

Chemical Analysis Report

SO-DIST-2018-12-11-03

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

Event Description: **Telegraph, Pollywog, OK Branch**

Request ID: **RQ-2018-10-29-76**

Customer: **SO-DIST**

Project ID: **SMP**

Send Reports to:

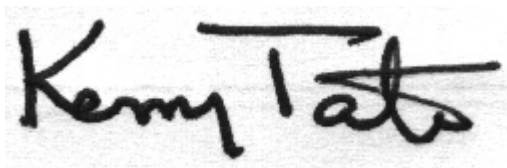
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 03-JAN-2019 13:23

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Pollywog Creek @ SR 78

Collection Date/Time: 12/10/2018 09:15

Field ID: G3SD0098

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047965	EPA 180.1 Rev. 2.0	Turbidity	6.2		NTU	P355977	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P356285	
		Sulfate	9.0		mg SO4/L	P356286	
	SM 2120 B	Color (true)	63		PCU	P355963	
	SM 2320 B-97	Total Alkalinity	44		mg CaCO3/L	P356129	
	SM 2540 C-97	TDS	139		mg/L	P356407	
	SM 2540 D-97	TSS	3	I	mg/L	P356479	
	SM 4500 F-C-97	Fluoride	0.30		mg F/L	P356132	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.052		mg N/L	P356258	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P356094	
2047966	EPA 353.2 Rev. 2.0	NO2NO3-N	0.059		mg N/L	P356137	
	EPA 365.1 Rev. 2.0	Total-P	1.2		mg P/L	P356178	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P356071	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.93		mg P/L	P356028	
	dissolved						
2047967	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.93		mg P/L	P356028	

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: Bee Branch @LoblollyBay

Collection Date/Time: 12/10/2018 09:30

Field ID: G3SD0085

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047968	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P355978	
	EPA 300.0 Rev. 2.1	Chloride	62		mg Cl/L	P356285	
		Sulfate	32		mg SO4/L	P356286	
	SM 2120 B	Color (true)	100		PCU	P355963	
	SM 2320 B-97	Total Alkalinity	29		mg CaCO3/L	P356129	
	SM 2540 C-97	TDS	237		mg/L	P356407	
	SM 2540 D-97	TSS	8	I	mg/L	P356479	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P356132	
2047970	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P356258	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.94		mg N/L	P356094	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P356137	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P356178	
	SM 5310 B-00	Organic Carbon	20		mg C/L	P356071	
2047972	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.063		mg P/L	P356028	

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: Telegraph Swamp South

Collection Date/Time: 12/10/2018 12:55

Field ID: G3SD0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2047969	EPA 180.1 Rev. 2.0	Turbidity	14	A	NTU	P355978	
	EPA 300.0 Rev. 2.1	Chloride	91		mg Cl/L	P356285	
		Sulfate	24		mg SO4/L	P356286	
		Color (true)	70		PCU	P355963	
	SM 2320 B-97	Total Alkalinity	93		mg CaCO3/L	P356129	
	SM 2540 C-97	TDS	309		mg/L	P356407	
	SM 2540 D-97	TSS	19		mg/L	P356479	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P356132	
2047971	EPA 350.1 Rev. 2.0	Ammonia-N	1.4		mg N/L	P356258	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.3		mg N/L	P356094	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.22		mg N/L	P356137	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P356178	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P356071	
2047973	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.029		mg P/L	P356028	
2047979	EPA 200.7 Rev. 4.4	Calcium	43.2		mg/L	P356049	
		Iron	1.05E+03		ug/L	P356049	
		Magnesium	10.4		mg/L	P356049	
		Potassium	4.3		mg/L	P356049	
		Sodium	46.6		mg/L	P356049	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P356049	
		Arsenic	0.90		ug/L	P356049	
		Cadmium	0.020	U	ug/L	P356049	
		Chromium	1.5	I	ug/L	P356049	
		Copper	0.71	I	ug/L	P356049	
		Lead	0.38		ug/L	P356049	
		Nickel	0.41	I	ug/L	P356049	
		Silver	0.010	U	ug/L	P356049	

