

Chemical Analysis Report

WQAP-2017-08-23-07

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

Event Description: **kit C (3310 Aucilla River) , (3573B Steinhatchee River)**

Request ID: **RQ-2017-08-14-45**

Customer: **WQAP**

Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
MS #3560
Tallahassee, FL 32399-2400
Attn: Michael Eckles

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: Liang Lin, Environmental Administrator

Date Certified: 18-SEP-2017 15:33

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

Case Narrative

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

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

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

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

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Aucilla River @ Lamont Tract

Collection Date/Time: 08/23/2017 10:25

Field ID: G1TLHR0019-2017-05

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1923930	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P330823	
	EPA 300.0 Rev. 2.1	Chloride	4.0		mg Cl/L	P330840	
	SM 2120 B	Color (true)	500		PCU	P330744	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P330955	
	SM 2540 C-97	TDS	114		mg/L	P331045	
	SM 2540 D-97	TSS	2	I	mg/L	P331178	
	SM 4500 F-C-97	Fluoride	0.052	I	mg F/L	P330957	
1923932	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P331096	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P330868	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.034		mg N/L	P330852	
	EPA 365.1 Rev. 2.0	Total-P	0.079		mg P/L	P330877	
	SM 5310 B-00	Organic Carbon	40		mg C/L	P330972	
1923934	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.049		mg P/L	P330731	
1923938	EPA 200.7 Rev. 4.4	Iron	1.38E+03		ug/L	P330940	
		Zinc	5.0	U	ug/L	P330940	
	EPA 200.8 Rev. 5.4	Arsenic	0.48		ug/L	P330940	
		Cadmium	0.020	U	ug/L	P330940	
		Chromium	0.64	I	ug/L	P330940	
		Copper	0.25	I	ug/L	P330940	
		Lead	0.33		ug/L	P330940	
		Nickel	0.68	I	ug/L	P330940	
		Silver	0.010	U	ug/L	P330940	

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: Steinhatchee River @ 40m N of SE Yearling Rd Collection Date/Time: 08/23/2017 12:25

Field ID: G1TLHR0065-2017-05

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1923931	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P330823	
	EPA 300.0 Rev. 2.1	Chloride	4.9		mg Cl/L	P330841	
	SM 2120 B	Color (true)	460		PCU	P330816	
	SM 2320 B-97	Total Alkalinity	82		mg CaCO3/L	P330955	
	SM 2540 C-97	TDS	150		mg/L	P331045	
	SM 2540 D-97	TSS	3	I	mg/L	P331178	
	SM 4500 F-C-97	Fluoride	0.11		mg F/L	P330957	
1923933	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P331096	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P330868	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P330852	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P330877	
	SM 5310 B-00	Organic Carbon	37		mg C/L	P330972	
1923935	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P330812	
1923939	EPA 200.7 Rev. 4.4	Iron	940		ug/L	P330940	
		Zinc	5.0	U	ug/L	P330940	

Field ID: G1TLHR0065-2017-05

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1923939	EPA 200.8 Rev. 5.4	Arsenic	0.38		ug/L	P330940	
		Cadmium	0.020	U	ug/L	P330940	
		Chromium	0.58	I	ug/L	P330940	
		Copper	0.20	U	ug/L	P330940	
		Lead	0.18	I	ug/L	P330940	
		Nickel	0.33	I	ug/L	P330940	
		Silver	0.010	U	ug/L	P330940	

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: P330823

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P330940

Component	Result	Code	Units
Iron	30	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330940

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: P330840

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330841

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331096

Component	Result	Code	Units
-----------	--------	------	-------

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331096

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330868

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330852

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330877

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330731

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330812

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

Reference Method: SM 2120 B
Batch ID: P330744

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P330816

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P330955

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P331045

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P331178

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P330957

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P330972

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: P330940

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	107		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330940

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	97.3		P	85 - 115
Chromium	98.0		P	85 - 115
Copper	95.7		P	85 - 115
Lead	97.2		P	85 - 115
Nickel	98.1		P	85 - 115
Silver	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330840

