Chemical Analysis Report

SE-DIST-2016-03-22-02

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

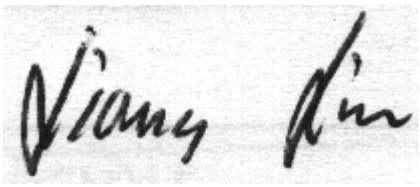
Event Description: **SMP_Kissimmee_3/21**
Request ID: **RQ-2016-03-21-63**
Customer: **SE-DIST**
Project ID: **SMP**

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: Liang Lin, Environmental Administrator

Date Certified: 12-APR-2016 11:04



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: Kissimmee River 5510m down of S-65A **Collection Date/Time: 03/21/2016 10:40**

Field ID: G4SE0081 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1782205	EPA 180.1 Rev. 2.0	Turbidity	2.9	A	NTU	P300845	
	EPA 300.0 Rev. 2.1	Chloride	19	A	mg Cl/L	P300934	
		Sulfate	6.7	A	mg SO4/L	P300936	
	SM 2120 B	Color (true)	85		PCU	P300801	
	SM 2320 B-97	Total Alkalinity	30		mg CaCO3/L	P301441	
	SM 2540 C-97	TDS	89		mg/L	P301224	
	SM 2540 D-97	TSS	4	I	mg/L	P301152	
	SM 4500 F-C-97	Fluoride	0.085	I	mg F/L	P301092	
1782209	EPA 350.1 Rev. 2.0	Ammonia-N	0.084		mg N/L	P301331	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P301245	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P301005	
	EPA 365.1 Rev. 2.0	Total-P	0.057		mg P/L	P301257	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P301142	
1782213	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P300814	
1782225	EPA 200.7 Rev. 4.4	Calcium	12.4		mg/L	P300967	
		Iron	270		ug/L	P300967	
		Magnesium	3.21		mg/L	P300967	
		Potassium	2.5		mg/L	P300967	
		Sodium	11.0		mg/L	P300967	
		Zinc	5.0	U	ug/L	P300967	
	EPA 200.8 Rev. 5.4	Arsenic	0.61		ug/L	P300967	
		Cadmium	0.050	U	ug/L	P300967	
		Chromium	0.30	U	ug/L	P300967	
		Copper	0.50	U	ug/L	P300967	
		Lead	0.22	I	ug/L	P300967	
		Nickel	0.25	U	ug/L	P300967	
		Silver	0.025	U	ug/L	P300967	

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 825m down of S-65A **Collection Date/Time: 03/21/2016 10:55**

Field ID: G4SE0082 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1782206	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P300845	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P300934	
		Sulfate	6.8		mg SO4/L	P300936	
	SM 2120 B	Color (true)	86		PCU	P300801	
	SM 2320 B-97	Total Alkalinity	30		mg CaCO3/L	P301441	
	SM 2540 C-97	TDS	90		mg/L	P301225	
	SM 2540 D-97	TSS	5	I	mg/L	P301153	
	SM 4500 F-C-97	Fluoride	0.087	I	mg F/L	P301092	
1782210	EPA 350.1 Rev. 2.0	Ammonia-N	0.086		mg N/L	P301332	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P301245	

Field ID: G4SE0082 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1782210	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P301005	
	EPA 365.1 Rev. 2.0	Total-P	0.059		mg P/L	P301257	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P301142	
1782214	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P300814	
1782226	EPA 200.7 Rev. 4.4	Calcium	12.4		mg/L	P300967	
		Iron	300		ug/L	P300967	
		Magnesium	3.23		mg/L	P300967	
		Potassium	2.4		mg/L	P300967	
		Sodium	11.0		mg/L	P300967	
		Zinc	5.0	U	ug/L	P300967	
	EPA 200.8 Rev. 5.4	Arsenic	0.59		ug/L	P300967	
		Cadmium	0.050	U	ug/L	P300967	
		Chromium	0.30	U	ug/L	P300967	
		Copper	0.50	U	ug/L	P300967	
		Lead	0.20	U	ug/L	P300967	
		Nickel	0.25	U	ug/L	P300967	
		Silver	0.025	U	ug/L	P300967	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Kissimmee River 1100m down of S-65A **Collection Date/Time: 03/21/2016 11:10**

