

Chemical Analysis Report

SE-DIST-2017-04-25-01

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

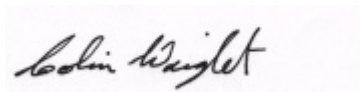
Event Description: **SMP-G5 Everglades Run**
Request ID: **RQ-2017-04-10-52**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 22-MAY-2017 12:26



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: Hillsboro Canal

Collection Date/Time: 04/24/2017 12:15

Field ID: G5SE0005

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1892081	EPA 180.1 Rev. 2.0	Turbidity	27		NTU	P323979	
	EPA 300.0 Rev. 2.1	Chloride	77		mg Cl/L	P324477	
		Sulfate	33		mg SO4/L	P324475	
	SM 2120 B	Color (true)	57		PCU	P324083	
	SM 2320 B-97	Total Alkalinity	153		mg CaCO3/L	P324652	
	SM 2540 C-97	TDS	406	A	mg/L	P324363	
	SM 2540 D-97	TSS	44	A	mg/L	P324369	
	SM 4500 F-C-97	Fluoride	0.33		mg F/L	P324654	RPD
1892082	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P324257	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.7		mg N/L	P324116	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.2		mg N/L	P324130	
	EPA 365.1 Rev. 2.0	Total-P	0.17		mg P/L	P324058	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P323998	
1892083	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.084		mg P/L	P323982	

Sample Location: WCA1 West

Collection Date/Time: 04/24/2017 12:25

Field ID: G5SE0019

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1892084	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P323979	
	EPA 300.0 Rev. 2.1	Chloride	130		mg Cl/L	P324477	
		Sulfate	47		mg SO4/L	P324475	
	SM 2120 B	Color (true)	71		PCU	P324082	
	SM 2320 B-97	Total Alkalinity	137		mg CaCO3/L	P324656	
	SM 2540 C-97	TDS	461		mg/L	P324363	
	SM 2540 D-97	TSS	3	I	mg/L	P324369	
	SM 4500 F-C-97	Fluoride	0.32		mg F/L	P325469	RPD
1892085	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P324257	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P324116	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.021		mg N/L	P324130	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P324058	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P323998	
1892086	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P323982	
1892100	EPA 200.7 Rev. 4.4	Calcium	47.3		mg/L	P324338	
		Iron	30	U	ug/L	P324338	
		Magnesium	18.5		mg/L	P324338	
		Potassium	7.2		mg/L	P324338	
		Sodium	89.1		mg/L	P324338	
		Zinc	5.0	U	ug/L	P324338	
	EPA 200.8 Rev. 5.4	Arsenic	1.30		ug/L	P324338	
		Cadmium	0.020	U	ug/L	P324338	
		Chromium	0.40	U	ug/L	P324338	
		Copper	0.25	I	ug/L	P324338	

Field ID: G5SE0019

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1892100	EPA 200.8 Rev. 5.4	Lead	0.057	I	ug/L	P324338	
		Nickel	0.20	U	ug/L	P324338	
		Silver	0.010	U	ug/L	P324338	

Ref. Method and Comment:

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for sodium are unavailable because of high analyte concentration in the QC sample.

Sample Location: WCA1 North

Collection Date/Time: 04/24/2017 13:00

Field ID: G5SE0046

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1892087	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P323979	
	EPA 300.0 Rev. 2.1	Chloride	180		mg Cl/L	P324477	
		Sulfate	51		mg SO4/L	P324475	
	SM 2120 B	Color (true)	71	A	PCU	P324082	
	SM 2320 B-97	Total Alkalinity	187		mg CaCO3/L	P324656	
	SM 2540 C-97	TDS	576		mg/L	P324363	
	SM 2540 D-97	TSS	4	I	mg/L	P324369	
	SM 4500 F-C-97	Fluoride	0.28		mg F/L	P325469	RPD
1892088	EPA 350.1 Rev. 2.0	Ammonia-N	0.054		mg N/L	P324257	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P324116	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.087		mg N/L	P324130	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P324177	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P323998	
1892089	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P323982	
1892101	EPA 200.7 Rev. 4.4	Calcium	68.1		mg/L	P324338	
		Iron	50	I	ug/L	P324338	
		Magnesium	19.2		mg/L	P324338	
		Potassium	8.7		mg/L	P324338	
		Sodium	113		mg/L	P324338	
		Zinc	7.4	I	ug/L	P324338	
	EPA 200.8 Rev. 5.4	Arsenic	1.73		ug/L	P324338	
		Beryllium	0.010	U	ug/L	P324338	
		Cadmium	0.020	U	ug/L	P324338	
		Chromium	0.40	U	ug/L	P324338	
		Copper	0.36	I	ug/L	P324338	
		Lead	0.086	I	ug/L	P324338	
		Nickel	0.20	U	ug/L	P324338	
		Silver	0.010	U	ug/L	P324338	

Ref. Method and Comment:

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for sodium are unavailable because of 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: P323979

