

Chemical Analysis Report

SE-DIST-2016-06-02-02

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

Event Description: **SMP- Everglades Run**

Request ID: **RQ-2016-05-30-26**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

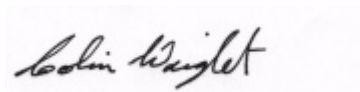
FL Dept. of Environmental Protection
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Certified by: Colin Wright, Environmental Administrator

Date Certified: 23-JUN-2016 10:52



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: WCA3L-67 @ S-151

Collection Date/Time: 06/01/2016 10:50

Field ID: G5SE0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1804016	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P305525	
	EPA 300.0 Rev. 2.1	Chloride	60		mg Cl/L	P305826	
		Sulfate	12		mg SO4/L	P305827	
	SM 2120 B	Color (true)	110	A	PCU	P305489	
	SM 2320 B-97	Total Alkalinity	168		mg CaCO3/L	P305782	
	SM 2540 C-97	TDS	324	A	mg/L	P306188	
	SM 2540 D-97	TSS	2	U	mg/L	P306039	
	SM 4500 F-C-97	Fluoride	0.31		mg F/L	P305785	
1804020	EPA 350.1 Rev. 2.0	Ammonia-N	0.073		mg N/L	P305906	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P305674	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.037		mg N/L	P305538	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P305993	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P306213	
1804024	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P305483	
1804051	EPA 200.7 Rev. 4.4	Calcium	57.8		mg/L	P305643	
		Iron	77	I	ug/L	P305643	
		Magnesium	13.8		mg/L	P305643	
		Potassium	3.7		mg/L	P305643	
		Sodium	41.7		mg/L	P305643	
		Zinc	5.0	U	ug/L	P305643	
	EPA 200.8 Rev. 5.4	Arsenic	1.15		ug/L	P305643	
		Cadmium	0.020	U	ug/L	P305643	
		Chromium	0.34		ug/L	P305643	
		Copper	0.10	U	ug/L	P305643	
		Lead	0.070	I	ug/L	P305643	
		Nickel	0.24		ug/L	P305643	
		Silver	0.0050	U	ug/L	P305643	

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: WCA2B @ S-141

Collection Date/Time: 06/01/2016 11:45

Field ID: G5SE0040

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1804017	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P305525	
	EPA 300.0 Rev. 2.1	Chloride	88		mg Cl/L	P305826	
		Sulfate	47		mg SO4/L	P305827	
	SM 2120 B	Color (true)	110		PCU	P305489	
	SM 2320 B-97	Total Alkalinity	194		mg CaCO3/L	P305782	
	SM 2540 C-97	TDS	454		mg/L	P306188	
	SM 2540 D-97	TSS	2	U	mg/L	P306039	
	SM 4500 F-C-97	Fluoride	0.49		mg F/L	P305785	
1804021	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P305906	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P305674	MS

Field ID: G5SE0040

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1804021	EPA 353.2 Rev. 2.0	NO2NO3-N	0.028		mg N/L	P305539	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P305994	
	SM 5310 B-00	Organic Carbon	28		mg C/L	P306213	
1804025	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P305483	
1804052	EPA 200.7 Rev. 4.4	Calcium	74.1		mg/L	P305643	
		Iron	30	U	ug/L	P305643	
		Magnesium	21.4		mg/L	P305643	
		Potassium	7.3		mg/L	P305643	
		Sodium	57.9		mg/L	P305643	
		Zinc	5.0	U	ug/L	P305643	
	EPA 200.8 Rev. 5.4	Arsenic	1.73		ug/L	P305643	
		Cadmium	0.020	U	ug/L	P305643	
		Chromium	0.096	I	ug/L	P305643	
		Copper	0.10	I	ug/L	P305643	
		Lead	0.050	U	ug/L	P305643	
		Nickel	0.23		ug/L	P305643	
		Silver	0.0050	U	ug/L	P305643	

