

Chemical Analysis Report

NW-DIST-2018-03-14-03

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

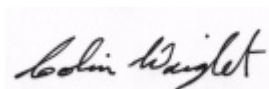
Event Description: **Escambia River Run**
Request ID: **RQ-2018-03-12-44**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 23-APR-2018 15:29



NON-CONFORMANCE REPORT INCLUDED

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: ESCAMBIA RIVER UPSTREAM

Collection Date/Time: 03/12/2018 11:10

Field ID: G4NW0404

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974721	EPA 180.1 Rev. 2.0	Turbidity	16	Q	NTU	P341554	
	EPA 300.0 Rev. 2.1	Chloride	6.1		mg Cl/L	P342127	
		Sulfate	5.7		mg SO4/L	P342131	
	SM 2120 B	Color (true)	23	Q	PCU	P341561	
	SM 2320 B-97	Total Alkalinity	28		mg CaCO3/L	P341930	RPD
	SM 2540 C-97	TDS	71		mg/L	P342012	
	SM 2540 D-97	TSS	15		mg/L	P341865	
	SM 4500 F-C-97	Fluoride	0.038	I	mg F/L	P342154	
1974723	EPA 350.1 Rev. 2.0	Ammonia-N	0.066		mg N/L	P342075	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.34		mg N/L	P341755	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.26		mg N/L	P341733	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P341742	
	SM 5310 B-00	Organic Carbon	5.0		mg C/L	P342185	
1974725	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.017	Q	mg P/L	P341705	
1974736	EPA 200.7 Rev. 4.4	Calcium	11.1		mg/L	P341685	
		Iron	1.82E+03		ug/L	P341685	
		Magnesium	1.41		mg/L	P341685	
		Potassium	1.0	I	mg/L	P341685	
		Sodium	6.0		mg/L	P341685	
		Zinc	5.0	U	ug/L	P341685	
	EPA 200.8 Rev. 5.4	Arsenic	0.69		ug/L	P341685	
		Cadmium	0.020	U	ug/L	P341685	
		Chromium	1.1	I	ug/L	P341685	
		Copper	0.52	I	ug/L	P341685	
		Lead	0.52		ug/L	P341685	
		Nickel	0.78	I	ug/L	P341685	
		Silver	0.010	U	ug/L	P341685	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The sample expired upon receipt.

SM 2120 B: The sample expired upon receipt.

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

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium, potassium, and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: ESCAMBIA RIVER DOWNSTREAM

Collection Date/Time: 03/12/2018 12:10

Field ID: G4NW0403

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974722	EPA 180.1 Rev. 2.0	Turbidity	18	Q	NTU	P341554	
	EPA 300.0 Rev. 2.1	Chloride	5.8		mg Cl/L	P342127	
		Sulfate	5.5		mg SO4/L	P342131	
	SM 2120 B	Color (true)	23	Q	PCU	P341561	
	SM 2320 B-97	Total Alkalinity	27		mg CaCO3/L	P341930	RPD
	SM 2540 C-97	TDS	67		mg/L	P342012	
	SM 2540 D-97	TSS	14		mg/L	P341865	

Field ID: G4NW0403

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974722	SM 4500 F-C-97	Fluoride	0.040	I	mg F/L	P342154	
1974724	EPA 350.1 Rev. 2.0	Ammonia-N	0.047		mg N/L	P342075	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.34		mg N/L	P341755	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.26		mg N/L	P341733	
	EPA 365.1 Rev. 2.0	Total-P	0.045		mg P/L	P341742	
	SM 5310 B-00	Organic Carbon	5.2		mg C/L	P342185	
1974726	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014	Q	mg P/L	P341705	
1974737	EPA 200.7 Rev. 4.4	Calcium	10.7		mg/L	P341685	
		Iron	1.67E+03		ug/L	P341685	
		Magnesium	1.39		mg/L	P341685	
		Potassium	1.0	I	mg/L	P341685	
		Sodium	5.6		mg/L	P341685	
		Zinc	5.0	U	ug/L	P341685	
	EPA 200.8 Rev. 5.4	Arsenic	0.65		ug/L	P341685	
		Cadmium	0.020	U	ug/L	P341685	
		Chromium	0.96	I	ug/L	P341685	
		Copper	0.48	I	ug/L	P341685	
		Lead	0.51		ug/L	P341685	
		Nickel	0.70	I	ug/L	P341685	
		Silver	0.010	U	ug/L	P341685	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The sample expired upon receipt.

SM 2120 B: The sample expired upon receipt.

