

Chemical Analysis Report

SO-DIST-2018-08-14-01

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

Event Description: **Telegraph**
Request ID: **RQ-2018-07-30-10**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Nicole Reistad

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 29-AUG-2018 15:31



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: Telegraph Swamp South

Collection Date/Time: 08/13/2018 10:10

Field ID: G3SD0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2016797	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P350098	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P350216	
		Sulfate	2.1		mg SO4/L	P350218	
		Color (true)	360		PCU	P350087	
	SM 2320 B-97	Total Alkalinity	40		mg CaCO3/L	P350184	
	SM 2540 C-97	TDS	109		mg/L	P350515	
	SM 2540 D-97	TSS	3	I	mg/L	P350398	
	SM 4500 F-C-97	Fluoride	0.075	I	mg F/L	P350187	
2016798	EPA 350.1 Rev. 2.0	Ammonia-N	0.041		mg N/L	P350441	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P350595	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.033		mg N/L	P350362	
	EPA 365.1 Rev. 2.0	Total-P	0.083		mg P/L	P350434	
	SM 5310 B-00	Organic Carbon	27		mg C/L	P350386	
2016799	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.048		mg P/L	P350088	
2016802	EPA 200.7 Rev. 4.4	Calcium	18.7		mg/L	P350165	
		Iron	990		ug/L	P350165	
		Magnesium	2.85		mg/L	P350165	
		Potassium	0.78	I	mg/L	P350165	
		Sodium	12.1		mg/L	P350165	
		Zinc	5.0	U	ug/L	P350165	
	EPA 200.8 Rev. 5.4	Arsenic	0.74		ug/L	P350165	
		Cadmium	0.020	U	ug/L	P350165	
		Chromium	0.56	I	ug/L	P350165	
		Copper	0.76	I	ug/L	P350165	
		Lead	0.17	I	ug/L	P350165	
		Nickel	0.33	I	ug/L	P350165	
		Silver	0.010	U	ug/L	P350165	

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: P350098

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350165

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: P350165

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: P350216

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350218

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350441

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350595

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350362

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350434

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350088

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

Reference Method: SM 2120 B
Batch ID: P350087

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P350184

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

Reference Method: SM 2540 C-97
Batch ID: P350515

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P350398

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P350187

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P350386

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: P350165

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	102		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	97.5		P	85 - 115
Sodium	99.6		P	85 - 115
Zinc	95.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350165

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	99.7		P	85 - 115
Chromium	98.1		P	85 - 115
Copper	97.7		P	85 - 115
Lead	98.2		P	85 - 115
Nickel	101		P	85 - 115
Silver	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350216

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350218

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350441

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350595

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350362

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350434

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350088

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.8		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P350087

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.8		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P350184

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P350187

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350386

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016847	Calcium	102		P	80 - 120
2016847	Iron	100	104	P/P	80 - 120
2016847	Magnesium	101	106	P/P	80 - 120
2016847	Potassium	96.2	99.8	P/P	80 - 120
2016847	Sodium	95.8		P	80 - 120
2016847	Zinc	98.4	97.9	P/P	80 - 120
2017023	Calcium	105		P	80 - 120
2017023	Iron	104		P	80 - 120
2017023	Magnesium	104		P	80 - 120
2017023	Potassium	101		P	80 - 120
2017023	Sodium	97.1		P	80 - 120
2017023	Zinc	98.6		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016847	Arsenic	99.7	101	P/P	80 - 120
2016847	Cadmium	99.9	100	P/P	80 - 120
2016847	Chromium	95.1	95.2	P/P	80 - 120
2016847	Copper	96.2	97.1	P/P	80 - 120
2016847	Lead	96.3	98.0	P/P	80 - 120
2016847	Nickel	96.7	97.0	P/P	80 - 120
2016847	Silver	98.0	98.9	P/P	80 - 120
2017023	Arsenic	102		P	80 - 120
2017023	Cadmium	101		P	80 - 120
2017023	Chromium	97.5		P	80 - 120
2017023	Copper	93.1		P	80 - 120
2017023	Lead	98.1		P	80 - 120
2017023	Nickel	96.1		P	80 - 120
2017023	Silver	99.5		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350216

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016726	Chloride	103		P	90 - 110
2016782	Chloride	94.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350218

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016726	Sulfate	99.9		P	90 - 110
2016782	Sulfate	91.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350441

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016732	Ammonia-N	98.6	97.8	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016732	Kjeldahl Nitrogen	101	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350362

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016783	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016828	Total-P	95.9	95.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016764	O-Phosphate-P	95.9	97.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P350187

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016665	Fluoride	97.2	96.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350386

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2016729	Organic Carbon	98.0	94.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P350098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016862	Turbidity	1.12	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016847	Calcium	0.796	Spike	P	0 - 20
2016847	Iron	3.50	Spike	P	0 - 20
2016847	Magnesium	3.19	Spike	P	0 - 20
2016847	Potassium	2.51	Spike	P	0 - 20
2016847	Sodium	0.419	Spike	P	0 - 20
2016847	Zinc	0.517	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016847	Arsenic	0.801	Spike	P	0 - 20
2016847	Cadmium	0.406	Spike	P	0 - 20
2016847	Chromium	0.0612	Spike	P	0 - 20
2016847	Copper	0.965	Spike	P	0 - 20
2016847	Lead	1.70	Spike	P	0 - 20
2016847	Nickel	0.384	Spike	P	0 - 20
2016847	Silver	0.963	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350216

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016726	Chloride	2.35	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350218

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016726	Sulfate	2.35	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350441

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016732	Ammonia-N	0.763	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016732	Kjeldahl Nitrogen	1.45	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016783	NO2NO3-N	0.345	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016828	Total-P	0.235	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016764	O-Phosphate-P	1.45	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P350087

