Chemical Analysis Report

WQAP-2017-06-27-05

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

Event Description: **pesticide template kit: C**
Request ID: **RQ-2017-03-27-41**
Customer: **WQAP**
Project ID: **SMP**

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

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 21-JUL-2017 11:22

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: 06/27/2017 10:00**

Field ID: G1TLHR0019-2017-02 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1909357	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P327595	
	EPA 300.0 Rev. 2.1	Chloride	4.1		mg Cl/L	P327935	
		Sulfate	0.48	I	mg SO4/L	P327938	
	SM 2120 B	Color (true)	480		PCU	P327649	
	SM 2320 B-97	Total Alkalinity	21		mg CaCO3/L	P327907	
	SM 2540 C-97	TDS	118		mg/L	P328010	
	SM 2540 D-97	TSS	2	I	mg/L	P328280	
	SM 4500 F-C-97	Fluoride	0.054	I	mg F/L	P327912	
1909359	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P327681	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P327757	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.048		mg N/L	P327700	
	EPA 365.1 Rev. 2.0	Total-P	0.078		mg P/L	P327792	
	SM 5310 B-00	Organic Carbon	38		mg C/L	P327761	
1909361	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.052		mg P/L	P327641	
1909365	EPA 200.7 Rev. 4.4	Calcium	10.5		mg/L	P327642	
		Iron	1.23E+03		ug/L	P327642	
		Magnesium	2.22		mg/L	P327642	
		Potassium	0.63	I	mg/L	P327642	
		Sodium	2.6		mg/L	P327642	
		Zinc	5.0	U	ug/L	P327642	
	EPA 200.8 Rev. 5.4	Arsenic	0.50		ug/L	P327642	
		Cadmium	0.020	U	ug/L	P327642	
		Chromium	0.65	I	ug/L	P327642	
		Copper	0.27	I	ug/L	P327642	
		Lead	0.26		ug/L	P327642	
		Nickel	0.69	I	ug/L	P327642	
		Silver	0.010	U	ug/L	P327642	

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: 06/27/2017 12:30**

Field ID: G1TLHR0065-2017-03 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1909358	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P327595	
	EPA 300.0 Rev. 2.1	Chloride	4.7		mg Cl/L	P327935	
		Sulfate	0.78		mg SO4/L	P327938	
	SM 2120 B	Color (true)	530		PCU	P327649	
	SM 2320 B-97	Total Alkalinity	72		mg CaCO3/L	P327907	
	SM 2540 C-97	TDS	167		mg/L	P328010	
	SM 2540 D-97	TSS	4	I	mg/L	P328280	
	SM 4500 F-C-97	Fluoride	0.096	I	mg F/L	P327912	
1909360	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P327681	

Field ID: G1TLHR0065-2017-03 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1909360	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P327757	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P327700	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P327792	
	SM 5310 B-00	Organic Carbon	41		mg C/L	P327761	
1909362	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.13		mg P/L	P327641	
1909366	EPA 200.7 Rev. 4.4	Calcium	31.9		mg/L	P327642	
		Iron	1.00E+03		ug/L	P327642	
		Magnesium	3.41		mg/L	P327642	
		Potassium	0.30	U	mg/L	P327642	
		Sodium	3.1		mg/L	P327642	
		Zinc	5.0	U	ug/L	P327642	
	EPA 200.8 Rev. 5.4	Arsenic	0.41		ug/L	P327642	
		Cadmium	0.020	U	ug/L	P327642	
		Chromium	0.56	I	ug/L	P327642	
		Copper	0.21	I	ug/L	P327642	
		Lead	0.16	I	ug/L	P327642	
		Nickel	0.38	I	ug/L	P327642	
		Silver	0.010	U	ug/L	P327642	

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: P327595

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327642

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: P327642

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327642

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327935

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327938

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P327681

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327757

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327700

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327792

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P327641

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

Reference Method: SM 2120 B
Batch ID: P327649

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P327907

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

Reference Method: SM 2540 C-97
Batch ID: P328010

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P328280

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P327912

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P327761

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: P327642

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	105		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	98.2		P	85 - 115
Sodium	101		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327642

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	103		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	94.2		P	85 - 115
Copper	98.8		P	85 - 115
Lead	98.5		P	85 - 115
Nickel	99.6		P	85 - 115
Silver	99.5		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327935

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327938

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P327681

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	109		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327757

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327700

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: P327792

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	93.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P327641

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

Reference Method: SM 2320 B-97
Batch ID: P327907

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

Reference Method: SM 4500 F-C-97
Batch ID: P327912

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.3		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P327761