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

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium, potassium, and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: ESCAMBIA RIVER UPSTREAM

Collection Date/Time: 03/12/2018 13:30

Field ID: G4NW0264

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1974727	EPA 180.1 Rev. 2.0	Turbidity	14	Q	NTU	P341554	
	EPA 300.0 Rev. 2.1	Chloride	170		mg Cl/L	P342127	
		Sulfate	29		mg SO4/L	P342131	
	SM 2120 B	Color (true)	66	Q	PCU	P341560	
	SM 2320 B-97	Total Alkalinity	26		mg CaCO3/L	P341930	RPD
	SM 2540 C-97	TDS	340		mg/L	P342012	
	SM 2540 D-97	TSS	7	I	mg/L	P341865	
	SM 4500 F-C-97	Fluoride	0.045	I	mg F/L	P342154	
1974728	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P342075	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29		mg N/L	P341755	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.24		mg N/L	P341733	
	EPA 365.1 Rev. 2.0	Total-P	0.035		mg P/L	P341742	
	SM 5310 B-00	Organic Carbon	4.9		mg C/L	P342185	
1974729	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	IQ	mg P/L	P341705	

Field ID: G4NW0264

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
Ref. Method and Comment:							
EPA 180.1 Rev. 2.0: The sample expired upon receipt.							
SM 2120 B: The sample expired upon receipt.							
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.							
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.							

Non-Conformance Report

NCR ID: 6934

Event(s)

Job(s)

Sample(s)

Test(s)

NW-DIST-2018-03-14-03

NCR Type: SHIPPING/RECEIVING

NCR Category: Samples arrived late

Observation: Samples arrived one or more days late by FedEx, samples received within the acceptable temperature range.

Resolution: Customer contacted, email correspondence attached to sample submittal forms. Data will be qualified as appropriate.

Authorized by/Date: Joshua Ayres 3/20/2018

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
 Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P341554

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P341685

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: P341685

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342127

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342131

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342075

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341755

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341733

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341742

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341705

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

Reference Method: SM 2120 B
Batch ID: P341560

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P341561

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P341930

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P342012

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P341865

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P342154

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P342185

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: P341685

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	112		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	99.1		P	85 - 115
Sodium	101		P	85 - 115
Zinc	108		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341685

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	107		P	85 - 115
Chromium	104		P	85 - 115
Copper	103		P	85 - 115
Lead	103		P	85 - 115
Nickel	102		P	85 - 115
Silver	102		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342127

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342131

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342075

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	90.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341755

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341733

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341742

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341705

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

Reference Method: SM 2320 B-97
Batch ID: P341930

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

Reference Method: SM 4500 F-C-97
Batch ID: P342154

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.3		P	91 - 105

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P342185

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341685

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974672	Iron	106	107	P/P	80 - 120
1974672	Zinc	110	105	P/P	80 - 120
1974685	Calcium	104		P	80 - 120
1974685	Iron	112		P	80 - 120
1974685	Magnesium	114		P	80 - 120
1974685	Potassium	106		P	80 - 120
1974685	Sodium	104		P	80 - 120
1974685	Zinc	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341685

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974672	Arsenic	109	109	P/P	80 - 120
1974672	Cadmium	103	101	P/P	80 - 120
1974672	Chromium	97.0	97.2	P/P	80 - 120
1974672	Copper	95.0	95.3	P/P	80 - 120
1974672	Lead	108	107	P/P	80 - 120
1974672	Nickel	90.1	89.6	P/P	80 - 120
1974672	Silver	96.2	96.4	P/P	80 - 120
1974685	Arsenic	102		P	80 - 120
1974685	Cadmium	105		P	80 - 120
1974685	Chromium	99.0		P	80 - 120
1974685	Copper	94.3		P	80 - 120
1974685	Lead	103		P	80 - 120
1974685	Nickel	95.6		P	80 - 120
1974685	Silver	101		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342127

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974679	Chloride	103		P	90 - 110
1974863	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974679	Sulfate	106		P	90 - 110
1974863	Sulfate	106		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974705	Ammonia-N	93.1	93.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341755

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974867	Kjeldahl Nitrogen	106	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341733

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974646	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341742

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974868	Total-P	103	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341705

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974708	O-Phosphate-P	101	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P342154

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974865	Fluoride	95.0	96.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342185

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1974680	Organic Carbon	98.6	100	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P341554

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974679	Turbidity	1.64	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P341685

