

Chemical Analysis Report

WQAP-2016-01-26-01

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

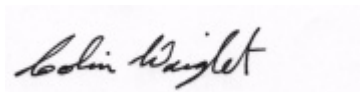
Event Description: **Caney Creek, Ward Creek and Lake Lafayette Drain**
Request ID: **RQ-2016-01-25-58**
Customer: **WQAP**
Project ID: **SMP**

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
Timothy W. Fitzpatrick
Liang-Tsair Lin, Ph.D.
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Certified by: Colin Wright, Environmental Administrator

Date Certified: 15-FEB-2016 11:57



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: Lake Lafayette Drain 250 Meters Downstream of Weems Rd. **Collection Date/Time: 01/26/2016 08:45**

Field ID: G1WA0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1765503	EPA 180.1 Rev. 2.0	Turbidity	2.5	A	NTU	P297690	
	EPA 300.0 Rev. 2.1	Chloride	4.7		mg Cl/L	P297771	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.004	I	mg N/L	P297636	
	SM 2120 B	Color (true)	3.2	I	PCU	P297661	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P298142	
	SM 2540 C-97	TDS	55		mg/L	P298282	
	SM 2540 D-97	TSS	4	I	mg/L	P298119	
	SM 4500 F-C-97	Fluoride	0.038	I	mg F/L	P297746	
1765506	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P297991	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.12	I	mg N/L	P297738	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.061		mg N/L	P297868	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P297764	
	SM 5310 B-00	Organic Carbon	1.7		mg C/L	P297845	
1765509	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P297568	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: Ward Creek Upstream of Bridge @CR 259 **Collection Date/Time: 01/26/2016 13:00**

Field ID: G1WA0002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1765505	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P297690	
	EPA 300.0 Rev. 2.1	Chloride	4.2		mg Cl/L	P297771	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	U	mg N/L	P297636	
	SM 2120 B	Color (true)	130		PCU	P297661	
	SM 2320 B-97	Total Alkalinity	8.4		mg CaCO3/L	P298142	
	SM 2540 C-97	TDS	57		mg/L	P298282	
	SM 2540 D-97	TSS	2	U	mg/L	P298119	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P297747	
1765508	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P297991	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P297738	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P297868	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P297765	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P297845	
1765511	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P297568	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: Caney Creek Upstream of US 90 **Collection Date/Time: 01/26/2016 09:45**

Field ID: G1WA0014

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1765512	EPA 180.1 Rev. 2.0	Turbidity	14		NTU	P297690	
	EPA 300.0 Rev. 2.1	Chloride	6.9		mg Cl/L	P297771	

Field ID: G1WA0014

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1765512	EPA 353.2 Rev. 2.0	Nitrite-N	0.012		mg N/L	P297636	
	SM 2120 B	Color (true)	50		PCU	P297661	
	SM 2320 B-97	Total Alkalinity	20		mg CaCO3/L	P298142	
	SM 2540 C-97	TDS	61		mg/L	P298282	
	SM 2540 D-97	TSS	8	I	mg/L	P298119	
	SM 4500 F-C-97	Fluoride	0.074	I	mg F/L	P297747	
1765513	EPA 350.1 Rev. 2.0	Ammonia-N	0.066		mg N/L	P297991	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.55		mg N/L	P297738	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.29		mg N/L	P297868	
	EPA 365.1 Rev. 2.0	Total-P	0.36		mg P/L	P297765	
	SM 5310 B-00	Organic Carbon	6.2		mg C/L	P297846	
1765514	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.23		mg P/L	P297568	
1765523	EPA 200.7 Rev. 4.4	Calcium	6.44		mg/L	P297639	
		Iron	780		ug/L	P297639	
		Magnesium	2.24		mg/L	P297639	
		Potassium	2.8		mg/L	P297639	
		Sodium	4.9		mg/L	P297639	
		Zinc	5.0	U	ug/L	P297639	
	EPA 200.8 Rev. 5.4	Arsenic	0.41		ug/L	P297639	
		Cadmium	0.020	U	ug/L	P297639	
		Chromium	1.05		ug/L	P297639	
		Copper	0.55		ug/L	P297639	
		Lead	0.38		ug/L	P297639	
		Nickel	0.34		ug/L	P297639	
		Silver	0.0050	U	ug/L	P297639	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Non-Conformance Report