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330841

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331096

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330868

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330852

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330877

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330731

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330812

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

Reference Method: SM 2320 B-97
Batch ID: P330955

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P330957

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P330972

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P330940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923927	Iron	106		P	80 - 120
1923927	Zinc	98.2		P	80 - 120
1924613	Iron	106	105	P/P	80 - 120
1924613	Zinc	97.6	99.9	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P330940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923927	Arsenic	104		P	80 - 120
1923927	Cadmium	99.5		P	80 - 120
1923927	Chromium	96.8		P	80 - 120
1923927	Copper	92.8		P	80 - 120
1923927	Lead	98.4		P	80 - 120
1923927	Nickel	95.4		P	80 - 120
1923927	Silver	103		P	80 - 120
1924613	Arsenic	105	105	P/P	80 - 120
1924613	Cadmium	99.1	101	P/P	80 - 120
1924613	Chromium	97.0	97.1	P/P	80 - 120
1924613	Copper	93.8	94.0	P/P	80 - 120
1924613	Lead	99.1	99.0	P/P	80 - 120
1924613	Nickel	96.6	96.8	P/P	80 - 120
1924613	Silver	105	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P330840

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923773	Chloride	96.1		P	90 - 110
1923912	Chloride	90.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P330841

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1924248	Chloride	98.1		P	90 - 110
1924249	Chloride	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P331096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
---------------	-----------	---------	---------	-----------	----------------

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923921	Ammonia-N	101	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330868

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923946	Kjeldahl Nitrogen	91.3	90.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330852

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923913	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330877

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923921	Total-P	99.0	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330731

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923784	O-Phosphate-P	93.7	95.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330812

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923964	O-Phosphate-P	93.7	97.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P330957

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923920	Fluoride	98.1	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P330972

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1923932	Organic Carbon	105		P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P330823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1924339	Turbidity	4.53	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P330940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1924613	Iron	0.533	Spike	P	0 - 20
1924613	Zinc	2.31	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P330940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1924613	Arsenic	0.0697	Spike	P	0 - 20
1924613	Cadmium	1.62	Spike	P	0 - 20
1924613	Chromium	0.108	Spike	P	0 - 20
1924613	Copper	0.151	Spike	P	0 - 20
1924613	Lead	0.139	Spike	P	0 - 20
1924613	Nickel	0.230	Spike	P	0 - 20
1924613	Silver	0.507	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330840

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923773	Chloride	0.120	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P330841

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1924248	Chloride	1.56	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923921	Ammonia-N	1.72	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P330868

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923946	Kjeldahl Nitrogen	0.374	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P330852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923913	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P330877

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923921	Total-P	0.615	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330731

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923784	O-Phosphate-P	1.80	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P330812

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923964	O-Phosphate-P	3.15	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P330744

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923906	Color (true)	2.50	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P330816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1924098	Color (true)	0.127	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P330955

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923920	Total Alkalinity	0.292	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P331045

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923775	TDS	0.0	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P330957

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923920	Fluoride	2.41	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P330972

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1923932	Organic Carbon	0.320	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A78584
Included Lab Sample IDs: 1923930, 1923931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.1	98.3	P/P	90 - 110
Chloride	99.4	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A78589
Included Lab Sample IDs: 1923934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.7	97.7	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A78592
Included Lab Sample IDs: 1923930

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	104	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A78608
Included Lab Sample IDs: 1923935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	99.5	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A78609
Included Lab Sample IDs: 1923931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	85 - 115

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A78610
Included Lab Sample IDs: 1923930, 1923931

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A78616
Included Lab Sample IDs: 1923932, 1923933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A78654
Included Lab Sample IDs: 1923932, 1923933

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

Reference Method: SM 2320 B-97
Run ID: A78669
Included Lab Sample IDs: 1923930, 1923931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A78669
Included Lab Sample IDs: 1923930, 1923931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.1	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A78670
Included Lab Sample IDs: 1923932, 1923933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.1	100	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A78672
Included Lab Sample IDs: 1923932, 1923933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.8	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A78686
Included Lab Sample IDs: 1923938, 1923939

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
 Run ID: A78691
 Included Lab Sample IDs: 1923938, 1923939

