

Chemical Analysis Report

SO-DIST-2018-11-15-01

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

Event Description: **Peace River Streams**
Request ID: **RQ-2018-11-05-27**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
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FLDEP South District Office
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 10-DEC-2018 14:26



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: RunoffPeace River Site3

Collection Date/Time: 11/14/2018 09:00

Field ID: G3SD0132

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041671	EPA 180.1 Rev. 2.0	Turbidity	18	A	NTU	P354767	
	EPA 300.0 Rev. 2.1	Chloride	32		mg Cl/L	P355285	
		Sulfate	19		mg SO4/L	P355288	
	SM 2120 B	Color (true)	120		PCU	P354778	
	SM 2320 B-97	Total Alkalinity	55		mg CaCO3/L	P355201	
	SM 2540 C-97	TDS	198		mg/L	P355134	
	SM 2540 D-97	TSS	8	I	mg/L	P354859	
	SM 4500 F-C-97	Fluoride	0.42		mg F/L	P355279	
2041673	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P355066	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P354906	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.027		mg N/L	P355077	
	EPA 365.1 Rev. 2.0	Total-P	0.72		mg P/L	P354924	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P354886	
2041675	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.41		mg P/L	P354772	

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: MyrtleSlough@PinelIsland

Collection Date/Time: 11/14/2018 09:50

Field ID: G3SD0095

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041677	EPA 180.1 Rev. 2.0	Turbidity	15		NTU	P354767	
	EPA 300.0 Rev. 2.1	Chloride	35		mg Cl/L	P355285	
		Sulfate	14		mg SO4/L	P355288	
	SM 2120 B	Color (true)	45	A	PCU	P354778	
	SM 2320 B-97	Total Alkalinity	255		mg CaCO3/L	P355202	RPD
	SM 2540 C-97	TDS	369		mg/L	P355134	
	SM 2540 D-97	TSS	6	I	mg/L	P354859	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P355279	
2041678	EPA 350.1 Rev. 2.0	Ammonia-N	0.34		mg N/L	P355245	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P354906	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.36		mg N/L	P355077	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P354924	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P354886	
2041679	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P354772	
2041702	EPA 200.7 Rev. 4.4	Calcium	105		mg/L	P354910	
		Iron	1.94E+03		ug/L	P354910	
		Magnesium	5.48		mg/L	P354910	
		Potassium	1.4		mg/L	P354910	
		Sodium	27.0		mg/L	P354910	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P354910	
		Arsenic	1.67		ug/L	P354910	
		Cadmium	0.020	U	ug/L	P354910	
		Chromium	0.41	I	ug/L	P354910	
		Copper	0.20	U	ug/L	P354910	
		Lead	0.076	I	ug/L	P354910	
		Nickel	0.28	I	ug/L	P354910	
		Silver	0.010	U	ug/L	P354910	

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: Hog Bay @ CR 763

Collection Date/Time: 11/14/2018 10:30

Field ID: G3SD0096

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041672	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P354767	
	EPA 300.0 Rev. 2.1	Chloride	180		mg Cl/L	P355285	
		Sulfate	45		mg SO4/L	P355288	
	SM 2120 B	Color (true)	73	A	PCU	P354774	
	SM 2320 B-97	Total Alkalinity	135		mg CaCO3/L	P355201	
	SM 2540 C-97	TDS	504	A	mg/L	P355134	
	SM 2540 D-97	TSS	4	IA	mg/L	P354859	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P355279	
2041674	EPA 350.1 Rev. 2.0	Ammonia-N	0.062		mg N/L	P355066	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P354906	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.17		mg N/L	P355077	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P354924	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P354886	
2041676	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.17		mg P/L	P354772	

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: P354767

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354910

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: P354910

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: P355285

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355288

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355066

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355245

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: P354906

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355077

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354924

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354772

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

Reference Method: SM 2120 B
Batch ID: P354774

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P354778

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P355201

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

Reference Method: SM 2320 B-97
Batch ID: P355202

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

Reference Method: SM 2540 C-97
Batch ID: P355134

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P354859

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P355279

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P354886

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: P354910

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	106		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	101		P	85 - 115
Sodium	105		P	85 - 115
Zinc	94.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354910