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974672	Calcium	3.25	Spike	P	0 - 20
1974672	Iron	0.134	Spike	P	0 - 20
1974672	Magnesium	3.01	Spike	P	0 - 20
1974672	Potassium	2.66	Spike	P	0 - 20
1974672	Sodium	4.00	Spike	P	0 - 20
1974672	Zinc	5.04	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P341685

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974672	Arsenic	0.0524	Spike	P	0 - 20
1974672	Cadmium	2.26	Spike	P	0 - 20
1974672	Chromium	0.156	Spike	P	0 - 20
1974672	Copper	0.399	Spike	P	0 - 20
1974672	Lead	0.718	Spike	P	0 - 20
1974672	Nickel	0.555	Spike	P	0 - 20
1974672	Silver	0.145	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342127

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974679	Chloride	0.267	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974679	Sulfate	0.0839	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974705	Ammonia-N	0.758	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341755

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974867	Kjeldahl Nitrogen	3.99	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974646	NO2NO3-N	0.428	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341742

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974868	Total-P	2.33	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974708	O-Phosphate-P	1.94	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P341560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974703	Color (true)	1.08	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P341561

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974500	Color (true)	1.60	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P341930

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974865	Total Alkalinity	2.13	Sample	F	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P342012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974634	TDS	3.08	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P342154

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974865	Fluoride	1.42	Spike	P	0 - 3.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P342185

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1974680	Organic Carbon	1.55	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: A82608
Included Lab Sample IDs: 1974721, 1974722, 1974727

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A82609
Included Lab Sample IDs: 1974721, 1974722, 1974727

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A82664
Included Lab Sample IDs: 1974725, 1974726, 1974729

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A82687
Included Lab Sample IDs: 1974723, 1974724, 1974728

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A82709
Included Lab Sample IDs: 1974736, 1974737

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	103	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	104	104	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A82750

Included Lab Sample IDs: 1974721, 1974722, 1974727

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.7	100	P/P	90 - 110
Chloride	97.9	97.7	P/P	90 - 110
Sulfate	97.2	102	P/P	90 - 110
Sulfate	97.3	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82757

Included Lab Sample IDs: 1974723, 1974724, 1974728

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.6	96.3	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A82760

Included Lab Sample IDs: 1974721, 1974722, 1974727

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.4	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82773

Included Lab Sample IDs: 1974723, 1974724, 1974728

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82797

Included Lab Sample IDs: 1974723, 1974724, 1974728

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

Reference Method: SM 4500 F-C-97

Run ID: A82826

Included Lab Sample IDs: 1974721, 1974722, 1974727

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

Reference Method: SM 5310 B-00

Run ID: A82844

Included Lab Sample IDs: 1974723, 1974724, 1974728

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.6	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
 Run ID: A82987
 Included Lab Sample IDs: 1974736, 1974737

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	102	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	99.6	98.1	P/P	90 - 110
Copper	101	99.2	P/P	90 - 110
Lead	102	101	P/P	90 - 110
Nickel	100	97.6	P/P	90 - 110
Silver	104	103	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						1.64	
EPA 200.7 Rev. 4.4	Calcium	104	104					3.25
	Iron	112	106	107	112			0.134
	Magnesium	104	114					3.01
	Potassium	99.1	106					2.66
	Sodium	101	104					4.00
	Zinc	108	110	105	104			5.04
EPA 200.8 Rev. 5.4	Arsenic	104	109	109	102			0.0524
	Cadmium	107	103	101	105			2.26
	Chromium	104	97.0	97.2	99.0			0.156
	Copper	103	95.0	95.3	94.3			0.399
	Lead	103	108	107	103			0.718
	Nickel	102	90.1	89.6	95.6			0.555
	Silver	102	96.2	96.4	101			0.145
EPA 300.0 Rev. 2.1	Chloride	103	103	103			0.267	
	Sulfate	105	106	106			0.0839	
EPA 350.1 Rev. 2.0	Ammonia-N	90.1	93.1	93.9				0.758
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.2	106	102				3.99
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102					0.428
EPA 365.1 Rev. 2.0	Total-P	100	103	100				2.33
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	101	104				1.94
SM 2120 B	Color (true)						1.08	
	Color (true)						1.60	
SM 2320 B-97	Total Alkalinity	100					2.13	
SM 2540 C-97	TDS						3.08	
SM 4500 F-C-97	Fluoride	97.3	95.0	96.5				1.42
SM 5310 B-00	Organic Carbon	98.6	98.6	100				1.55