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: P355977

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355978

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356049

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: P356049

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: P356285

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356286

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356258

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356094

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356137

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356178

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356028

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

Reference Method: SM 2120 B
Batch ID: P355963

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P356129

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

Reference Method: SM 2540 C-97
Batch ID: P356407

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356479

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P356132

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P356071

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: P356049

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	104		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	109		P	85 - 115
Sodium	112		P	85 - 115
Zinc	96.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356049

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356285

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356286

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356258

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356094

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356137

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: P356178

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356028

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.6		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P355963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	103		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P356129

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.9		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P356132

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.5		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356071

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	105		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356049

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047670	Calcium	105		P	80 - 120
2047670	Iron	105		P	80 - 120
2047670	Magnesium	107		P	80 - 120
2047670	Potassium	110		P	80 - 120
2047670	Sodium	107		P	80 - 120
2047670	Zinc	97.7		P	80 - 120
2047793	Calcium	100		P	80 - 120
2047793	Iron	106	106	P/P	80 - 120
2047793	Magnesium	109	109	P/P	80 - 120
2047793	Potassium	112	113	P/P	80 - 120
2047793	Sodium	114	116	P/P	80 - 120
2047793	Zinc	98.6	96.2	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356049

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047670	Arsenic	104		P	80 - 120
2047670	Cadmium	104		P	80 - 120
2047670	Chromium	102		P	80 - 120
2047670	Copper	103		P	80 - 120
2047670	Lead	102		P	80 - 120
2047670	Nickel	101		P	80 - 120
2047670	Silver	100		P	80 - 120
2047793	Arsenic	107	107	P/P	80 - 120
2047793	Cadmium	106	105	P/P	80 - 120
2047793	Chromium	104	104	P/P	80 - 120
2047793	Copper	105	104	P/P	80 - 120
2047793	Lead	105	105	P/P	80 - 120
2047793	Nickel	104	104	P/P	80 - 120
2047793	Silver	104	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047866	Chloride	96.9		P	90 - 110
2048019	Chloride	95.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356286

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047866	Sulfate	91.8		P	90 - 110
2048019	Sulfate	92.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356258

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047869	Ammonia-N	98.5	98.6	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356094

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2048024	Kjeldahl Nitrogen	99.1	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356137

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047935	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356178

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047935	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356028

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047973	O-Phosphate-P	93.2	95.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P356132

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047934	Fluoride	101	99.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356071

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2047837	Organic Carbon	104	103	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355977

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047859	Turbidity	0.993	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355978

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047969	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P356049

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047793	Calcium	1.38	Spike	P	0 - 20
2047793	Iron	0.628	Spike	P	0 - 20
2047793	Magnesium	0.561	Spike	P	0 - 20
2047793	Potassium	0.613	Spike	P	0 - 20
2047793	Sodium	1.01	Spike	P	0 - 20
2047793	Zinc	2.51	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P356049

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047793	Arsenic	0.380	Spike	P	0 - 20
2047793	Cadmium	0.795	Spike	P	0 - 20
2047793	Chromium	0.255	Spike	P	0 - 20
2047793	Copper	0.637	Spike	P	0 - 20
2047793	Lead	0.387	Spike	P	0 - 20
2047793	Nickel	0.0109	Spike	P	0 - 20
2047793	Silver	0.229	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047866	Chloride	0.373	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356286

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047866	Sulfate	0.684	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356258

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047869	Ammonia-N	0.0763	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356094

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2048024	Kjeldahl Nitrogen	0.361	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047935	NO2NO3-N	1.15	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047935	Total-P	0.522	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356028

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047973	O-Phosphate-P	1.54	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P355963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047934	Color (true)	1.56	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P356129

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047934	Total Alkalinity	0.236	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P356407