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	107		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	108		P	85 - 115
Copper	104		P	85 - 115
Lead	101		P	85 - 115
Nickel	103		P	85 - 115
Silver	99.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355285

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355288

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355066

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354906

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355077

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354924

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354772

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

Reference Method: SM 2120 B
Batch ID: P354774

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.5		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P354778

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P355201

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

Reference Method: SM 2320 B-97
Batch ID: P355202

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P355279

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.4		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354886

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041687	Calcium	106		P	80 - 120
2041687	Iron	101		P	80 - 120
2041687	Magnesium	103		P	80 - 120
2041687	Potassium	98.0		P	80 - 120
2041687	Sodium	107		P	80 - 120
2041687	Zinc	97.0		P	80 - 120
2041739	Calcium	104		P	80 - 120
2041739	Iron	111	106	P/P	80 - 120
2041739	Magnesium	113	106	P/P	80 - 120
2041739	Potassium	108	101	P/P	80 - 120
2041739	Sodium	104		P	80 - 120
2041739	Zinc	103	97.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041687	Arsenic	112		P	80 - 120
2041687	Cadmium	108		P	80 - 120
2041687	Chromium	103		P	80 - 120
2041687	Copper	101		P	80 - 120
2041687	Lead	105		P	80 - 120
2041687	Nickel	103		P	80 - 120
2041687	Silver	100		P	80 - 120
2041739	Arsenic	109	110	P/P	80 - 120
2041739	Cadmium	108	106	P/P	80 - 120
2041739	Chromium	99.1	98.1	P/P	80 - 120
2041739	Copper	104	104	P/P	80 - 120
2041739	Lead	104	104	P/P	80 - 120
2041739	Nickel	103	104	P/P	80 - 120
2041739	Silver	100	100	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355285

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041584	Chloride	97.4		P	90 - 110
2041671	Chloride	99.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355288

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041584	Sulfate	95.2		P	90 - 110
2041671	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355066

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041682	Ammonia-N	95.6	96.5	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355245

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2042506	Ammonia-N	101	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041670	Kjeldahl Nitrogen	99.3	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041642	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354924

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041682	Total-P	105	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354772

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041610	O-Phosphate-P	95.5	97.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P355279

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041712	Fluoride	104	104	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354886

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041615	Organic Carbon	94.6	94.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P354767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041671	Turbidity	1.14	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041739	Calcium	4.22	Spike	P	0 - 20
2041739	Iron	4.50	Spike	P	0 - 20
2041739	Magnesium	4.67	Spike	P	0 - 20
2041739	Potassium	4.59	Spike	P	0 - 20
2041739	Sodium	5.23	Spike	P	0 - 20
2041739	Zinc	5.16	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041739	Arsenic	0.355	Spike	P	0 - 20
2041739	Cadmium	1.63	Spike	P	0 - 20
2041739	Chromium	0.967	Spike	P	0 - 20
2041739	Copper	0.0897	Spike	P	0 - 20
2041739	Lead	0.118	Spike	P	0 - 20
2041739	Nickel	0.694	Spike	P	0 - 20
2041739	Silver	0.127	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355285

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041584	Chloride	0.471	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355288

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041584	Sulfate	0.954	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355066

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041682	Ammonia-N	0.480	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2042506	Ammonia-N	2.98	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041670	Kjeldahl Nitrogen	2.49	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041642	NO2NO3-N	0.595	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354924

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041682	Total-P	1.21	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354772

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041610	O-Phosphate-P	2.17	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P354774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041672	Color (true)	3.86	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P354778

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041677	Color (true)	2.39	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P355201

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041636	Total Alkalinity	0.861	Sample	P	0 - 1.6

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P355202

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041712	Total Alkalinity	2.84	Sample	F	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P355134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041672	TDS	2.97	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P355279

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041712	Fluoride	0.490	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P354886

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041615	Organic Carbon	0.336	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 180.1 Rev. 2.0

