

Chemical Analysis Report

SE-DIST-2016-03-08-01

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

Event Description: **SMP_2016 Kissimmee**

Request ID: **RQ-2016-02-29-43**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

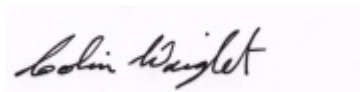
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Jordan Skaggs

For additional information please contact

Timothy W. Fitzpatrick
Liang-Tsair Lin, Ph.D.
Colin Wright, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Environmental Administrator

Date Certified: 25-MAR-2016 10:38

A handwritten signature in black ink, appearing to read "Colin Wright", is written on a light-colored rectangular 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: Kiss River @ 550m Upstream of lock

Collection Date/Time: 03/07/2016 10:45

Field ID: G4SE0081_03072016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1777547	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P299949	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P300102	
		Sulfate	6.9		mg SO4/L	P300105	
		Color (true)	88	A	PCU	P299987	
	SM 2320 B-97	Total Alkalinity	28		mg CaCO3/L	P300452	
	SM 2540 C-97	TDS	101		mg/L	P300416	
	SM 2540 D-97	TSS	5	I	mg/L	P300127	
	SM 4500 F-C-97	Fluoride	0.086	I	mg F/L	P300456	
1777551	EPA 350.1 Rev. 2.0	Ammonia-N	0.043		mg N/L	P300472	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P300346	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P300301	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P300404	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P300236	
1777555	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P299956	
1777590	EPA 200.7 Rev. 4.4	Calcium	11.2		mg/L	P300163	
		Iron	230		ug/L	P300163	
		Magnesium	3.01		mg/L	P300163	
		Potassium	2.6		mg/L	P300163	
		Sodium	10.8		mg/L	P300163	
		Zinc	5.0	U	ug/L	P300163	
	EPA 200.8 Rev. 5.4	Arsenic	0.53		ug/L	P300163	
		Cadmium	0.020	U	ug/L	P300163	
		Chromium	0.22		ug/L	P300163	
		Copper	0.34	I	ug/L	P300163	
		Lead	0.15	I	ug/L	P300163	
		Nickel	0.18	I	ug/L	P300163	
		Silver	0.0050	U	ug/L	P300163	

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: Kiss River @ 825m Upstream of lock

Collection Date/Time: 03/07/2016 11:05

Field ID: G4SE0082_03072016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1777548	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P299949	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P300102	
		Sulfate	6.9		mg SO4/L	P300105	
		Color (true)	87		PCU	P299987	
	SM 2320 B-97	Total Alkalinity	28		mg CaCO3/L	P300452	
	SM 2540 C-97	TDS	101		mg/L	P300416	
	SM 2540 D-97	TSS	5	I	mg/L	P300127	
	SM 4500 F-C-97	Fluoride	0.085	I	mg F/L	P300456	
1777552	EPA 350.1 Rev. 2.0	Ammonia-N	0.039		mg N/L	P300472	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P300346	

Field ID: G4SE0082_03072016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1777552	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P300301	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P300404	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P300236	
1777556	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P299956	
1777591	EPA 200.7 Rev. 4.4	Calcium	11.0		mg/L	P300163	
		Iron	210		ug/L	P300163	
		Magnesium	2.89		mg/L	P300163	
		Potassium	2.5		mg/L	P300163	
		Sodium	10.5		mg/L	P300163	
		Zinc	5.0	U	ug/L	P300163	
	EPA 200.8 Rev. 5.4	Arsenic	0.54		ug/L	P300163	
		Cadmium	0.020	U	ug/L	P300163	
		Chromium	0.23		ug/L	P300163	
		Copper	0.32	I	ug/L	P300163	
		Lead	0.15	I	ug/L	P300163	
		Nickel	0.18	I	ug/L	P300163	
		Silver	0.0050	U	ug/L	P300163	

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: Kissimmee River @ 1100m Upstream of lock