Field ID: G4SE0083 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1782207	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P300845	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P300934	
		Sulfate	6.7		mg SO4/L	P300936	
	SM 2120 B	Color (true)	87		PCU	P300801	
	SM 2320 B-97	Total Alkalinity	30		mg CaCO3/L	P301441	
	SM 2540 C-97	TDS	94		mg/L	P301225	
	SM 2540 D-97	TSS	6	I	mg/L	P301153	
	SM 4500 F-C-97	Fluoride	0.088	I	mg F/L	P301092	
1782211	EPA 350.1 Rev. 2.0	Ammonia-N	0.085		mg N/L	P301332	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P301245	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P301006	
	EPA 365.1 Rev. 2.0	Total-P	0.059		mg P/L	P301257	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P301142	
1782215	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P300814	
1782227	EPA 200.7 Rev. 4.4	Calcium	12.4		mg/L	P300967	
		Iron	290		ug/L	P300967	
		Magnesium	3.20		mg/L	P300967	
		Potassium	2.5		mg/L	P300967	
		Sodium	11.0		mg/L	P300967	
		Zinc	5.0	U	ug/L	P300967	

Field ID: G4SE0083 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1782227	EPA 200.8 Rev. 5.4	Arsenic	0.57		ug/L	P300967	
		Cadmium	0.050	U	ug/L	P300967	
		Chromium	0.30	U	ug/L	P300967	
		Copper	0.50	U	ug/L	P300967	
		Lead	0.20	U	ug/L	P300967	
		Nickel	0.25	U	ug/L	P300967	
		Silver	0.025	U	ug/L	P300967	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Kissimmee River 1375 m down S-65A **Collection Date/Time: 03/21/2016 11:25**

Field ID: G4SE0084 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1782208	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P300845	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P300934	
		Sulfate	6.7		mg SO4/L	P300936	
	SM 2120 B	Color (true)	87		PCU	P300801	
	SM 2320 B-97	Total Alkalinity	31		mg CaCO3/L	P301441	
	SM 2540 C-97	TDS	93		mg/L	P301225	
	SM 2540 D-97	TSS	7	I	mg/L	P301153	
	SM 4500 F-C-97	Fluoride	0.088	I	mg F/L	P301092	
1782212	EPA 350.1 Rev. 2.0	Ammonia-N	0.094		mg N/L	P301332	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P301245	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P301006	
	EPA 365.1 Rev. 2.0	Total-P	0.061		mg P/L	P301257	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P301142	
1782216	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P300815	
1782228	EPA 200.7 Rev. 4.4	Calcium	12.5		mg/L	P300967	
		Iron	300		ug/L	P300967	
		Magnesium	3.19		mg/L	P300967	
		Potassium	2.4		mg/L	P300967	
		Sodium	10.7		mg/L	P300967	
		Zinc	5.0	U	ug/L	P300967	
	EPA 200.8 Rev. 5.4	Arsenic	0.59		ug/L	P300967	
		Cadmium	0.050	U	ug/L	P300967	
		Chromium	0.30	U	ug/L	P300967	
		Copper	0.50	U	ug/L	P300967	
		Lead	0.20	U	ug/L	P300967	
		Nickel	0.25	I	ug/L	P300967	
		Silver	0.025	U	ug/L	P300967	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P300845

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P300967

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: P300967

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.050	U	ug/L
Chromium	0.30	U	ug/L
Copper	0.50	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.25	U	ug/L
Silver	0.025	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300934

