Chemical Analysis Report

WQAP-2016-11-16-05

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

Event Description:	**Moriah Creek, Chicken Branch, Ward Creek and Caney Branch**
Request ID:	**RQ-2016-11-14-39**
Customer:	**WQAP**
Project ID:	**SMP**

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

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

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 13-DEC-2016 11:47

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: CHICKEN BRANCH AT OLD PLANK RD. **Collection Date/Time: 11/16/2016 09:15**

Field ID: G1WA0031-11162016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1850617	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P315324	
	EPA 300.0 Rev. 2.1	Chloride	6.0		mg Cl/L	P315991	
	SM 2120 B	Color (true)	12		PCU	P315364	
	SM 2320 B-97	Total Alkalinity	139		mg CaCO3/L	P315673	
	SM 2540 C-97	TDS	165		mg/L	P315618	
	SM 2540 D-97	TSS	2	I	mg/L	P315629	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P315676	
1850618	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P315682	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.16	I	mg N/L	P316070	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P315749	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P315828	
	SM 5310 B-00	Organic Carbon	2.2		mg C/L	P315383	
1850619	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.030		mg P/L	P315297	

Ref. Method and Comment:
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: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: CANEY CREEK UPSTREAM OF US 90 **Collection Date/Time: 11/16/2016 12:00**

Field ID: G1WA0014-11162016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1850614	EPA 180.1 Rev. 2.0	Turbidity	6.8		NTU	P315324	
	EPA 300.0 Rev. 2.1	Chloride	7.0		mg Cl/L	P315991	
	SM 2120 B	Color (true)	78	A	PCU	P315364	
	SM 2320 B-97	Total Alkalinity	33		mg CaCO3/L	P315424	
	SM 2540 C-97	TDS	65		mg/L	P315618	
	SM 2540 D-97	TSS	5	I	mg/L	P315629	
	SM 4500 F-C-97	Fluoride	0.080	I	mg F/L	P315427	
1850615	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P315682	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.50		mg N/L	P316148	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.33		mg N/L	P315749	
	EPA 365.1 Rev. 2.0	Total-P	0.45		mg P/L	P315828	
	SM 5310 B-00	Organic Carbon	6.5		mg C/L	P315383	
1850616	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.38		mg P/L	P315296	
1850623	EPA 200.7 Rev. 4.4	Calcium	8.75		mg/L	P315524	
		Iron	610		ug/L	P315524	
		Magnesium	3.40		mg/L	P315524	
		Potassium	2.9		mg/L	P315524	
		Sodium	4.8		mg/L	P315524	
		Zinc	5.0	U	ug/L	P315524	
	EPA 200.8 Rev. 5.4	Arsenic	0.49		ug/L	P315524	
		Cadmium	0.020	U	ug/L	P315524	
		Chromium	0.60		ug/L	P315524	
		Copper	0.20	I	ug/L	P315524	

Field ID: G1WA0014-11162016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1850623	EPA 200.8 Rev. 5.4	Lead	0.20		ug/L	P315524	
		Nickel	0.35		ug/L	P315524	
		Silver	0.0050	U	ug/L	P315524	

Ref. Method and Comment:
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: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P315324

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P315524

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: P315524

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315991

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315682

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316070

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316070

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316148

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315749

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315828

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315296

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315297

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

Reference Method: SM 2120 B
Batch ID: P315364

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P315424

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

Reference Method: SM 2320 B-97
Batch ID: P315673

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: P315618

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P315629

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P315427

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P315676

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P315383

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: P315524

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	106		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	101		P	85 - 115
Sodium	103		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P315524

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.7		P	85 - 115
Cadmium	98.7		P	85 - 115
Chromium	98.7		P	85 - 115
Copper	95.2		P	85 - 115
Lead	99.6		P	85 - 115
Nickel	97.2		P	85 - 115
Silver	101		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315991

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315682

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316070

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316148

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315749

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315828

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315296

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315297

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

Reference Method: SM 2320 B-97
Batch ID: P315424

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P315673

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P315427

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

Reference Method: SM 4500 F-C-97
Batch ID: P315676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.3		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P315383

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P315524

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850733	Calcium	102		P	80 - 120
1850733	Iron	105		P	80 - 120
1850733	Magnesium	101		P	80 - 120
1850733	Potassium	98.9		P	80 - 120
1850733	Sodium	101		P	80 - 120
1850733	Zinc	97.6		P	80 - 120
1851401	Calcium	103		P	80 - 120
1851401	Iron	106	105	P/P	80 - 120
1851401	Magnesium	106	107	P/P	80 - 120
1851401	Potassium	100	103	P/P	80 - 120
1851401	Sodium	108	108	P/P	80 - 120
1851401	Zinc	96.1	97.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P315524