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
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Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1974721, 1974722, 1974727
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1974736, 1974737
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1974736, 1974737
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1974721, 1974722, 1974727
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1974721, 1974722, 1974727
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1974723, 1974724, 1974728
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1974723, 1974724, 1974728
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1974723, 1974724, 1974728
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1974723, 1974724, 1974728
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1974725, 1974726, 1974729
SM 2120 B / E31780	True Color measured at 450 nm	1974721, 1974722, 1974727
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1974721, 1974722, 1974727
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1974721, 1974722, 1974727
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1974721, 1974722, 1974727
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1974721, 1974722, 1974727
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1974723, 1974724, 1974728

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	03/14/2018			03/14/2018 16:12	DeAsia Armster	1974721, 1974722, 1974727
EPA 200.7 Rev. 4.4	03/14/2018	03/16/2018 13:00	Vijayalakshmi Reddy	03/19/2018 18:38	Betina Topolski	1974736
	03/14/2018	03/16/2018 13:00	Vijayalakshmi Reddy	03/19/2018 18:46	Betina Topolski	1974737
EPA 200.8 Rev. 5.4	03/14/2018	03/16/2018 13:00	Vijayalakshmi Reddy	03/30/2018 15:23	Robert K Palmer	1974736
	03/14/2018	03/16/2018 13:00	Vijayalakshmi Reddy	03/30/2018 15:33	Robert K Palmer	1974737
EPA 300.0 Rev. 2.1	03/14/2018			03/21/2018 13:07	Julia Storbeck	1974721
	03/14/2018			03/21/2018 13:43	Julia Storbeck	1974722
	03/14/2018			03/21/2018 13:55	Julia Storbeck	1974727
EPA 350.1 Rev. 2.0	03/14/2018			03/22/2018 13:49	Ping Hua	1974723
	03/14/2018			03/22/2018 13:51	Ping Hua	1974724
	03/14/2018			03/22/2018 13:59	Ping Hua	1974728
EPA 351.2 Rev. 2.0	03/14/2018	03/19/2018 15:30	Adrian Shelby	03/21/2018 10:19	Joseph Suarez	1974723
	03/14/2018	03/19/2018 15:30	Adrian Shelby	03/21/2018 10:21	Joseph Suarez	1974724
	03/14/2018	03/19/2018 15:30	Adrian Shelby	03/21/2018 10:22	Joseph Suarez	1974728
EPA 353.2 Rev. 2.0	03/14/2018			03/19/2018 10:16	Beverly Y. Sanders	1974723
	03/14/2018			03/19/2018 10:17	Beverly Y. Sanders	1974724
	03/14/2018			03/19/2018 10:19	Beverly Y. Sanders	1974728
EPA 365.1 Rev. 2.0	03/14/2018	03/19/2018 12:20	Sima Feizi	03/21/2018 15:04	Lipi Saha	1974723
	03/14/2018	03/19/2018 12:20	Sima Feizi	03/21/2018 15:05	Lipi Saha	1974724
	03/14/2018	03/19/2018 12:20	Sima Feizi	03/21/2018 15:06	Lipi Saha	1974728
EPA 365.1 Rev. 2.0 dissolved	03/14/2018			03/16/2018 12:24	Megan Treadwell	1974725
	03/14/2018			03/16/2018 12:25	Megan Treadwell	1974726
	03/14/2018			03/16/2018 12:26	Megan Treadwell	1974729
SM 2120 B	03/14/2018			03/14/2018 16:11	Tanya Welborn	1974727
	03/14/2018			03/14/2018 16:27	Tanya Welborn	1974721, 1974722
SM 2320 B-97	03/14/2018			03/21/2018 04:49	Dale L. Simmons	1974721
	03/14/2018			03/21/2018 05:00	Dale L. Simmons	1974722
	03/14/2018			03/21/2018 05:10	Dale L. Simmons	1974727
SM 2540 C-97	03/14/2018			03/17/2018 23:14	Yijie Li	1974721, 1974722, 1974727
SM 2540 D-97	03/14/2018			03/17/2018 23:14	Yijie Li	1974721, 1974722, 1974727
SM 4500 F-C-97	03/14/2018			03/24/2018 05:39	Dale L. Simmons	1974721
	03/14/2018			03/24/2018 05:43	Dale L. Simmons	1974722
	03/14/2018			03/24/2018 05:46	Dale L. Simmons	1974727
SM 5310 B-00	03/14/2018			03/23/2018 23:24	Julia Storbeck	1974723
	03/14/2018			03/23/2018 23:39	Julia Storbeck	1974724
	03/14/2018			03/23/2018 23:53	Julia Storbeck	1974728