Collection Date/Time: 03/07/2016 11:25

Field ID: G4SE0083_03072016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1777549	EPA 180.1 Rev. 2.0	Turbidity	3.7		NTU	P299949	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P300102	
		Sulfate	6.8		mg SO4/L	P300105	
		Color (true)	88		PCU	P299987	
	SM 2320 B-97	Total Alkalinity	28		mg CaCO3/L	P300452	
	SM 2540 C-97	TDS	93		mg/L	P300416	
	SM 2540 D-97	TSS	4	I	mg/L	P300127	
	SM 4500 F-C-97	Fluoride	0.086	I	mg F/L	P300456	
1777553	EPA 350.1 Rev. 2.0	Ammonia-N	0.036		mg N/L	P300472	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P300346	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P300301	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P300404	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P300236	
1777557	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P299956	
1777592	EPA 200.7 Rev. 4.4	Calcium	11.3		mg/L	P300163	
		Iron	220		ug/L	P300163	
		Magnesium	3.01		mg/L	P300163	
		Potassium	2.5		mg/L	P300163	
		Sodium	10.8		mg/L	P300163	
		Zinc	5.0	U	ug/L	P300163	
	EPA 200.8 Rev. 5.4	Arsenic	0.56		ug/L	P300163	

Field ID: G4SE0083_03072016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1777592	EPA 200.8 Rev. 5.4	Cadmium	0.020	U	ug/L	P300163	
		Chromium	0.23		ug/L	P300163	
		Copper	0.36	I	ug/L	P300163	
		Lead	0.15	I	ug/L	P300163	
		Nickel	0.27		ug/L	P300163	
		Silver	0.0050	U	ug/L	P300163	

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: Kissimmee River @ 1400m Upstream of lock Collection Date/Time: 03/07/2016 11:40

Field ID: G4SE0084_03072016

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1777550	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P299949	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P300102	
		Sulfate	6.9		mg SO4/L	P300105	
	SM 2120 B	Color (true)	87		PCU	P299987	
	SM 2320 B-97	Total Alkalinity	28		mg CaCO3/L	P300452	
	SM 2540 C-97	TDS	94		mg/L	P300416	
	SM 2540 D-97	TSS	3	I	mg/L	P300127	
	SM 4500 F-C-97	Fluoride	0.086	I	mg F/L	P300456	
1777554	EPA 350.1 Rev. 2.0	Ammonia-N	0.036		mg N/L	P300472	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P300346	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P300302	
	EPA 365.1 Rev. 2.0	Total-P	0.053		mg P/L	P300404	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P300325	
1777558	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P299956	
1777593	EPA 200.7 Rev. 4.4	Calcium	11.1		mg/L	P300163	
		Iron	210		ug/L	P300163	
		Magnesium	2.94		mg/L	P300163	
		Potassium	2.5		mg/L	P300163	
		Sodium	10.6		mg/L	P300163	
		Zinc	5.0	U	ug/L	P300163	
	EPA 200.8 Rev. 5.4	Arsenic	0.53		ug/L	P300163	
		Cadmium	0.020	U	ug/L	P300163	
		Chromium	0.22		ug/L	P300163	
		Copper	0.33	I	ug/L	P300163	
		Lead	0.15	I	ug/L	P300163	
		Nickel	0.17	I	ug/L	P300163	
		Silver	0.0050	U	ug/L	P300163	

Ref. Method and Comment:

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

Quality Assurance Report

Method Blank Results

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P299949

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P300163

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: P300163

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: P300102

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300105

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P300472

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P300346

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300301

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300302

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P300404

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P299956

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

Reference Method: SM 2120 B
Batch ID: P299987

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P300452

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

Reference Method: SM 2540 C-97
Batch ID: P300416

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P300127

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P300456

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P300236

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

Reference Method: SM 5310 B-00
Batch ID: P300325

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: P300163

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	97.6		P	85 - 115
Iron	97.7		P	85 - 115
Magnesium	97.7		P	85 - 115
Potassium	101		P	85 - 115
Sodium	96.4		P	85 - 115
Zinc	98.4		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P300163