NCR ID: 5672

<u>Event(s)</u>	<u>Job(s)</u>	<u>Sample(s)</u>	<u>Test(s)</u>
WQAP-2016-01-26-01			
NCR Type:	SHIPPING/RECEIVING	NCR Category:	Receiving
Observation:	(1) Sample submittal forms indicated bottle group A was collected at 3 sites. Containers received account for bottle group A being collected at 2 sites, with the 3rd site having containers for bottle group B & C.		
	(2) Stray tally mark observed on sample submittal form under bottle group B by the chlorophyll analysis that makes it appear like more containers were shipped than received.		
Resolution:	(1) Field IDs: G1WA0007 & G1WA002, were logged in for bottle group A. Field ID G1WA0014 was logged in for bottle groups B & C.		
	(2) Excluding the stray tally mark, 18 containers are indicated on the sample submittal form and 18 containers were received.		

Authorised by/Date: Kathryn Holland 2/5/2016

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

Chemistry Tim Fitzpatrick (850) 245-8085
Biology Lori Wolfe (850) 245-8177

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P297690

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P297639

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: P297639

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: P297771

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297991

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297738

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297636

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297636

Component	Result	Code	Units
Nitrite-N	0.003	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297868

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297764

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297765

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297568

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

Reference Method: SM 2120 B
Batch ID: P297661

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P298142

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

Reference Method: SM 2540 C-97
Batch ID: P298282

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P298119

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P297746

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P297747

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P297845

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-00
Batch ID: P297846

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: P297639

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	101		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	106		P	85 - 115
Sodium	105		P	85 - 115
Zinc	98.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P297639

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115
Cadmium	95.0		P	85 - 115
Chromium	94.4		P	85 - 115
Copper	95.1		P	85 - 115
Lead	89.7		P	85 - 115
Nickel	98.4		P	85 - 115
Silver	97.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297771

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297991

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297738

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297636

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Nitrite-N	95.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297868

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297764

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297765

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: P297568

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

Reference Method: SM 2320 B-97
Batch ID: P298142

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.7		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P297746

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.6		P	94 - 108

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P297747

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P297845

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.0		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P297846

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	106		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P297639

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765277	Calcium	103		P	80 - 120
1765277	Iron	103	102	P/P	80 - 120
1765277	Magnesium	103		P	80 - 120
1765277	Potassium	108	108	P/P	80 - 120
1765277	Sodium	107		P	80 - 120
1765277	Zinc	99.2	97.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P297639

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765277	Arsenic	103	101	P/P	80 - 120
1765277	Cadmium	99.5	102	P/P	80 - 120
1765277	Chromium	96.8	96.4	P/P	80 - 120
1765277	Copper	107	100	P/P	80 - 120
1765277	Lead	91.5	90.6	P/P	80 - 120
1765277	Nickel	97.9	96.2	P/P	80 - 120
1765277	Silver	101	99.5	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297771

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765503	Chloride	102	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297991

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765569	Ammonia-N	97.4	97.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765407	Kjeldahl Nitrogen	99.3	95.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297636

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765503	Nitrite-N	95.6	95.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297868

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765568	NO2NO3-N	98.1	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297764

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765364	Total-P	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297765

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765508	Total-P	105	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297568

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765509	O-Phosphate-P	103	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P297746

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765543	Fluoride	99.0	100	P/P	94 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P297747

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765585	Fluoride	97.0	97.0	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P297845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765266	Organic Carbon	91.4	90.8	P/P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P297846

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765513	Organic Carbon	93.1	93.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P297690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765503	Turbidity	1.19	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P297639

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765277	Calcium	0.954	Spike	P	0 - 20
1765277	Iron	1.06	Spike	P	0 - 20
1765277	Magnesium	0.315	Spike	P	0 - 20
1765277	Potassium	0.382	Spike	P	0 - 20
1765277	Sodium	1.79	Spike	P	0 - 20
1765277	Zinc	1.48	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P297639