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016852	Color (true)	1.26	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P350184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016665	Total Alkalinity	0.0595	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P350515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016760	TDS	5.03	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P350187

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016665	Fluoride	0.479	Spike	P	0 - 3.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P350386

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2016729	Organic Carbon	2.87	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 300.0 Rev. 2.1

Run ID: A85845

Included Lab Sample IDs: 2016797

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	95.6	96.2	P/P	90 - 110
Sulfate	94.3	94.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A85864

Included Lab Sample IDs: 2016799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	98.9	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A85865

Included Lab Sample IDs: 2016797

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.4	99.5	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A85866

Included Lab Sample IDs: 2016797

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

Reference Method: SM 2320 B-97

Run ID: A85905

Included Lab Sample IDs: 2016797

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A85905

Included Lab Sample IDs: 2016797

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A85942

Included Lab Sample IDs: 2016802

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	103	P/P	95 - 105
Iron	100	100	P/P	95 - 105
Magnesium	101	101	P/P	95 - 105
Potassium	99.0	99.1	P/P	95 - 105
Sodium	100	98.8	P/P	95 - 105
Zinc	99.9	97.7	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A85961

Included Lab Sample IDs: 2016802

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	94.4	95.9	P/P	90 - 110
Cadmium	94.1	93.6	P/P	90 - 110
Chromium	94.0	93.8	P/P	90 - 110
Copper	93.6	94.7	P/P	90 - 110
Lead	99.1	99.1	P/P	90 - 110
Nickel	93.3	94.1	P/P	90 - 110
Silver	97.0	96.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A85973

Included Lab Sample IDs: 2016798

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

Reference Method: SM 5310 B-00

Run ID: A85977

Included Lab Sample IDs: 2016798

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.4	95.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86004

Included Lab Sample IDs: 2016798

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86021

Included Lab Sample IDs: 2016798

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86079

Included Lab Sample IDs: 2016798

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.8	99.2	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						1.12	
EPA 200.7 Rev. 4.4	Calcium	103	102	105				0.796
	Iron	102	100	104	104			3.50
	Magnesium	105	101	106	104			3.19
	Potassium	97.5	96.2	99.8	101			2.51
	Sodium	99.6	95.8	97.1				0.419
	Zinc	95.9	98.4	97.9	98.6			0.517
EPA 200.8 Rev. 5.4	Arsenic	100	99.7	101	102			0.801
	Cadmium	99.7	99.9	100	101			0.406
	Chromium	98.1	95.1	95.2	97.5			0.0612
	Copper	97.7	96.2	97.1	93.1			0.965
	Lead	98.2	96.3	98.0	98.1			1.70
	Nickel	101	96.7	97.0	96.1			0.384
	Silver	100	98.0	98.9	99.5			0.963
EPA 300.0 Rev. 2.1	Chloride	97.9	103	94.7			2.35	
	Sulfate	98.2	99.9	91.2			2.35	
EPA 350.1 Rev. 2.0	Ammonia-N	98.5	98.6	97.8				0.763
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	101	103				1.45
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	101	101				0.345
EPA 365.1 Rev. 2.0	Total-P	98.6	95.9	95.6				0.235
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.8	95.9	97.3				1.45
SM 2120 B	Color (true)	96.8					1.26	
SM 2320 B-97	Total Alkalinity	103					0.0595	
SM 2540 C-97	TDS						5.03	
SM 4500 F-C-97	Fluoride	96.1	97.2	96.7				0.479
SM 5310 B-00	Organic Carbon	97.3	98.0	94.7				2.87

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2016797
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2016802
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2016802
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2016797
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2016797
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2016798
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2016798
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2016798
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2016798
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2016799
SM 2120 B / E31780	True Color measured at 450 nm	2016797
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2016797
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2016797
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2016797
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2016797

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2016798

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	08/14/2018			08/14/2018 15:06	William L. Brown IV	2016797
EPA 200.7 Rev. 4.4	08/14/2018	08/15/2018 16:20	Elliott D. Healy	08/16/2018 14:32	Betina Topolski	2016802
EPA 200.8 Rev. 5.4	08/14/2018	08/15/2018 16:20	Elliott D. Healy	08/16/2018 18:18	Allison Taylor	2016802
EPA 300.0 Rev. 2.1	08/14/2018			08/16/2018 00:45	Lipi Saha	2016797
EPA 350.1 Rev. 2.0	08/14/2018			08/17/2018 11:45	Ping Hua	2016798
EPA 351.2 Rev. 2.0	08/14/2018	08/22/2018 10:30	Adrian Shelby	08/23/2018 10:01	Joseph Suarez	2016798
EPA 353.2 Rev. 2.0	08/14/2018			08/17/2018 12:51	Lauren Bottorf	2016798
EPA 365.1 Rev. 2.0	08/14/2018	08/20/2018 12:57	Sima Feizi	08/21/2018 08:39	Beverly Y. Sanders	2016798
EPA 365.1 Rev. 2.0 dissolved	08/14/2018			08/14/2018 16:02	Julia Storbeck	2016799
SM 2120 B	08/14/2018			08/14/2018 16:18	Tanya Welborn	2016797
SM 2320 B-97	08/14/2018			08/15/2018 21:49	Dale L. Simmons	2016797
SM 2540 C-97	08/14/2018			08/15/2018 15:06	Yijie Li	2016797
SM 2540 D-97	08/14/2018			08/15/2018 15:06	Yijie Li	2016797
SM 4500 F-C-97	08/14/2018			08/15/2018 21:49	Dale L. Simmons	2016797
SM 5310 B-00	08/14/2018			08/17/2018 09:09	Megan Treadwell	2016798