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850733	Arsenic	101		P	80 - 120
1850733	Cadmium	100		P	80 - 120
1850733	Chromium	100		P	80 - 120
1850733	Copper	97.5		P	80 - 120
1850733	Lead	102		P	80 - 120
1850733	Nickel	96.3		P	80 - 120
1850733	Silver	101		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P315524

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851401	Arsenic	99.4	99.7	P/P	80 - 120
1851401	Cadmium	101	102	P/P	80 - 120
1851401	Chromium	100	102	P/P	80 - 120
1851401	Copper	91.8	91.9	P/P	80 - 120
1851401	Lead	99.4	101	P/P	80 - 120
1851401	Nickel	94.6	95.2	P/P	80 - 120
1851401	Silver	101	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315991

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848613	Chloride	102		P	90 - 110
1848614	Chloride	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850615	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316070

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851299	Kjeldahl Nitrogen	110	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316148

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851218	Kjeldahl Nitrogen	104	110	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315749

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850563	NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315296

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850503	O-Phosphate-P	99.6	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315297

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850619	O-Phosphate-P	98.1	99.6	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P315427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850501	Fluoride	97.5	97.5	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P315676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851136	Fluoride	100	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P315383

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1849091	Organic Carbon	98.2	97.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P315324

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850543	Turbidity	7.12	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P315524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851401	Calcium	0.947	Spike	P	0 - 20
1851401	Iron	1.19	Spike	P	0 - 20
1851401	Magnesium	0.391	Spike	P	0 - 20
1851401	Potassium	1.74	Spike	P	0 - 20
1851401	Sodium	0.0745	Spike	P	0 - 20
1851401	Zinc	1.44	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P315524

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851401	Arsenic	0.392	Spike	P	0 - 20
1851401	Cadmium	1.11	Spike	P	0 - 20
1851401	Chromium	1.13	Spike	P	0 - 20
1851401	Copper	0.130	Spike	P	0 - 20
1851401	Lead	1.19	Spike	P	0 - 20
1851401	Nickel	0.685	Spike	P	0 - 20
1851401	Silver	0.269	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P315991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848613	Chloride	0.0503	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850615	Ammonia-N	0.628	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316070

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851299	Kjeldahl Nitrogen	2.61	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851218	Kjeldahl Nitrogen	4.52	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850563	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850615	Total-P	0.280	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850503	O-Phosphate-P	0.149	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315297

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850619	O-Phosphate-P	1.17	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P315364

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850614	Color (true)	2.45	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P315424

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850501	Total Alkalinity	0.579	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P315673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851136	Total Alkalinity	0.452	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P315618

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850501	TDS	1.89	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P315427

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850501	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P315676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851136	Fluoride	0.494	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P315383

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1849091	Organic Carbon	0.916	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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A72846
Included Lab Sample IDs: 1850616, 1850619

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110
O-Phosphate-P	100	98.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A72856
Included Lab Sample IDs: 1850614, 1850617

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A72861
Included Lab Sample IDs: 1850614, 1850617

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

Reference Method: SM 5310 B-00
Run ID: A72867
Included Lab Sample IDs: 1850615, 1850618

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

Reference Method: SM 2320 B-97
Run ID: A72887
Included Lab Sample IDs: 1850614

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

Reference Method: SM 4500 F-C-97
Run ID: A72887
Included Lab Sample IDs: 1850614

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

Reference Method: SM 2320 B-97
Run ID: A72982
Included Lab Sample IDs: 1850617

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.9	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A72982
Included Lab Sample IDs: 1850617

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A72986
Included Lab Sample IDs: 1850615, 1850618

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A73006
Included Lab Sample IDs: 1850623

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.4	96.8	P/P	90 - 110
Cadmium	97.4	96.7	P/P	90 - 110
Chromium	97.0	98.9	P/P	90 - 110
Copper	94.7	93.3	P/P	90 - 110
Lead	97.7	96.7	P/P	90 - 110
Nickel	95.9	95.3	P/P	90 - 110
Silver	99.9	98.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A73012
Included Lab Sample IDs: 1850623

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	101	P/P	90 - 110
Iron	102	101	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	101	99.9	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Zinc	103	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A73015
Included Lab Sample IDs: 1850615, 1850618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A73071
Included Lab Sample IDs: 1850615

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A73105
Included Lab Sample IDs: 1850614, 1850617

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A73108
Included Lab Sample IDs: 1850618