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908944	Calcium	103		P	80 - 120
1908944	Iron	104		P	80 - 120
1908944	Magnesium	106		P	80 - 120
1908944	Potassium	97.8		P	80 - 120
1908944	Sodium	99.9		P	80 - 120
1908944	Zinc	101		P	80 - 120
1909314	Calcium	101		P	80 - 120
1909314	Iron	105	107	P/P	80 - 120
1909314	Magnesium	103		P	80 - 120
1909314	Potassium	96.7	97.8	P/P	80 - 120
1909314	Sodium	98.7	95.9	P/P	80 - 120
1909314	Zinc	99.8	98.5	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1908944	Arsenic	104		P	80 - 120
1908944	Cadmium	102		P	80 - 120
1908944	Chromium	96.7		P	80 - 120
1908944	Copper	100		P	80 - 120
1908944	Lead	100		P	80 - 120
1908944	Nickel	102		P	80 - 120
1908944	Silver	101		P	80 - 120
1909314	Arsenic	102	102	P/P	80 - 120
1909314	Cadmium	103	101	P/P	80 - 120
1909314	Chromium	95.8	94.6	P/P	80 - 120
1909314	Copper	96.8	96.8	P/P	80 - 120
1909314	Lead	97.1	98.5	P/P	80 - 120
1909314	Nickel	97.4	97.2	P/P	80 - 120
1909314	Silver	99.0	99.0	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909244	Chloride	102		P	90 - 110
1909265	Chloride	103		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327938

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909244	Sulfate	102		P	90 - 110
1909265	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P327681

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909359	Ammonia-N	99.1	96.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909371	Kjeldahl Nitrogen	96.3	90.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327700

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909272	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327792

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909272	Total-P	102	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P327641

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909373	O-Phosphate-P	93.4	95.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P327912

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909653	Fluoride	97.8	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P327761

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909072	Organic Carbon	98.6	100	P/P	85 - 115

Quality Assurance Report
Precision

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P327595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909347	Turbidity	9.32	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909314	Calcium	0.815	Spike	P	0 - 20
1909314	Iron	1.67	Spike	P	0 - 20
1909314	Magnesium	1.21	Spike	P	0 - 20
1909314	Potassium	0.751	Spike	P	0 - 20
1909314	Sodium	1.48	Spike	P	0 - 20
1909314	Zinc	1.35	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909314	Arsenic	0.0757	Spike	P	0 - 20
1909314	Cadmium	1.94	Spike	P	0 - 20
1909314	Chromium	1.31	Spike	P	0 - 20
1909314	Copper	0.0357	Spike	P	0 - 20
1909314	Lead	1.38	Spike	P	0 - 20
1909314	Nickel	0.140	Spike	P	0 - 20
1909314	Silver	0.00573	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909244	Chloride	3.56	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327938

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909244	Sulfate	5.01	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P327681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909359	Ammonia-N	1.90	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909371	Kjeldahl Nitrogen	5.01	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909272	NO2NO3-N	1.48	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909272	Total-P	3.47	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P327641

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909373	O-Phosphate-P	1.25	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P327649

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909352	Color (true)	1.30	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P327907

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909653	Total Alkalinity	0.0527	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P328010

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909352	TDS	2.79	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P327912

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909653	Fluoride	2.39	Spike	P	0 - 3.0

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P327761

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909072	Organic Carbon	1.12	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: A77382
Included Lab Sample IDs: 1909357, 1909358

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A77396
Included Lab Sample IDs: 1909361, 1909362

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.3	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A77400
Included Lab Sample IDs: 1909357, 1909358

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	99.9	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A77410
Included Lab Sample IDs: 1909359, 1909360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	95.5	96.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A77418
Included Lab Sample IDs: 1909359, 1909360

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

Reference Method: SM 5310 B-00
Run ID: A77437
Included Lab Sample IDs: 1909359, 1909360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.9	95.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A77442
Included Lab Sample IDs: 1909365, 1909366

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	100	P/P	90 - 110
Iron	102	101	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	98.7	97.7	P/P	90 - 110
Sodium	97.4	96.9	P/P	90 - 110
Zinc	99.8	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A77490
Included Lab Sample IDs: 1909359, 1909360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	109	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A77508
Included Lab Sample IDs: 1909357, 1909358

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A77508
Included Lab Sample IDs: 1909357, 1909358

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A77520
Included Lab Sample IDs: 1909359, 1909360

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A77522
Included Lab Sample IDs: 1909357, 1909358

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	95.1	95.4	P/P	90 - 110
Chloride	95.4	94.7	P/P	90 - 110
Sulfate	98.2	99.3	P/P	90 - 110
Sulfate	99.3	98.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77530
Included Lab Sample IDs: 1909365, 1909366