Run ID: A87801

Included Lab Sample IDs: 2041671, 2041672, 2041677

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: A87803

Included Lab Sample IDs: 2041675, 2041676, 2041679

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	98.6	P/P	90 - 110
O-Phosphate-P	99.2	99.2	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A87804

Included Lab Sample IDs: 2041671, 2041672, 2041677

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	85 - 115
Color (true)	102	102	P/P	85 - 115

Reference Method: SM 5310 B-00

Run ID: A87846

Included Lab Sample IDs: 2041673, 2041674, 2041678

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.6	93.8	P/P	90 - 110
Organic Carbon	93.8	94.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A87892

Included Lab Sample IDs: 2041678

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A87893

Included Lab Sample IDs: 2041673, 2041674

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A87899

Included Lab Sample IDs: 2041673, 2041674, 2041678

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.3	96.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A87940

Included Lab Sample IDs: 2041702

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	101	P/P	90 - 110
Iron	106	101	P/P	90 - 110
Magnesium	105	101	P/P	90 - 110
Potassium	102	99.6	P/P	90 - 110
Sodium	105	103	P/P	90 - 110
Zinc	99.9	97.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A87941

Included Lab Sample IDs: 2041673, 2041674

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87944

Included Lab Sample IDs: 2041702

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	101	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	104	103	P/P	90 - 110
Copper	102	101	P/P	90 - 110
Lead	99.9	101	P/P	90 - 110
Nickel	102	100	P/P	90 - 110
Silver	97.4	96.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A87949

Included Lab Sample IDs: 2041673, 2041674, 2041678

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A87993

Included Lab Sample IDs: 2041671, 2041672, 2041677

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Chloride	101	102	P/P	90 - 110
Sulfate	100	101	P/P	90 - 110
Sulfate	101	102	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A87999

Included Lab Sample IDs: 2041671, 2041672, 2041677

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88015

Included Lab Sample IDs: 2041678

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88028

Included Lab Sample IDs: 2041671, 2041672, 2041677

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.5	P/P	90 - 110
Fluoride	99.5	100	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					1.14	
EPA 200.7 Rev. 4.4	Calcium	103	106	104			4.22
	Iron	106	101	111	106		4.50
	Magnesium	108	103	113	106		4.67
	Potassium	101	98.0	108	101		4.59
	Sodium	105	107	104			5.23
	Zinc	94.6	97.0	103	97.7		5.16
EPA 200.8 Rev. 5.4	Arsenic	107	112	109	110		0.355
	Cadmium	104	108	108	106		1.63
	Chromium	108	103	99.1	98.1		0.967
	Copper	104	101	104	104		0.0897
	Lead	101	105	104	104		0.118
	Nickel	103	103	103	104		0.694
	Silver	99.0	100	100	100		0.127
EPA 300.0 Rev. 2.1	Chloride	99.3	97.4	99.1		0.471	
	Sulfate	98.3	95.2	101		0.954	
EPA 350.1 Rev. 2.0	Ammonia-N	100	95.6	96.5			0.480
	Ammonia-N	95.2	101	97.0			2.98
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	99.3	103			2.49
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	102	102			0.595
EPA 365.1 Rev. 2.0	Total-P	105	105	103			1.21
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	95.5	97.8			2.17
SM 2120 B	Color (true)	99.5				3.86	
	Color (true)	100				2.39	
SM 2320 B-97	Total Alkalinity	102				0.861	
	Total Alkalinity	100				2.84	
SM 2540 C-97	TDS					2.97	
SM 4500 F-C-97	Fluoride	98.4	104	104			0.490
SM 5310 B-00	Organic Carbon	93.2	94.6	94.2			0.336

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2041671, 2041672, 2041677
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2041702
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2041702
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2041671, 2041672, 2041677
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2041671, 2041672, 2041677
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2041673, 2041674, 2041678
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2041673, 2041674, 2041678
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2041673, 2041674, 2041678
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2041673, 2041674, 2041678
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2041675, 2041676, 2041679
SM 2120 B / E31780	True Color measured at 450 nm	2041671, 2041672, 2041677
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2041671, 2041672, 2041677