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: WCA1 L39 CANAL

Collection Date/Time: 06/01/2016 13:10

Field ID: G5SE0019

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1804018	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P305525	
	EPA 300.0 Rev. 2.1	Chloride	96		mg Cl/L	P305826	
		Sulfate	36		mg SO4/L	P305827	
		Color (true)	110		PCU	P305489	
	SM 2320 B-97	Total Alkalinity	143		mg CaCO3/L	P305782	
	SM 2540 C-97	TDS	404		mg/L	P306188	
	SM 2540 D-97	TSS	2	I	mg/L	P306039	
	SM 4500 F-C-97	Fluoride	0.30		mg F/L	P305785	
1804022	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P305906	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P305674	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P305539	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P305994	
	SM 5310 B-00	Organic Carbon	26		mg C/L	P306213	
1804026	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P305483	
1804053	EPA 200.7 Rev. 4.4	Calcium	53.2		mg/L	P305643	
		Iron	30	U	ug/L	P305643	
		Magnesium	14.9		mg/L	P305643	
		Potassium	6.2		mg/L	P305643	
		Sodium	66.0		mg/L	P305643	
		Zinc	5.0	U	ug/L	P305643	
	EPA 200.8 Rev. 5.4	Arsenic	1.34		ug/L	P305643	

Field ID: G5SE0019

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1804053	EPA 200.8 Rev. 5.4	Cadmium	0.020	U	ug/L	P305643	
		Chromium	0.11	I	ug/L	P305643	
		Copper	0.24	I	ug/L	P305643	
		Lead	0.071	I	ug/L	P305643	
		Nickel	0.17	I	ug/L	P305643	
		Silver	0.0050	U	ug/L	P305643	

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: WCA1_L-7 NE OF S6 STRUCTURE

Collection Date/Time: 06/01/2016 13:20

Field ID: G5SE0018

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1804019	EPA 180.1 Rev. 2.0	Turbidity	1.9	A	NTU	P305526	
	EPA 300.0 Rev. 2.1	Chloride	93		mg Cl/L	P305826	
		Sulfate	35		mg SO4/L	P305827	
	SM 2120 B	Color (true)	110		PCU	P305489	
	SM 2320 B-97	Total Alkalinity	142		mg CaCO3/L	P305782	
	SM 2540 C-97	TDS	402		mg/L	P306188	
	SM 2540 D-97	TSS	2	I	mg/L	P306039	
	SM 4500 F-C-97	Fluoride	0.30		mg F/L	P305785	
1804023	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P305906	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P305675	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P305539	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P305994	
	SM 5310 B-00	Organic Carbon	27		mg C/L	P306213	
1804027	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P305485	
1804054	EPA 200.7 Rev. 4.4	Calcium	53.1		mg/L	P305643	
		Iron	30	U	ug/L	P305643	
		Magnesium	14.8		mg/L	P305643	
		Potassium	6.2		mg/L	P305643	
		Sodium	64.6		mg/L	P305643	
		Zinc	5.0	U	ug/L	P305643	
	EPA 200.8 Rev. 5.4	Arsenic	1.37		ug/L	P305643	
		Cadmium	0.020	U	ug/L	P305643	
		Chromium	0.12	I	ug/L	P305643	
		Copper	0.29	I	ug/L	P305643	
		Lead	0.051	I	ug/L	P305643	
		Nickel	0.18	I	ug/L	P305643	
		Silver	0.0050	U	ug/L	P305643	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high 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: P305525

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P305526

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P305643

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: P305643

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: P305826

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305827

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P305906

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: P305674

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P305675

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P305538

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P305539

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305993

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305994

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P305483

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P305485

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

Reference Method: SM 2120 B
Batch ID: P305489

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P305782

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

Reference Method: SM 2540 C-97
Batch ID: P306188

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P306039

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P305785

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P306213

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: P305643

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	109		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	103		P	85 - 115
Sodium	105		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P305643

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.9		P	85 - 115
Cadmium	98.5		P	85 - 115
Chromium	99.2		P	85 - 115
Copper	98.3		P	85 - 115
Lead	100		P	85 - 115
Nickel	98.7		P	85 - 115
Silver	96.5		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305826

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305827

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P305906

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P305674

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	91.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P305675

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P305538

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: P305539

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305993

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305994

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.6		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P305483

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P305485

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

Reference Method: SM 2320 B-97
Batch ID: P305782

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P305785

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.6		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P306213