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300936

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301331

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301332

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301245

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301005

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301006

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301257

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300814

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300815

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

Reference Method: SM 2120 B
Batch ID: P300801

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P301441

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

Reference Method: SM 2540 C-97
Batch ID: P301224

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P301225

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P301152

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P301153

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P301092

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P301142

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: P300967

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	108		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	104		P	85 - 115
Sodium	104		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P300967

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.0		P	85 - 115
Cadmium	96.2		P	85 - 115
Chromium	95.9		P	85 - 115
Copper	95.3		P	85 - 115
Lead	92.6		P	85 - 115
Nickel	94.1		P	85 - 115
Silver	98.3		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300934

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300936

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301331

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301332

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301005

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301006

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301257

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300814

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300815

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

Reference Method: SM 2320 B-97
Batch ID: P301441

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

Reference Method: SM 4500 F-C-97
Batch ID: P301092

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.2		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P301142

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P300967

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782130	Calcium	108		P	80 - 120
1782130	Iron	105	106	P/P	80 - 120
1782130	Magnesium	108		P	80 - 120
1782130	Potassium	100	102	P/P	80 - 120
1782130	Sodium	106		P	80 - 120
1782130	Zinc	101	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P300967

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782130	Arsenic	98.9	99.2	P/P	80 - 120
1782130	Cadmium	97.6	96.8	P/P	80 - 120
1782130	Chromium	95.0	94.1	P/P	80 - 120
1782130	Copper	92.4	95.0	P/P	80 - 120
1782130	Lead	94.8	95.0	P/P	80 - 120
1782130	Nickel	94.1	91.5	P/P	80 - 120
1782130	Silver	98.5	96.5	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300934

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782205	Chloride	101		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300934

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782234	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300936

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782205	Sulfate	99.2		P	90 - 110
1782234	Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782166	Ammonia-N	98.6	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301245

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782166	Kjeldahl Nitrogen	92.0	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301005

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782210	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301006

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782211	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782209	Total-P	103	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300814

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782102	O-Phosphate-P	96.4	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782240	O-Phosphate-P	96.2	98.4	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P301092

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782234	Fluoride	95.3	95.9	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P301142

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1782135	Organic Carbon	102		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P300845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782205	Turbidity	6.21	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P300967

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782130	Calcium	0.467	Spike	P	0 - 20
1782130	Iron	1.02	Spike	P	0 - 20
1782130	Magnesium	0.532	Spike	P	0 - 20
1782130	Potassium	1.06	Spike	P	0 - 20
1782130	Sodium	0.415	Spike	P	0 - 20
1782130	Zinc	0.0332	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P300967

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782130	Arsenic	0.256	Spike	P	0 - 20
1782130	Cadmium	0.829	Spike	P	0 - 20
1782130	Chromium	0.903	Spike	P	0 - 20
1782130	Copper	2.70	Spike	P	0 - 20
1782130	Lead	0.194	Spike	P	0 - 20
1782130	Nickel	2.73	Spike	P	0 - 20
1782130	Silver	2.03	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300934

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782205	Chloride	0.0823	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300936

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782205	Sulfate	0.847	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782166	Ammonia-N	0.0101	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301332

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782212	Ammonia-N	0.643	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782166	Kjeldahl Nitrogen	5.52	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301005

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782210	NO2NO3-N	0.913	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P301006

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782211	NO2NO3-N	0.917	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782209	Total-P	4.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300814

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782102	O-Phosphate-P	2.96	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782240	O-Phosphate-P	2.05	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P300801

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782160	Color (true)	0.373	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P301441

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782234	Total Alkalinity	1.87	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P301224

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782092	TDS	4.01	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P301225

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782242	TDS	7.22	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P301092

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782234	Fluoride	0.536	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P301142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1782135	Organic Carbon	0.267	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A68373
Included Lab Sample IDs: 1782205, 1782206, 1782207, 1782208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.1	95.0	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A68375
Included Lab Sample IDs: 1782213, 1782214, 1782215, 1782216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	97.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A68388
Included Lab Sample IDs: 1782205, 1782206, 1782207, 1782208