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2041671, 2041672, 2041677
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2041671, 2041672, 2041677
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2041671, 2041672, 2041677
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2041673, 2041674, 2041678

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	11/15/2018			11/15/2018 16:42	Megan Treadwell	2041671, 2041672, 2041677
EPA 200.7 Rev. 4.4	11/15/2018	11/19/2018 13:25	Elliott D. Healy	11/20/2018 16:46	Betina Topolski	2041702
EPA 200.8 Rev. 5.4	11/15/2018	11/19/2018 13:25	Elliott D. Healy	11/21/2018 18:50	Allison Taylor	2041702
EPA 300.0 Rev. 2.1	11/15/2018			11/28/2018 17:11	Lipi Saha	2041671
	11/15/2018			11/28/2018 19:48	Lipi Saha	2041672
	11/15/2018			11/28/2018 20:00	Lipi Saha	2041677
EPA 350.1 Rev. 2.0	11/15/2018			11/21/2018 13:57	Adrian Shelby	2041673
	11/15/2018			11/21/2018 13:58	Adrian Shelby	2041674
	11/15/2018			11/28/2018 12:21	Ping Hua	2041678
EPA 351.2 Rev. 2.0	11/15/2018	11/19/2018 15:45	Adrian Shelby	11/20/2018 14:20	Joseph Suarez	2041673
	11/15/2018	11/19/2018 15:45	Adrian Shelby	11/20/2018 14:22	Joseph Suarez	2041674
	11/15/2018	11/19/2018 15:45	Adrian Shelby	11/20/2018 14:23	Joseph Suarez	2041678
EPA 353.2 Rev. 2.0	11/15/2018			11/26/2018 10:40	Beverly Y. Sanders	2041673
	11/15/2018			11/26/2018 10:41	Beverly Y. Sanders	2041674
	11/15/2018			11/26/2018 10:42	Beverly Y. Sanders	2041678
EPA 365.1 Rev. 2.0	11/15/2018	11/19/2018 13:00	Sima Feizi	11/20/2018 12:32	Beverly Y. Sanders	2041673
	11/15/2018	11/19/2018 13:00	Sima Feizi	11/20/2018 12:33	Beverly Y. Sanders	2041674
	11/15/2018	11/19/2018 13:00	Sima Feizi	11/20/2018 14:18	Beverly Y. Sanders	2041678
EPA 365.1 Rev. 2.0 dissolved	11/15/2018			11/15/2018 17:53	Jhamieka S. Greenwood	2041675
	11/15/2018			11/15/2018 18:03	Jhamieka S. Greenwood	2041676
	11/15/2018			11/15/2018 18:04	Jhamieka S. Greenwood	2041679
SM 2120 B	11/15/2018			11/15/2018 17:09	Chelsea Hernandez	2041672
	11/15/2018			11/15/2018 17:38	Chelsea Hernandez	2041671
	11/15/2018			11/15/2018 17:39	Chelsea Hernandez	2041677
SM 2320 B-97	11/15/2018			11/21/2018 07:01	Dale L. Simmons	2041671
	11/15/2018			11/21/2018 07:11	Dale L. Simmons	2041672
	11/15/2018			11/21/2018 08:35	Dale L. Simmons	2041677
SM 2540 C-97	11/15/2018			11/16/2018 17:06	Yijie Li	2041671, 2041672, 2041677
SM 2540 D-97	11/15/2018			11/16/2018 17:06	Yijie Li	2041671, 2041672, 2041677
SM 4500 F-C-97	11/15/2018			11/29/2018 04:56	Dale L. Simmons	2041677
	11/15/2018			11/29/2018 06:09	Dale L. Simmons	2041671
	11/15/2018			11/29/2018 06:13	Dale L. Simmons	2041672
SM 5310 B-00	11/15/2018			11/17/2018 00:42	Megan Treadwell	2041673
	11/15/2018			11/17/2018 00:55	Megan Treadwell	2041674
	11/15/2018			11/17/2018 01:36	Megan Treadwell	2041678