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047866	TDS	6.48	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P356132

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047934	Fluoride	0.470	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P356071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2047837	Organic Carbon	0.862	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: A88283

Included Lab Sample IDs: 2047965, 2047968, 2047969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	107	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A88286

Included Lab Sample IDs: 2047965, 2047968, 2047969

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A88299

Included Lab Sample IDs: 2047967, 2047972, 2047973

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	98.6	P/P	90 - 110
O-Phosphate-P	99.9	99.4	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A88317

Included Lab Sample IDs: 2047966, 2047970, 2047971

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A88324

Included Lab Sample IDs: 2047965, 2047968, 2047969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.9	100	P/P	90 - 110
Sulfate	97.2	98.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88336

Included Lab Sample IDs: 2047979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	96.6	101	P/P	90 - 110
Iron	95.9	99.5	P/P	90 - 110
Magnesium	97.4	101	P/P	90 - 110
Potassium	102	105	P/P	90 - 110
Zinc	99.8	99.1	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A88339

Included Lab Sample IDs: 2047965, 2047968, 2047969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	98.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A88339

Included Lab Sample IDs: 2047965, 2047968, 2047969

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A88340

Included Lab Sample IDs: 2047966, 2047970, 2047971

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A88358

Included Lab Sample IDs: 2047966, 2047970, 2047971

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88367

Included Lab Sample IDs: 2047979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sodium	97.6	98.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88384

Included Lab Sample IDs: 2047979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	103	P/P	90 - 110
Cadmium	102	103	P/P	90 - 110
Chromium	103	103	P/P	90 - 110
Copper	104	104	P/P	90 - 110
Lead	103	104	P/P	90 - 110
Nickel	104	104	P/P	90 - 110
Silver	99.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88389

Included Lab Sample IDs: 2047966, 2047970, 2047971

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88416

Included Lab Sample IDs: 2047966, 2047970, 2047971

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

Quality Assurance Report

Calibration Verification

* 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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					0.993	
	Turbidity					0.0	
EPA 200.7 Rev. 4.4	Calcium	100	105	100			1.38
	Iron	104	105	106	106		0.628
	Magnesium	108	107	109	109		0.561
	Potassium	109	110	112	113		0.613
	Sodium	112	116	107	114		1.01
	Zinc	96.5	97.7	98.6	96.2		2.51
EPA 200.8 Rev. 5.4	Arsenic	105	104	107	107		0.380
	Cadmium	105	104	106	105		0.795
	Chromium	103	102	104	104		0.255
	Copper	103	103	105	104		0.637
	Lead	103	102	105	105		0.387
	Nickel	104	101	104	104		0.0109
	Silver	103	100	104	104		0.229
EPA 300.0 Rev. 2.1	Chloride	96.6	96.9	95.7		0.373	
	Sulfate	94.3	91.8	92.7		0.684	
EPA 350.1 Rev. 2.0	Ammonia-N	96.7	98.5	98.6			0.0763
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	99.1	99.5			0.361
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	100	102			1.15
EPA 365.1 Rev. 2.0	Total-P	99.8	101	101			0.522
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.6	93.2	95.1			1.54
SM 2120 B	Color (true)	103				1.56	
SM 2320 B-97	Total Alkalinity	99.9				0.236	
SM 2540 C-97	TDS					6.48	
SM 4500 F-C-97	Fluoride	99.5	101	99.9			0.470
SM 5310 B-00	Organic Carbon	105	104	103			0.862

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2047965, 2047968, 2047969
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2047979
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2047979
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2047965, 2047968, 2047969
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2047965, 2047968, 2047969
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2047966, 2047970, 2047971
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2047966, 2047970, 2047971
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2047966, 2047970, 2047971
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2047966, 2047970, 2047971
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2047967, 2047972, 2047973
SM 2120 B / E31780	True Color measured at 450 nm	2047965, 2047968, 2047969
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2047965, 2047968, 2047969
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2047965, 2047968, 2047969
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2047965, 2047968, 2047969