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.2	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A73185
Included Lab Sample IDs: 1850618

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A73208
Included Lab Sample IDs: 1850615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.2	97.5	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		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						7.12	
EPA 200.7 Rev. 4.4	Calcium	106	102	103				0.947
	Iron	106	105	106	105			1.19
	Magnesium	108	101	106	107			0.391
	Potassium	101	98.9	100	103			1.74
	Sodium	103	101	108	108			0.0745
	Zinc	100	97.6	96.1	97.7			1.44
EPA 200.8 Rev. 5.4	Arsenic	98.7	101	99.4	99.7			0.392
	Cadmium	98.7	100	101	102			1.11
	Chromium	98.7	100	100	102			1.13
	Copper	95.2	97.5	91.8	91.9			0.130
	Lead	99.6	102	99.4	101			1.19
	Nickel	97.2	96.3	94.6	95.2			0.685
	Silver	101	101	101	101			0.269
EPA 300.0 Rev. 2.1	Chloride	101	102	100			0.0503	
EPA 350.1 Rev. 2.0	Ammonia-N	102	104	104				0.628
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	110	106				2.61
	Kjeldahl Nitrogen	110	104	110				4.52
EPA 353.2 Rev. 2.0	NO2NO3-N	104	99.0	99.0				0.0
EPA 365.1 Rev. 2.0	Total-P	102						0.280
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	105	99.6	99.8				0.149
	O-Phosphate-P	103	98.1	99.6				1.17
SM 2120 B	Color (true)						2.45	
SM 2320 B-97	Total Alkalinity	102					0.579	
	Total Alkalinity	102					0.452	

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
SM 2540 C-97	TDS					1.89	
SM 4500 F-C-97	Fluoride	96.1	97.5	97.5			0.0
	Fluoride	97.3	100	101			0.494
SM 5310 B-00	Organic Carbon	99.0	98.2	97.2			0.916

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1850614, 1850617
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1850623
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1850623
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1850614, 1850617
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1850615, 1850618
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1850615, 1850618
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1850615, 1850618
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1850615, 1850618
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1850616, 1850619
SM 2120 B / E31780	True Color measured at 450 nm	1850614, 1850617
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1850614, 1850617
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1850614, 1850617
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1850614, 1850617
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1850614, 1850617
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1850615, 1850618

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	11/16/2016			11/16/2016 16:20	Sima Feizi	1850614, 1850617
EPA 200.7 Rev. 4.4	11/16/2016	11/21/2016	Elliott D. Healy	11/22/2016	Joshua Ayres	1850623
EPA 200.8 Rev. 5.4	11/16/2016	11/21/2016	Elliott D. Healy	11/23/2016	Charles J. Peterson	1850623
EPA 300.0 Rev. 2.1	11/16/2016			12/01/2016	Ping Hua	1850614, 1850617
EPA 350.1 Rev. 2.0	11/16/2016			11/22/2016	Sofia Elnemr	1850615, 1850618
EPA 351.2 Rev. 2.0	11/16/2016	12/02/2016	Martin Acosta	12/06/2016	Christopher Armour	1850618
	11/16/2016	12/05/2016	Martin Acosta	12/06/2016	Joseph Suarez	1850615
EPA 353.2 Rev. 2.0	11/16/2016			11/28/2016	Beverly Y. Sanders	1850615, 1850618
EPA 365.1 Rev. 2.0	11/16/2016	11/29/2016	Christopher Armour	11/29/2016	Lipi Saha	1850615
	11/16/2016	11/29/2016	Christopher Armour	11/30/2016	Lipi Saha	1850618
EPA 365.1 Rev. 2.0 dissolved	11/16/2016			11/16/2016 15:13	Julia Storbeck	1850619
	11/16/2016			11/16/2016 16:15	Julia Storbeck	1850616
SM 2120 B	11/16/2016			11/16/2016 16:59	Blanca Fach	1850614
	11/16/2016			11/16/2016 17:00	Blanca Fach	1850617
SM 2320 B-97	11/16/2016			11/18/2016	Dale L. Simmons	1850614
	11/16/2016			11/23/2016	Dale L. Simmons	1850617
SM 2540 C-97	11/16/2016			11/18/2016	Yijie Li	1850614, 1850617
SM 2540 D-97	11/16/2016			11/18/2016	Yijie Li	1850614, 1850617
SM 4500 F-C-97	11/16/2016			11/18/2016	Dale L. Simmons	1850614
	11/16/2016			11/23/2016	Dale L. Simmons	1850617
SM 5310 B-00	11/16/2016			11/17/2016	Julie Michelle Frank	1850615, 1850618