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.8		P	85 - 115
Cadmium	95.6		P	85 - 115
Chromium	94.0		P	85 - 115
Copper	94.1		P	85 - 115
Lead	89.0		P	85 - 115
Nickel	95.2		P	85 - 115
Silver	93.1		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300102

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300105

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P300472

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P300346

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300301

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300302

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P300404

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	93.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P299956

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P300452

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P300456

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P300236

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.1		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P300325

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P300163

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778121	Calcium	93.6		P	80 - 120
1778121	Iron	96.2	95.8	P/P	80 - 120
1778121	Magnesium	93.2		P	80 - 120
1778121	Potassium	97.6	97.3	P/P	80 - 120
1778121	Sodium	94.8		P	80 - 120
1778121	Zinc	96.3	96.0	P/P	80 - 120
1778511	Calcium	96.5		P	80 - 120
1778511	Iron	97.6		P	80 - 120
1778511	Magnesium	102		P	80 - 120
1778511	Potassium	99.4		P	80 - 120
1778511	Sodium	94.7		P	80 - 120
1778511	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P300163

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1778121	Arsenic	96.6	96.2	P/P	80 - 120
1778121	Cadmium	96.4	96.1	P/P	80 - 120
1778121	Chromium	92.5	92.5	P/P	80 - 120
1778121	Copper	87.7	88.6	P/P	80 - 120
1778121	Lead	88.7	88.3	P/P	80 - 120
1778121	Nickel	90.9	90.0	P/P	80 - 120
1778121	Silver	91.2	92.2	P/P	80 - 120
1778511	Arsenic	98.7		P	80 - 120
1778511	Cadmium	97.5		P	80 - 120
1778511	Chromium	94.8		P	80 - 120
1778511	Copper	91.1		P	80 - 120
1778511	Lead	90.0		P	80 - 120
1778511	Nickel	93.7		P	80 - 120
1778511	Silver	92.7		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300102

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777288	Chloride	104		P	90 - 110
1777548	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300105

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777288	Sulfate	100		P	90 - 110
1777548	Sulfate	99.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P300472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777709	Ammonia-N	99.5	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P300346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777551	Kjeldahl Nitrogen	91.1	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300301

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777552	NO2NO3-N	97.2	96.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300302

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777554	NO2NO3-N	97.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P300404

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777551	Total-P	92.7	94.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P299956

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777555	O-Phosphate-P	93.1	92.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P300456

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777690	Fluoride	94.6	95.1	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P300236

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777182	Organic Carbon	99.2		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P300325

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1777554	Organic Carbon	93.2	92.0	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P299949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777479	Turbidity	0.390	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P300163

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778121	Calcium	0.936	Spike	P	0 - 20
1778121	Iron	0.345	Spike	P	0 - 20
1778121	Magnesium	0.812	Spike	P	0 - 20
1778121	Potassium	0.231	Spike	P	0 - 20
1778121	Sodium	0.115	Spike	P	0 - 20
1778121	Zinc	0.311	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P300163

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1778121	Arsenic	0.410	Spike	P	0 - 20
1778121	Cadmium	0.262	Spike	P	0 - 20
1778121	Chromium	0.00159	Spike	P	0 - 20
1778121	Copper	0.995	Spike	P	0 - 20
1778121	Lead	0.411	Spike	P	0 - 20
1778121	Nickel	1.03	Spike	P	0 - 20
1778121	Silver	1.06	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300102

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777288	Chloride	0.0687	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777288	Sulfate	0.916	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P300472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777709	Ammonia-N	1.32	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P300346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777551	Kjeldahl Nitrogen	3.93	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777552	NO2NO3-N	0.966	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300302

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777554	NO2NO3-N	0.480	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P300404

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777551	Total-P	1.63	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P299956

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777555	O-Phosphate-P	0.300	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P299987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777547	Color (true)	0.424	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P300452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777690	Total Alkalinity	1.30	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P300416