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	103		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P305643

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803728	Calcium	109		P	80 - 120
1803728	Iron	108		P	80 - 120
1803728	Magnesium	105		P	80 - 120
1803728	Potassium	106		P	80 - 120
1803728	Sodium	107		P	80 - 120
1803728	Zinc	97.8		P	80 - 120
1804052	Calcium	108		P	80 - 120
1804052	Iron	108	110	P/P	80 - 120
1804052	Magnesium	110		P	80 - 120
1804052	Potassium	107		P	80 - 120
1804052	Sodium	106		P	80 - 120
1804052	Zinc	98.8	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P305643

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803728	Arsenic	98.7		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P305643

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803728	Cadmium	97.7		P	80 - 120
1803728	Chromium	98.0		P	80 - 120
1803728	Copper	92.5		P	80 - 120
1803728	Lead	98.6		P	80 - 120
1803728	Nickel	94.7		P	80 - 120
1803728	Silver	96.3		P	80 - 120
1804052	Arsenic	103	102	P/P	80 - 120
1804052	Cadmium	102	99.9	P/P	80 - 120
1804052	Chromium	100	99.4	P/P	80 - 120
1804052	Copper	96.8	95.1	P/P	80 - 120
1804052	Lead	102	101	P/P	80 - 120
1804052	Nickel	96.4	97.1	P/P	80 - 120
1804052	Silver	97.0	96.1	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305826

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803985	Chloride	98.8		P	90 - 110
1804038	Chloride	99.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305827

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803985	Sulfate	96.2		P	90 - 110
1804038	Sulfate	97.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P305906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803994	Ammonia-N	99.3	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P305674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803975	Kjeldahl Nitrogen	86.4	89.0	F/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P305538

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803957	NO2NO3-N	102	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P305539

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1804022	NO2NO3-N	100	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305993

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803958	Total-P	96.0	97.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305994

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1804021	Total-P	99.2	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P305483

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803999	O-Phosphate-P	98.5	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P305485

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1804075	O-Phosphate-P	99.0	99.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P305785

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1804078	Fluoride	97.0	98.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P306213

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803895	Organic Carbon	96.4	102	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P305525

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803985	Turbidity	0.823	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P305526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804019	Turbidity	7.37	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P305643

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804052	Calcium	6.01	Spike	P	0 - 20
1804052	Iron	1.84	Spike	P	0 - 20
1804052	Magnesium	3.84	Spike	P	0 - 20
1804052	Potassium	3.08	Spike	P	0 - 20
1804052	Sodium	4.89	Spike	P	0 - 20
1804052	Zinc	2.06	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P305643

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804052	Arsenic	1.16	Spike	P	0 - 20
1804052	Cadmium	2.44	Spike	P	0 - 20
1804052	Chromium	0.993	Spike	P	0 - 20
1804052	Copper	1.75	Spike	P	0 - 20
1804052	Lead	0.550	Spike	P	0 - 20
1804052	Nickel	0.697	Spike	P	0 - 20
1804052	Silver	0.999	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305826

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803985	Chloride	0.173	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P305827

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803985	Sulfate	1.07	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P305906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803994	Ammonia-N	2.32	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P305674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803975	Kjeldahl Nitrogen	1.68	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P305675

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804023	Kjeldahl Nitrogen	1.99	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P305538

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803957	NO2NO3-N	1.95	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P305539

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804022	NO2NO3-N	2.94	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305993

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803958	Total-P	0.703	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P305994

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804021	Total-P	0.611	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P305483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803999	O-Phosphate-P	2.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P305485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804075	O-Phosphate-P	0.202	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P305489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804016	Color (true)	0.312	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P305782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804078	Total Alkalinity	0.380	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P306188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804016	TDS	0.0	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P305785

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1804078	Fluoride	1.47	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P306213

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803895	Organic Carbon	3.42	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: A69817
Included Lab Sample IDs: 1804024, 1804025, 1804026, 1804027

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

Reference Method: SM 2120 B
Run ID: A69818
Included Lab Sample IDs: 1804016, 1804017, 1804018, 1804019