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2047965, 2047968, 2047969
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2047966, 2047970, 2047971

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	12/11/2018			12/11/2018 16:59	Megan Treadwell	2047965, 2047968, 2047969
EPA 200.7 Rev. 4.4	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/13/2018 22:28	Betina Topolski	2047979
	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/14/2018 12:31	Betina Topolski	2047979
EPA 200.8 Rev. 5.4	12/11/2018	12/12/2018 16:15	Elliott D. Healy	12/15/2018 12:53	Allison Taylor	2047979
EPA 300.0 Rev. 2.1	12/11/2018			12/17/2018 17:52	Lipi Saha	2047965
	12/11/2018			12/17/2018 18:04	Lipi Saha	2047968
	12/11/2018			12/17/2018 18:17	Lipi Saha	2047969
EPA 350.1 Rev. 2.0	12/11/2018			12/14/2018 13:23	Ping Hua	2047966
	12/11/2018			12/14/2018 13:25	Ping Hua	2047971
	12/11/2018			12/14/2018 13:32	Ping Hua	2047970
EPA 351.2 Rev. 2.0	12/11/2018	12/13/2018 12:30	Adrian Shelby	12/14/2018 11:41	Chelsea Hernandez	2047966
	12/11/2018	12/13/2018 12:30	Adrian Shelby	12/14/2018 11:43	Chelsea Hernandez	2047970
	12/11/2018	12/13/2018 12:30	Adrian Shelby	12/14/2018 11:44	Chelsea Hernandez	2047971
EPA 353.2 Rev. 2.0	12/11/2018			12/12/2018 11:47	Beverly Y. Sanders	2047966
	12/11/2018			12/12/2018 11:48	Beverly Y. Sanders	2047970
	12/11/2018			12/12/2018 11:49	Beverly Y. Sanders	2047971
EPA 365.1 Rev. 2.0	12/11/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 11:56	Beverly Y. Sanders	2047970
	12/11/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 11:57	Beverly Y. Sanders	2047971
	12/11/2018	12/14/2018 12:10	Sima Feizi	12/18/2018 12:46	Beverly Y. Sanders	2047966
EPA 365.1 Rev. 2.0 dissolved	12/11/2018			12/11/2018 16:40	Jhamieka S. Greenwood	2047973
	12/11/2018			12/11/2018 17:16	Jhamieka S. Greenwood	2047972
	12/11/2018			12/11/2018 17:22	Jhamieka S. Greenwood	2047967
SM 2120 B	12/11/2018			12/11/2018 17:13	Chelsea Hernandez	2047965
	12/11/2018			12/11/2018 17:14	Chelsea Hernandez	2047968
	12/11/2018			12/11/2018 17:15	Chelsea Hernandez	2047969
SM 2320 B-97	12/11/2018			12/13/2018 01:26	Lauren Bottorf	2047965
	12/11/2018			12/13/2018 01:37	Lauren Bottorf	2047968
	12/11/2018			12/13/2018 01:47	Lauren Bottorf	2047969
SM 2540 C-97	12/11/2018			12/13/2018 23:45	Yijie Li	2047965, 2047968, 2047969
SM 2540 D-97	12/11/2018			12/13/2018 23:45	Yijie Li	2047965, 2047968, 2047969
SM 4500 F-C-97	12/11/2018			12/13/2018 01:26	Lauren Bottorf	2047965
	12/11/2018			12/13/2018 01:37	Lauren Bottorf	2047968
	12/11/2018			12/13/2018 01:47	Lauren Bottorf	2047969
SM 5310 B-00	12/11/2018			12/13/2018 01:38	Megan Treadwell	2047966
	12/11/2018			12/13/2018 01:51	Megan Treadwell	2047970
	12/11/2018			12/13/2018 02:30	Megan Treadwell	2047971