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777877	TDS	4.88	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P300456

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777690	Fluoride	0.487	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P300236

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777182	Organic Carbon	0.604	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P300325

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1777554	Organic Carbon	0.626	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: A68081
Included Lab Sample IDs: 1777547, 1777548, 1777549, 1777550

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A68082
Included Lab Sample IDs: 1777555, 1777556, 1777557, 1777558

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.1	97.2	P/P	90 - 110
O-Phosphate-P	97.6	98.1	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A68089
Included Lab Sample IDs: 1777547, 1777548, 1777549, 1777550

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Chloride	101	100	P/P	90 - 110
Sulfate	100	99.1	P/P	90 - 110
Sulfate	99.1	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A68174

Included Lab Sample IDs: 1777551, 1777552, 1777553

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	97.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A68181

Included Lab Sample IDs: 1777590, 1777591, 1777592, 1777593

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	92.6	94.2	P/P	90 - 110
Iron	93.9	94.2	P/P	90 - 110
Magnesium	93.2	94.8	P/P	90 - 110
Potassium	96.2	96.4	P/P	90 - 110
Sodium	94.6	93.0	P/P	90 - 110
Zinc	98.7	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A68199

Included Lab Sample IDs: 1777551, 1777552, 1777553, 1777554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	99.0	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A68205

Included Lab Sample IDs: 1777554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.6	94.2	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A68254

Included Lab Sample IDs: 1777547, 1777548, 1777549, 1777550

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

Reference Method: SM 4500 F-C-97

Run ID: A68254

Included Lab Sample IDs: 1777547, 1777548, 1777549, 1777550

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A68260

Included Lab Sample IDs: 1777551, 1777552, 1777553, 1777554

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A68301

Included Lab Sample IDs: 1777551, 1777552, 1777553, 1777554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.8	96.8	P/P	90 - 110
Kjeldahl Nitrogen	96.8	98.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A68306

Included Lab Sample IDs: 1777590, 1777591, 1777592, 1777593

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	101	P/P	90 - 110
Cadmium	101	99.1	P/P	90 - 110
Chromium	97.6	98.0	P/P	90 - 110
Copper	99.3	98.1	P/P	90 - 110
Lead	98.1	97.6	P/P	90 - 110
Nickel	99.7	98.4	P/P	90 - 110
Silver	94.6	93.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A68308

Included Lab Sample IDs: 1777551, 1777552, 1777553

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A68352

Included Lab Sample IDs: 1777554

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	98.8	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				0.390	
EPA 200.7 Rev. 4.4	Calcium	97.6	93.6 96.5			0.936
	Iron	97.7	96.2 95.8 97.6			0.345
	Magnesium	97.7	93.2 102			0.812
	Potassium	101	97.6 97.3 99.4			0.231
	Sodium	96.4	94.8 94.7			0.115
	Zinc	98.4	96.3 96.0 102			0.311
EPA 200.8 Rev. 5.4	Arsenic	96.8	96.6 96.2 98.7			0.410
	Cadmium	95.6	96.4 96.1 97.5			0.262
	Chromium	94.0	92.5 92.5 94.8			0.0015
	Copper	94.1	87.7 88.6 91.1			0.995

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.8 Rev. 5.4	Lead	89.0	88.7	88.3	90.0		0.411
	Nickel	95.2	90.9	90.0	93.7		1.03
	Silver	93.1	91.2	92.2	92.7		1.06
EPA 300.0 Rev. 2.1	Chloride	104	104	103		0.0687	
	Sulfate	101	100	99.8		0.916	
EPA 350.1 Rev. 2.0	Ammonia-N	99.5	99.5	101			1.32
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	92.1	91.1	98.4			3.93
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	97.2	96.2			0.966
	NO2NO3-N	98.0	97.5	98.0			0.480
EPA 365.1 Rev. 2.0	Total-P	93.0	92.7	94.4			1.63
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	93.1	92.8			0.300
SM 2120 B	Color (true)					0.424	
SM 2320 B-97	Total Alkalinity	102				1.30	
SM 2540 C-97	TDS					4.88	
SM 4500 F-C-97	Fluoride	97.6	94.6	95.1			0.487
SM 5310 B-00	Organic Carbon	96.1	99.2				0.604
	Organic Carbon	92.4	93.2	92.0			0.626