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A69828
Included Lab Sample IDs: 1804016, 1804017, 1804018, 1804019

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105
Turbidity	101	100	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A69831

Included Lab Sample IDs: 1804020, 1804021, 1804022, 1804023

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A69904

Included Lab Sample IDs: 1804051, 1804052, 1804053, 1804054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	105	P/P	90 - 110
Calcium	104	102	P/P	90 - 110
Iron	101	104	P/P	90 - 110
Iron	103	101	P/P	90 - 110
Magnesium	102	105	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Potassium	100	102	P/P	90 - 110
Potassium	102	100	P/P	90 - 110
Sodium	101	103	P/P	90 - 110
Sodium	102	101	P/P	90 - 110
Zinc	99.2	99.5	P/P	90 - 110
Zinc	99.5	97.7	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A69913

Included Lab Sample IDs: 1804016, 1804017, 1804018, 1804019

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

Reference Method: SM 4500 F-C-97

Run ID: A69913

Included Lab Sample IDs: 1804016, 1804017, 1804018, 1804019

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A69916

Included Lab Sample IDs: 1804020, 1804021, 1804022, 1804023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	104	P/P	90 - 110
Kjeldahl Nitrogen	99.9	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A69924

Included Lab Sample IDs: 1804016, 1804017, 1804018, 1804019

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Chloride	101	100	P/P	90 - 110
Sulfate	97.8	99.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A69924

Included Lab Sample IDs: 1804016, 1804017, 1804018, 1804019

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	99.3	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A69936

Included Lab Sample IDs: 1804051, 1804052, 1804053, 1804054

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.2	98.4	P/P	90 - 110
Arsenic	98.8	98.2	P/P	90 - 110
Cadmium	96.1	98.1	P/P	90 - 110
Cadmium	98.1	97.4	P/P	90 - 110
Chromium	98.4	99.9	P/P	90 - 110
Chromium	99.9	99.6	P/P	90 - 110
Copper	97.3	97.3	P/P	90 - 110
Copper	98.8	97.3	P/P	90 - 110
Lead	96.1	97.0	P/P	90 - 110
Lead	97.0	96.4	P/P	90 - 110
Nickel	97.7	97.3	P/P	90 - 110
Nickel	98.3	97.7	P/P	90 - 110
Silver	95.1	95.1	P/P	90 - 110
Silver	95.1	95.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A69948

Included Lab Sample IDs: 1804020, 1804021, 1804022, 1804023

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A69966

Included Lab Sample IDs: 1804053

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	98.6	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A70015

Included Lab Sample IDs: 1804020, 1804021, 1804022, 1804023

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

Reference Method: SM 5310 B-00

Run ID: A70048

Included Lab Sample IDs: 1804020, 1804021, 1804022, 1804023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	101	P/P	90 - 110
Organic Carbon	103	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

* 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						0.823	
	Turbidity						7.37	
EPA 200.7 Rev. 4.4	Calcium	107	109	108				6.01
	Iron	109	108	108	110			1.84
	Magnesium	106	105	110				3.84
	Potassium	103	106	107				3.08
	Sodium	105	107	106				4.89
	Zinc	100	97.8	98.8	101			2.06
EPA 200.8 Rev. 5.4	Arsenic	99.9	98.7	103	102			1.16
	Cadmium	98.5	97.7	102	99.9			2.44
	Chromium	99.2	98.0	100	99.4			0.993
	Copper	98.3	92.5	96.8	95.1			1.75
	Lead	100	98.6	102	101			0.550
	Nickel	98.7	94.7	96.4	97.1			0.697
	Silver	96.5	96.3	97.0	96.1			0.999
EPA 300.0 Rev. 2.1	Chloride	100	98.8	99.0			0.173	
	Sulfate	97.7	96.2	97.4			1.07	
EPA 350.1 Rev. 2.0	Ammonia-N	99.9	99.3	102				2.32
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	91.7	86.4	89.0				1.68
	Kjeldahl Nitrogen	94.8						1.99
EPA 353.2 Rev. 2.0	NO2NO3-N	104	102	104				1.95
	NO2NO3-N	104	100	104				2.94
EPA 365.1 Rev. 2.0	Total-P	98.8	96.0	97.2				0.703
	Total-P	97.6	99.2	98.6				0.611
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	98.5	101				2.10
	O-Phosphate-P	102	99.0	99.2				0.202
SM 2120 B	Color (true)						0.312	
SM 2320 B-97	Total Alkalinity	103					0.380	
SM 2540 C-97	TDS						0.0	
SM 4500 F-C-97	Fluoride	98.6	97.0	98.6				1.47
SM 5310 B-00	Organic Carbon	103	96.4	102				3.42