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	100	101	P/P	90 - 110
Cadmium	98.1	98.8	P/P	90 - 110
Chromium	99.5	100	P/P	90 - 110
Copper	99.3	100	P/P	90 - 110
Lead	99.3	99.8	P/P	90 - 110
Nickel	98.4	98.5	P/P	90 - 110
Silver	96.7	97.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A78720
 Included Lab Sample IDs: 1923932, 1923933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	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								4.53	
EPA 200.7 Rev. 4.4	Iron	107	106	106	105					0.533
	Zinc	102	98.2	97.6	99.9					2.31
EPA 200.8 Rev. 5.4	Arsenic	102	104	105	105					0.0697
	Cadmium	97.3	99.5	99.1	101					1.62
	Chromium	98.0	96.8	97.0	97.1					0.108
	Copper	95.7	92.8	93.8	94.0					0.151
	Lead	97.2	98.4	99.1	99.0					0.139
	Nickel	98.1	95.4	96.6	96.8					0.230
	Silver	103	103	105	105					0.507
EPA 300.0 Rev. 2.1	Chloride	96.7	96.1	90.2					0.120	
	Chloride	95.5	98.1	101					1.56	
EPA 350.1 Rev. 2.0	Ammonia-N	103	101	98.9						1.72
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	91.3	90.9						0.374
EPA 353.2 Rev. 2.0	NO2NO3-N	106	100	100						0.499
EPA 365.1 Rev. 2.0	Total-P	95.2	99.0	99.6						0.615
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	93.7	95.4						1.80
	O-Phosphate-P	97.8	93.7	97.3						3.15
SM 2120 B	Color (true)								2.50	
	Color (true)								0.127	
SM 2320 B-97	Total Alkalinity	103							0.292	
SM 2540 C-97	TDS								0.0	
SM 4500 F-C-97	Fluoride	96.1	98.1	101						2.41
SM 5310 B-00	Organic Carbon	102	105							0.320

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1923930, 1923931
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1923938, 1923939
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1923938, 1923939
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1923930, 1923931
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1923932, 1923933
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1923932, 1923933
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1923932, 1923933
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1923932, 1923933
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1923934, 1923935
SM 2120 B / E31780	True Color measured at 450 nm	1923930, 1923931
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1923930, 1923931
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1923930, 1923931
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1923930, 1923931
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1923930, 1923931
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1923932, 1923933

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	08/23/2017			08/24/2017 16:33	DeAsia Armster	1923930, 1923931
EPA 200.7 Rev. 4.4	08/23/2017	08/28/2017	Elliott D. Healy	08/29/2017	Betina Topolski	1923938, 1923939
EPA 200.8 Rev. 5.4	08/23/2017	08/28/2017	Elliott D. Healy	08/29/2017	Nadine Brooks	1923938, 1923939
EPA 300.0 Rev. 2.1	08/23/2017			08/24/2017	Julia Storbeck	1923930, 1923931
EPA 350.1 Rev. 2.0	08/23/2017			08/29/2017	Sofia Elnemr	1923932, 1923933
EPA 351.2 Rev. 2.0	08/23/2017	08/25/2017	Adrian Shelby	08/29/2017	Joseph Suarez	1923932, 1923933
EPA 353.2 Rev. 2.0	08/23/2017			08/25/2017	Beverly Y. Sanders	1923932, 1923933
EPA 365.1 Rev. 2.0	08/23/2017	08/25/2017	Sima Feizi	08/28/2017	Lipi Saha	1923932, 1923933
EPA 365.1 Rev. 2.0 dissolved	08/23/2017			08/23/2017 17:26	Megan Treadwell	1923934
	08/23/2017			08/24/2017 15:19	Megan Treadwell	1923935
SM 2120 B	08/23/2017			08/23/2017 17:36	Tanya Welborn	1923930
	08/23/2017			08/24/2017 16:45	Tanya Welborn	1923931
SM 2320 B-97	08/23/2017			08/28/2017	Dale L. Simmons	1923930, 1923931
SM 2540 C-97	08/23/2017			08/25/2017	Yijie Li	1923930, 1923931
SM 2540 D-97	08/23/2017			08/25/2017	Yijie Li	1923930, 1923931
SM 4500 F-C-97	08/23/2017			08/28/2017	Dale L. Simmons	1923930, 1923931
SM 5310 B-00	08/23/2017			08/28/2017	Ping Hua	1923932, 1923933