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1777547, 1777548, 1777549, 1777550
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1777590, 1777591, 1777592, 1777593
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1777590, 1777591, 1777592, 1777593
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1777547, 1777548, 1777549, 1777550
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1777547, 1777548, 1777549, 1777550
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1777551, 1777552, 1777553, 1777554
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1777551, 1777552, 1777553, 1777554
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1777551, 1777552, 1777553, 1777554
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1777551, 1777552, 1777553, 1777554
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1777555, 1777556, 1777557, 1777558
SM 2120 B / E31780	True Color measured at 450 nm	1777547, 1777548, 1777549, 1777550
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1777547, 1777548, 1777549, 1777550
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1777547, 1777548, 1777549, 1777550
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1777547, 1777548, 1777549, 1777550
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1777547, 1777548, 1777549, 1777550
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1777551, 1777552, 1777553, 1777554

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	03/08/2016			03/08/2016 15:41	Sima Feizi	1777547, 1777548, 1777549, 1777550
EPA 200.7 Rev. 4.4	03/08/2016	03/10/2016	Elliott D. Healy	03/11/2016	Joshua Ayres	1777590, 1777591, 1777592, 1777593
EPA 200.8 Rev. 5.4	03/08/2016	03/10/2016	Elliott D. Healy	03/17/2016	Charles J. Peterson	1777590, 1777591, 1777592, 1777593
EPA 300.0 Rev. 2.1	03/08/2016			03/10/2016	Julia Storbeck	1777547, 1777548, 1777549, 1777550
EPA 350.1 Rev. 2.0	03/08/2016			03/16/2016	Diana M. Turner	1777551, 1777552, 1777553, 1777554
EPA 351.2 Rev. 2.0	03/08/2016	03/15/2016	Sofia Elnemr	03/17/2016	Rochelle Y Jackson	1777551, 1777552, 1777553, 1777554
EPA 353.2 Rev. 2.0	03/08/2016			03/11/2016	Diana M. Turner	1777551, 1777552, 1777553, 1777554
EPA 365.1 Rev. 2.0	03/08/2016	03/16/2016	Christopher Armour	03/18/2016	Lipi Saha	1777551, 1777552, 1777553, 1777554
EPA 365.1 Rev. 2.0 dissolved	03/08/2016			03/08/2016 15:17	Ping Hua	1777555
	03/08/2016			03/08/2016 15:41	Ping Hua	1777556
	03/08/2016			03/08/2016 15:42	Ping Hua	1777557
	03/08/2016			03/08/2016 15:43	Ping Hua	1777558
SM 2120 B	03/08/2016			03/08/2016 15:57	Blanca Fach	1777547
	03/08/2016			03/08/2016 16:00	Blanca Fach	1777548
	03/08/2016			03/08/2016 16:01	Blanca Fach	1777549
	03/08/2016			03/08/2016 16:02	Blanca Fach	1777550
SM 2320 B-97	03/08/2016			03/15/2016	Dale L. Simmons	1777547, 1777548, 1777549, 1777550
SM 2540 C-97	03/08/2016			03/08/2016	Yijie Li	1777547, 1777548, 1777549, 1777550
SM 2540 D-97	03/08/2016			03/08/2016	Yijie Li	1777547, 1777548, 1777549, 1777550
SM 4500 F-C-97	03/08/2016			03/15/2016	Dale L. Simmons	1777547, 1777548, 1777549, 1777550
SM 5310 B-00	03/08/2016			03/11/2016	Sofia Elnemr	1777551, 1777552, 1777553, 1777554