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	99.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77530
Included Lab Sample IDs: 1909365, 1909366

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	98.5	99.5	P/P	90 - 110
Chromium	93.4	95.9	P/P	90 - 110
Copper	99.5	98.2	P/P	90 - 110
Lead	96.2	96.1	P/P	90 - 110
Nickel	98.4	98.1	P/P	90 - 110
Silver	96.1	95.5	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						9.32	
EPA 200.7 Rev. 4.4	Calcium	105	103	101				0.815
	Iron	105	104	105	107			1.67
	Magnesium	106	106	103				1.21
	Potassium	98.2	97.8	96.7	97.8			0.751
	Sodium	101	99.9	98.7	95.9			1.48
	Zinc	101	101	99.8	98.5			1.35
EPA 200.8 Rev. 5.4	Arsenic	103	104	102	102			0.0757
	Cadmium	101	102	103	101			1.94
	Chromium	94.2	96.7	95.8	94.6			1.31
	Copper	98.8	100	96.8	96.8			0.0357
	Lead	98.5	100	97.1	98.5			1.38
	Nickel	99.6	102	97.4	97.2			0.140
	Silver	99.5	101	99.0	99.0			0.0057
EPA 300.0 Rev. 2.1	Chloride	99.2	102	103			3.56	
	Sulfate	101	102	101			5.01	
EPA 350.1 Rev. 2.0	Ammonia-N	109	99.1	96.5				1.90
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	96.3	90.7				5.01
EPA 353.2 Rev. 2.0	NO2NO3-N	104	100	102				1.48
EPA 365.1 Rev. 2.0	Total-P	93.1	102	98.0				3.47
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	93.4	95.1				1.25
SM 2120 B	Color (true)						1.30	
SM 2320 B-97	Total Alkalinity	103					0.0527	
SM 2540 C-97	TDS						2.79	
SM 4500 F-C-97	Fluoride	96.3	97.8	101				2.39
SM 5310 B-00	Organic Carbon	97.8	98.6	100				1.12

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1909357, 1909358
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1909365, 1909366

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1909365, 1909366
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1909357, 1909358
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1909357, 1909358
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1909359, 1909360
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1909359, 1909360
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1909359, 1909360
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1909359, 1909360
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1909361, 1909362
SM 2120 B / E31780	True Color measured at 450 nm	1909357, 1909358
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1909357, 1909358
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1909357, 1909358
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1909357, 1909358
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1909357, 1909358
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1909359, 1909360

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	06/27/2017			06/27/2017 17:22	DeAsia Armster	1909357, 1909358
EPA 200.7 Rev. 4.4	06/27/2017	06/28/2017	Elliott D. Healy	06/29/2017	Betina Topolski	1909365, 1909366
EPA 200.8 Rev. 5.4	06/27/2017	06/28/2017	Elliott D. Healy	07/05/2017	Nadine Brooks	1909365, 1909366
EPA 300.0 Rev. 2.1	06/27/2017			06/30/2017	Julia Storbeck	1909357, 1909358
EPA 350.1 Rev. 2.0	06/27/2017			06/28/2017	Sofia Elnemr	1909359, 1909360
EPA 351.2 Rev. 2.0	06/27/2017	06/30/2017	Adrian Shelby	07/03/2017	Joseph Suarez	1909359, 1909360
EPA 353.2 Rev. 2.0	06/27/2017			06/29/2017	Beverly Y. Sanders	1909359, 1909360
EPA 365.1 Rev. 2.0	06/27/2017	06/30/2017	Vijayalakshmi Reddy	07/05/2017	Lipi Saha	1909359, 1909360
EPA 365.1 Rev. 2.0 dissolved	06/27/2017			06/28/2017 12:13	Lipi Saha	1909361
	06/27/2017			06/28/2017 12:14	Lipi Saha	1909362
SM 2120 B	06/27/2017			06/28/2017 16:31	Tanya Welborn	1909357
	06/27/2017			06/28/2017 16:32	Tanya Welborn	1909358
SM 2320 B-97	06/27/2017			07/01/2017	Dale L. Simmons	1909357, 1909358
SM 2540 C-97	06/27/2017			06/30/2017	Yijie Li	1909357, 1909358
SM 2540 D-97	06/27/2017			06/30/2017	Yijie Li	1909357, 1909358
SM 4500 F-C-97	06/27/2017			07/01/2017	Dale L. Simmons	1909357, 1909358
SM 5310 B-00	06/27/2017			06/29/2017	Sofia Elnemr	1909359, 1909360