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765277	Arsenic	2.15	Spike	P	0 - 20
1765277	Cadmium	2.18	Spike	P	0 - 20
1765277	Chromium	0.464	Spike	P	0 - 20
1765277	Copper	6.31	Spike	P	0 - 20
1765277	Lead	0.936	Spike	P	0 - 20
1765277	Nickel	1.73	Spike	P	0 - 20
1765277	Silver	1.22	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P297771

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765503	Chloride	0.941	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P297991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765569	Ammonia-N	0.404	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765407	Kjeldahl Nitrogen	3.79	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765503	Nitrite-N	0.164	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297868

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765568	NO2NO3-N	1.13	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765364	Total-P	1.95	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297765

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765508	Total-P	2.22	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765509	O-Phosphate-P	0.0970	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P297661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765544	Color (true)	0.326	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P298142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765325	Total Alkalinity	1.17	Sample	P	0 - 4.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P298282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765664	TDS	5.41	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P297746

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765543	Fluoride	1.01	Spike	P	0 - 3.7

Reference Method: SM 4500 F-C-97
Batch ID: P297747

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765585	Fluoride	0.0	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P297845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765266	Organic Carbon	0.639	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P297846

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765513	Organic Carbon	0.0403	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 365.1 Rev. 2.0 dissolved
Run ID: A67272
Included Lab Sample IDs: 1765509, 1765511, 1765514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	98.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A67286
Included Lab Sample IDs: 1765503, 1765505, 1765512

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A67299

Included Lab Sample IDs: 1765503, 1765505, 1765512

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nitrite-N	99.5	107	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A67310

Included Lab Sample IDs: 1765503, 1765505, 1765512

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	102	P/P	85 - 115
Color (true)	103	103	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A67317

Included Lab Sample IDs: 1765503, 1765505, 1765512

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

Reference Method: SM 4500 F-C-97

Run ID: A67337

Included Lab Sample IDs: 1765503, 1765505, 1765512

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A67362

Included Lab Sample IDs: 1765513

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A67363

Included Lab Sample IDs: 1765523

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	102	P/P	90 - 110
Iron	100	99.6	P/P	90 - 110
Magnesium	100	100	P/P	90 - 110
Potassium	102	102	P/P	90 - 110
Sodium	105	106	P/P	90 - 110
Zinc	100	102	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A67371

Included Lab Sample IDs: 1765506, 1765508, 1765513

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.2	93.2	P/P	90 - 110
Organic Carbon	93.2	93.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A67374

Included Lab Sample IDs: 1765506, 1765508, 1765513

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A67378

Included Lab Sample IDs: 1765506, 1765508

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	96.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A67381

Included Lab Sample IDs: 1765506, 1765508, 1765513

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A67396

Included Lab Sample IDs: 1765523

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	102	P/P	90 - 110
Cadmium	99.8	100	P/P	90 - 110
Chromium	97.2	98.3	P/P	90 - 110
Copper	99.6	99.6	P/P	90 - 110
Lead	94.4	94.8	P/P	90 - 110
Nickel	99.0	99.6	P/P	90 - 110
Silver	98.4	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A67424

Included Lab Sample IDs: 1765506, 1765508, 1765513

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	99.1	P/P	90 - 110
Ammonia-N	99.1	100	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A67470

Included Lab Sample IDs: 1765503, 1765505, 1765512

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.0	98.9	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				1.19	
EPA 200.7 Rev. 4.4	Calcium	104	103			0.954
	Iron	101	103	102		1.06
	Magnesium	102	103			0.315
	Potassium	106	108	108		0.382
	Sodium	105	107			1.79
	Zinc	98.9	99.2	97.8		1.48
EPA 200.8 Rev. 5.4	Arsenic	101	103	101		2.15
	Cadmium	95.0	99.5	102		2.18
	Chromium	94.4	96.8	96.4		0.464
	Copper	95.1	107	100		6.31
	Lead	89.7	91.5	90.6		0.936
	Nickel	98.4	97.9	96.2		1.73
	Silver	97.9	101	99.5		1.22
EPA 300.0 Rev. 2.1	Chloride	100	102	103		0.941
EPA 350.1 Rev. 2.0	Ammonia-N	97.7	97.4	97.0		0.404
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.1	99.3	95.3		3.79
EPA 353.2 Rev. 2.0	Nitrite-N	95.8	95.6	95.8		0.164
	NO2NO3-N	99.0	98.1	99.6		1.13
EPA 365.1 Rev. 2.0	Total-P	101	104	102		1.95
	Total-P	102	105	103		2.22
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	103	103		0.0970
SM 2120 B	Color (true)				0.326	
SM 2320 B-97	Total Alkalinity	99.7			1.17	
SM 2540 C-97	TDS				5.41	
SM 4500 F-C-97	Fluoride	96.6	99.0	100		1.01
	Fluoride	97.1	97.0	97.0		0.0
SM 5310 B-00	Organic Carbon	94.0	91.4	90.8		0.639
	Organic Carbon	106	93.1	93.1		0.0403

