	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992246	Sulfate	2.03	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992310	Ammonia-N	1.48	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345535

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992301	Kjeldahl Nitrogen	7.45	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345409

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992301	NO2NO3-N	0.380	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992598	Total-P	1.27	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992307	O-Phosphate-P	0.298	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P345138

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992297	Color (true)	4.75	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P345483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992225	Total Alkalinity	0.607	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P345721

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992341	TDS	9.42	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P345486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992225	Fluoride	0.943	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P345545

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992342	Organic Carbon	0.675	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: A83828
Included Lab Sample IDs: 1992410

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.3	99.8	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83829
Included Lab Sample IDs: 1992410

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A83830
Included Lab Sample IDs: 1992412

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83885
Included Lab Sample IDs: 1992410

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Sulfate	99.4	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83925
Included Lab Sample IDs: 1992411

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A83934

Included Lab Sample IDs: 1992411

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A83969

Included Lab Sample IDs: 1992410

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A83969

Included Lab Sample IDs: 1992410

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A83986

Included Lab Sample IDs: 1992429

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	98.7	P/P	90 - 110
Iron	100	100	P/P	90 - 110
Magnesium	100	100	P/P	90 - 110
Potassium	97.0	97.1	P/P	90 - 110
Sodium	98.4	96.4	P/P	90 - 110
Zinc	101	98.3	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A83989

Included Lab Sample IDs: 1992411

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.0	95.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83991

Included Lab Sample IDs: 1992429

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.5	98.9	P/P	90 - 110
Cadmium	102	100	P/P	90 - 110
Chromium	104	105	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Nickel	96.6	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A84044

Included Lab Sample IDs: 1992411

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A84044

Included Lab Sample IDs: 1992411

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.8	94.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A84065

Included Lab Sample IDs: 1992411

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A84101

Included Lab Sample IDs: 1992429

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	104	97.2	P/P	90 - 110
Silver	99.4	95.8	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			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						3.43	
EPA 200.7 Rev. 4.4	Calcium	99.8	100	101				0.368
	Iron	104	103	103	104			0.549
	Magnesium	106	103	104	106			0.806
	Potassium	98.3	96.7	96.4	96.8			0.183
	Sodium	97.5	99.1	92.2				0.0954
	Zinc	99.5	102	101	99.0			0.195
EPA 200.8 Rev. 5.4	Arsenic	104	101	104	105			3.25
	Cadmium	102	102	105	110			2.01
	Chromium	108	107	111	101			4.06
	Copper	103	99.8	105	105			5.14
	Lead	105	104	107	106			3.04
	Nickel	102	99.4	102	100			3.03
	Silver	102	98.2	103	107			4.33
EPA 300.0 Rev. 2.1	Chloride	98.5	96.9	98.5			0.405	
	Sulfate	95.7	93.8	96.8			2.03	
EPA 350.1 Rev. 2.0	Ammonia-N	101	97.5	99.3				1.48
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	100	90.7				7.45
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.9	100				0.380
EPA 365.1 Rev. 2.0	Total-P	102	101	102				1.27
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	101	100				0.298
SM 2120 B	Color (true)						4.75	
SM 2320 B-97	Total Alkalinity	102					0.607	
SM 2540 C-97	TDS						9.42	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
			LCS			
SM 4500 F-C-97	Fluoride	95.6	94.9	93.8		0.943
SM 5310 B-00	Organic Carbon	95.4	93.3	94.1		0.675

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1992410
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1992429
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1992429
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1992410
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1992410
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1992411
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1992411
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1992411
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1992411
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1992412
SM 2120 B / E31780	True Color measured at 450 nm	1992410
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1992410
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1992410
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	1992410
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1992410
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1992411

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	05/11/2018			05/11/2018 14:35	Tanya Welborn	1992410
EPA 200.7 Rev. 4.4	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 22:05	Betina Topolski	1992429
EPA 200.8 Rev. 5.4	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 21:11	Robert K Palmer	1992429
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 12:51	Robert K Palmer	1992429
EPA 300.0 Rev. 2.1	05/11/2018			05/15/2018 18:41	Lipi Saha	1992410
EPA 350.1 Rev. 2.0	05/11/2018			05/15/2018 11:27	Ping Hua	1992411
EPA 351.2 Rev. 2.0	05/11/2018	05/17/2018 15:45	Adrian Shelby	05/18/2018 20:47	Joseph Suarez	1992411
EPA 353.2 Rev. 2.0	05/11/2018			05/16/2018 12:28	Lauren Bottorf	1992411
EPA 365.1 Rev. 2.0	05/11/2018	05/16/2018 08:57	Sima Feizi	05/22/2018 10:27	Beverly Y. Sanders	1992411
EPA 365.1 Rev. 2.0 dissolved	05/11/2018			05/11/2018 14:59	Julia Storbeck	1992412
SM 2120 B	05/11/2018			05/11/2018 15:07	Tanya Welborn	1992410
SM 2320 B-97	05/11/2018			05/16/2018 05:55	Dale L. Simmons	1992410
SM 2540 C-97	05/11/2018			05/16/2018 15:26	Yijie Li	1992410
SM 2540 D-97	05/11/2018			05/16/2018 15:26	Yijie Li	1992410
SM 4500 F-C-97	05/11/2018			05/16/2018 05:55	Dale L. Simmons	1992410
SM 5310 B-00	05/11/2018			05/17/2018 04:38	Megan Treadwell	1992411