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1804016, 1804017, 1804018, 1804019
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1804051, 1804052, 1804053, 1804054
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1804051, 1804052, 1804053, 1804054
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1804016, 1804017, 1804018, 1804019
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1804016, 1804017, 1804018, 1804019
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1804020, 1804021, 1804022, 1804023

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1804020, 1804021, 1804022, 1804023
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1804020, 1804021, 1804022, 1804023
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1804020, 1804021, 1804022, 1804023
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1804024, 1804025, 1804026, 1804027
SM 2120 B / E31780	True Color measured at 450 nm	1804016, 1804017, 1804018, 1804019
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1804016, 1804017, 1804018, 1804019
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1804016, 1804017, 1804018, 1804019
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1804016, 1804017, 1804018, 1804019
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1804016, 1804017, 1804018, 1804019
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1804020, 1804021, 1804022, 1804023

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	06/02/2016			06/02/2016 16:44	Blanca Fach	1804016, 1804017, 1804018, 1804019
EPA 200.7 Rev. 4.4	06/02/2016	06/06/2016	Elliott D. Healy	06/07/2016	Joshua Ayres	1804051, 1804052, 1804053, 1804054
EPA 200.8 Rev. 5.4	06/02/2016	06/06/2016	Elliott D. Healy	06/08/2016	Charles J. Peterson	1804051, 1804052, 1804053, 1804054
	06/02/2016	06/06/2016	Elliott D. Healy	06/09/2016	Charles J. Peterson	1804053
EPA 300.0 Rev. 2.1	06/02/2016			06/08/2016	Elisa J Lutz	1804016, 1804017, 1804018, 1804019
EPA 350.1 Rev. 2.0	06/02/2016			06/09/2016	Diana M. Turner	1804020, 1804021, 1804022, 1804023
EPA 351.2 Rev. 2.0	06/02/2016	06/07/2016	Sofia Elnemr	06/08/2016	Christopher Armour	1804020, 1804021, 1804022, 1804023
EPA 353.2 Rev. 2.0	06/02/2016			06/03/2016	Peter D. Kaus	1804020, 1804021, 1804022, 1804023
EPA 365.1 Rev. 2.0	06/02/2016	06/10/2016	Vijayalakshmi Reddy	06/14/2016	Lipi Saha	1804020, 1804021, 1804022, 1804023
EPA 365.1 Rev. 2.0 dissolved	06/02/2016			06/02/2016 17:22	Julia Storbeck	1804024
	06/02/2016			06/02/2016 17:23	Julia Storbeck	1804025
	06/02/2016			06/02/2016 17:24	Julia Storbeck	1804026, 1804027
SM 2120 B	06/02/2016			06/02/2016 19:16	Chrisoulla Rakowski	1804016, 1804017
	06/02/2016			06/02/2016 19:17	Chrisoulla Rakowski	1804018
	06/02/2016			06/02/2016 19:18	Chrisoulla Rakowski	1804019
SM 2320 B-97	06/02/2016			06/08/2016	Dale L. Simmons	1804016, 1804017, 1804018, 1804019
SM 2540 C-97	06/02/2016			06/06/2016	Blanca Fach	1804016, 1804017, 1804018, 1804019
SM 2540 D-97	06/02/2016			06/06/2016	Blanca Fach	1804016, 1804017, 1804018, 1804019
SM 4500 F-C-97	06/02/2016			06/08/2016	Dale L. Simmons	1804016, 1804017, 1804018, 1804019
SM 5310 B-00	06/02/2016			06/14/2016	Diana M. Turner	1804020, 1804021, 1804022, 1804023