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1765503, 1765505, 1765512
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1765523
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1765523
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1765503, 1765505, 1765512
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1765506, 1765508, 1765513
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1765506, 1765508, 1765513
EPA 353.2 Rev. 2.0 / E31780	Nitrite in aqueous matrices as mg N/L	1765503, 1765505, 1765512
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1765506, 1765508, 1765513
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1765506, 1765508, 1765513
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1765509, 1765511, 1765514
SM 2120 B / E31780	True Color measured at 450 nm	1765503, 1765505, 1765512
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1765503, 1765505, 1765512

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1765503, 1765505, 1765512
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1765503, 1765505, 1765512
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1765503, 1765505, 1765512
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1765506, 1765508, 1765513

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	01/26/2016			01/27/2016 17:25	Sima Feizi	1765503, 1765505, 1765512
EPA 200.7 Rev. 4.4	01/26/2016	01/27/2016	Elliott D. Healy	01/29/2016	Joshua Ayres	1765523
EPA 200.8 Rev. 5.4	01/26/2016	01/27/2016	Elliott D. Healy	02/02/2016	Charles J. Peterson	1765523
EPA 300.0 Rev. 2.1	01/26/2016			01/28/2016	Ping Hua	1765503, 1765505, 1765512
EPA 350.1 Rev. 2.0	01/26/2016			02/03/2016	Diana M. Turner	1765506, 1765508, 1765513
EPA 351.2 Rev. 2.0	01/26/2016	01/29/2016	Christopher Armour	02/01/2016	Bryan A. Werth	1765506, 1765508, 1765513
EPA 353.2 Rev. 2.0	01/26/2016			01/27/2016 13:31	Virginia P. Brown	1765503
	01/26/2016			01/27/2016 13:34	Virginia P. Brown	1765505
	01/26/2016			01/27/2016 13:36	Virginia P. Brown	1765512
	01/26/2016			02/01/2016	Diana M. Turner	1765506, 1765508, 1765513
EPA 365.1 Rev. 2.0	01/26/2016	01/29/2016	Christopher Armour	01/29/2016	Lipi Saha	1765513
	01/26/2016	01/29/2016	Christopher Armour	02/01/2016	Lipi Saha	1765506, 1765508
EPA 365.1 Rev. 2.0 dissolved	01/26/2016			01/26/2016 16:27	Julia Storbeck	1765509
	01/26/2016			01/26/2016 16:30	Julia Storbeck	1765511, 1765514
SM 2120 B	01/26/2016			01/27/2016 14:15	Blanca Fach	1765503
	01/26/2016			01/27/2016 14:17	Blanca Fach	1765512
	01/26/2016			01/27/2016 15:10	Blanca Fach	1765505
SM 2320 B-97	01/26/2016			02/02/2016	Dale L. Simmons	1765503, 1765505, 1765512
SM 2540 C-97	01/26/2016			01/29/2016	Yijie Li	1765503, 1765505, 1765512
SM 2540 D-97	01/26/2016			01/29/2016	Yijie Li	1765503, 1765505, 1765512
SM 4500 F-C-97	01/26/2016			01/28/2016	Dale L. Simmons	1765503, 1765505, 1765512
SM 5310 B-00	01/26/2016			01/29/2016	Sofia Elnemr	1765506, 1765508
	01/26/2016			01/30/2016	Sofia Elnemr	1765513