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A68401
Included Lab Sample IDs: 1782205, 1782206, 1782207, 1782208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.4	P/P	90 - 110
Chloride	99.1	100	P/P	90 - 110
Sulfate	96.5	98.7	P/P	90 - 110
Sulfate	98.7	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A68424
Included Lab Sample IDs: 1782209, 1782210, 1782211, 1782212

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	101	P/P	90 - 110
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A68457
Included Lab Sample IDs: 1782205, 1782206, 1782207, 1782208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.1	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A68474
Included Lab Sample IDs: 1782225, 1782226, 1782227, 1782228

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.8	99.5	P/P	90 - 110
Arsenic	99.8	96.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A68477
Included Lab Sample IDs: 1782209, 1782210, 1782211, 1782212

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	99.2	P/P	90 - 110
Organic Carbon	99.2	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A68498
Included Lab Sample IDs: 1782225, 1782226, 1782227, 1782228

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.7	99.8	P/P	90 - 110
Iron	103	104	P/P	90 - 110
Magnesium	102	104	P/P	90 - 110
Potassium	98.3	98.2	P/P	90 - 110
Sodium	97.5	96.9	P/P	90 - 110
Zinc	101	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A68504
Included Lab Sample IDs: 1782225, 1782226, 1782227, 1782228

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	97.4	99.7	P/P	90 - 110
Cadmium	99.7	98.6	P/P	90 - 110
Chromium	94.0	97.6	P/P	90 - 110
Chromium	97.6	94.8	P/P	90 - 110
Copper	97.2	98.4	P/P	90 - 110
Copper	98.4	96.3	P/P	90 - 110
Lead	97.0	99.7	P/P	90 - 110
Lead	99.7	97.4	P/P	90 - 110
Nickel	95.3	97.9	P/P	90 - 110
Nickel	97.9	94.3	P/P	90 - 110
Silver	97.8	100	P/P	90 - 110
Silver	100	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A68548
Included Lab Sample IDs: 1782209, 1782210, 1782211, 1782212

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.7	P/P	90 - 110
Ammonia-N	99.7	99.3	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A68600
Included Lab Sample IDs: 1782205, 1782206, 1782207, 1782208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A68629
Included Lab Sample IDs: 1782209, 1782210, 1782211, 1782212

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.5	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A68672
Included Lab Sample IDs: 1782209, 1782210, 1782211, 1782212

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	101	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					6.21	
EPA 200.7 Rev. 4.4	Calcium	106	108				0.467
	Iron	108	105	106			1.02
	Magnesium	107	108				0.532
	Potassium	104	100	102			1.06
	Sodium	104	106				0.415
	Zinc	102	101	101			0.0332
EPA 200.8 Rev. 5.4	Arsenic	95.0	98.9	99.2			0.256
	Cadmium	96.2	97.6	96.8			0.829
	Chromium	95.9	95.0	94.1			0.903
	Copper	95.3	92.4	95.0			2.70
	Lead	92.6	94.8	95.0			0.194
	Nickel	94.1	94.1	91.5			2.73
	Silver	98.3	98.5	96.5			2.03
EPA 300.0 Rev. 2.1	Chloride	102	101	102		0.0823	
	Sulfate	99.2	99.2	98.9		0.847	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	98.6	98.6			0.0101
	Ammonia-N	98.5					0.643
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.9	92.0	99.0			5.52
EPA 353.2 Rev. 2.0	NO2NO3-N	104	101	102			0.913
	NO2NO3-N	105	100	101			0.917
EPA 365.1 Rev. 2.0	Total-P	98.3	103	98.4			4.02
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.4	99.3			2.96
	O-Phosphate-P	100	96.2	98.4			2.05
SM 2120 B	Color (true)					0.373	
SM 2320 B-97	Total Alkalinity	102				1.87	
SM 2540 C-97	TDS					4.01	
	TDS					7.22	
SM 4500 F-C-97	Fluoride	96.2	95.3	95.9			0.536
SM 5310 B-00	Organic Carbon	100	102				0.267

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1782205, 1782206, 1782207, 1782208
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1782225, 1782226, 1782227, 1782228
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1782225, 1782226, 1782227, 1782228
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1782205, 1782206, 1782207, 1782208
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1782205, 1782206, 1782207, 1782208
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1782209, 1782210, 1782211, 1782212
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1782209, 1782210, 1782211, 1782212
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1782209, 1782210, 1782211, 1782212
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1782209, 1782210, 1782211, 1782212
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1782213, 1782214, 1782215, 1782216
SM 2120 B / E31780	True Color measured at 450 nm	1782205, 1782206, 1782207, 1782208
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1782205, 1782206, 1782207, 1782208
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1782205, 1782206, 1782207, 1782208
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1782205, 1782206, 1782207, 1782208
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1782205, 1782206, 1782207, 1782208
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1782209, 1782210, 1782211, 1782212

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	03/22/2016			03/22/2016 15:57	Blanca Fach	1782205, 1782206, 1782207, 1782208
EPA 200.7 Rev. 4.4	03/22/2016	03/24/2016	Elliott D. Healy	03/28/2016	Joshua Ayres	1782225, 1782226, 1782227, 1782228
EPA 200.8 Rev. 5.4	03/22/2016	03/24/2016	Elliott D. Healy	03/25/2016	Charles J. Peterson	1782225, 1782226, 1782227, 1782228
	03/22/2016	03/24/2016	Elliott D. Healy	03/28/2016	Charles J. Peterson	1782225, 1782226, 1782227, 1782228
EPA 300.0 Rev. 2.1	03/22/2016			03/24/2016	Julia Storbeck	1782205, 1782206, 1782207, 1782208
EPA 350.1 Rev. 2.0	03/22/2016			03/30/2016	Diana M. Turner	1782209, 1782210, 1782211, 1782212
EPA 351.2 Rev. 2.0	03/22/2016	03/30/2016	Sofia Elnemr	04/04/2016	Virginia P. Brown	1782209, 1782210, 1782211, 1782212
EPA 353.2 Rev. 2.0	03/22/2016			03/24/2016	Peter D. Kaus	1782209, 1782210, 1782211, 1782212
EPA 365.1 Rev. 2.0	03/22/2016	03/30/2016	Christopher Armour	04/01/2016	Lipi Saha	1782209, 1782210, 1782211, 1782212
EPA 365.1 Rev. 2.0 dissolved	03/22/2016			03/22/2016 14:52	Ping Hua	1782213
	03/22/2016			03/22/2016 14:53	Ping Hua	1782214
	03/22/2016			03/22/2016 14:54	Ping Hua	1782215
	03/22/2016			03/22/2016 14:55	Ping Hua	1782216
SM 2120 B	03/22/2016			03/22/2016 14:35	Rochelle Y Jackson	1782205
	03/22/2016			03/22/2016 14:36	Rochelle Y Jackson	1782206
	03/22/2016			03/22/2016 14:37	Rochelle Y Jackson	1782207
	03/22/2016			03/22/2016 14:38	Rochelle Y Jackson	1782208
SM 2320 B-97	03/22/2016			03/29/2016	Dale L. Simmons	1782205, 1782206, 1782207, 1782208
SM 2540 C-97	03/22/2016			03/24/2016	Yijie Li	1782205, 1782206, 1782207, 1782208
SM 2540 D-97	03/22/2016			03/24/2016	Yijie Li	1782205, 1782206, 1782207, 1782208
SM 4500 F-C-97	03/22/2016			03/25/2016	Dale L. Simmons	1782205, 1782206, 1782207, 1782208
SM 5310 B-00	03/22/2016			03/26/2016	Sofia Elnemr	1782209, 1782210, 1782211, 1782212