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P324338

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: P324338

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Beryllium	0.010	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324475

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324477

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324257

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324116

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: P324130

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324058

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324177

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323982

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

Reference Method: SM 2120 B
Batch ID: P324082

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P324083

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P324652

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

Reference Method: SM 2320 B-97
Batch ID: P324656

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

Reference Method: SM 2540 C-97
Batch ID: P324363

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P324369

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P324654

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P325469

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P323998

Component	Result	Code	Units
Organic Carbon	0.5	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P324338

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	104		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	100		P	85 - 115
Sodium	102		P	85 - 115
Zinc	97.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P324338

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115
Beryllium	95.9		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	100		P	85 - 115
Copper	98.7		P	85 - 115
Lead	102		P	85 - 115
Nickel	100		P	85 - 115
Silver	99.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324475

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324475

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324477

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324257

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324116

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324130

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: P324058

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324177

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323982

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.6		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P324652

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P324656

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P324654

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.2		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P325469

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P323998

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P324338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892307	Calcium	105		P	80 - 120
1892307	Iron	104		P	80 - 120
1892307	Magnesium	105		P	80 - 120
1892307	Potassium	99.5		P	80 - 120
1892307	Zinc	104		P	80 - 120
1892481	Calcium	102		P	80 - 120
1892481	Iron	104	101	P/P	80 - 120
1892481	Magnesium	104	99.6	P/P	80 - 120
1892481	Potassium	99.7		P	80 - 120
1892481	Zinc	104	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P324338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892307	Arsenic	102		P	80 - 120
1892307	Beryllium	92.6		P	80 - 120
1892307	Cadmium	101		P	80 - 120
1892307	Chromium	96.7		P	80 - 120
1892307	Copper	97.2		P	80 - 120
1892307	Lead	101		P	80 - 120
1892307	Nickel	97.2		P	80 - 120
1892307	Silver	93.6		P	80 - 120
1892481	Arsenic	103	104	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P324338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892481	Beryllium	92.5	93.6	P/P	80 - 120
1892481	Cadmium	101	101	P/P	80 - 120
1892481	Chromium	95.6	97.4	P/P	80 - 120
1892481	Copper	96.8	96.6	P/P	80 - 120
1892481	Lead	102	103	P/P	80 - 120
1892481	Nickel	96.2	97.2	P/P	80 - 120
1892481	Silver	94.2	94.8	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324475

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892103	Sulfate	101		P	90 - 110
1892216	Sulfate	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324477

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892103	Chloride	95.1		P	90 - 110
1892216	Chloride	97.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892812	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324116

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892221	Kjeldahl Nitrogen	115	113	F/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324130

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892085	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324058

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892069	Total-P	102	94.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324177

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892475	Total-P	97.0	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892013	O-Phosphate-P	97.4	95.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P324654

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1891951	Fluoride	97.6	101	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P325469

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1892554	Fluoride	102	97.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P323998

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1891997	Organic Carbon	96.0	95.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323979

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892043	Turbidity	5.33	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P324338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892481	Calcium	2.82	Spike	P	0 - 20
1892481	Iron	2.80	Spike	P	0 - 20
1892481	Magnesium	2.58	Spike	P	0 - 20
1892481	Potassium	1.29	Spike	P	0 - 20
1892481	Sodium	3.01	Spike	P	0 - 20
1892481	Zinc	1.09	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P324338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892481	Arsenic	0.659	Spike	P	0 - 20
1892481	Beryllium	1.19	Spike	P	0 - 20
1892481	Cadmium	0.0931	Spike	P	0 - 20
1892481	Chromium	1.85	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P324338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892481	Copper	0.212	Spike	P	0 - 20
1892481	Lead	1.46	Spike	P	0 - 20
1892481	Nickel	1.06	Spike	P	0 - 20
1892481	Silver	0.632	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892103	Sulfate	0.370	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P324477

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892103	Chloride	0.203	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P324257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892812	Ammonia-N	0.410	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P324116

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892221	Kjeldahl Nitrogen	1.48	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P324130

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892085	NO2NO3-N	0.893	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892069	Total-P	7.62	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P324177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892475	Total-P	4.06	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892013	O-Phosphate-P	1.36	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P324082

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892087	Color (true)	0.451	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P324083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1891885	Color (true)	9.33	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P324652

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1891951	Total Alkalinity	0.195	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P324656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892272	Total Alkalinity	0.0449	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P324363

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892081	TDS	1.23	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P324369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892081	TSS	5.41	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P324654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1891951	Fluoride	3.01	Spike	F	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P325469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1892554	Fluoride	3.65	Spike	F	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P323998

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1891997	Organic Carbon	0.786	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: A75986
Included Lab Sample IDs: 1892083, 1892086, 1892089

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	98.4	P/P	90 - 110
O-Phosphate-P	98.6	98.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A75987
Included Lab Sample IDs: 1892081, 1892084, 1892087

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

Reference Method: SM 5310 B-00
Run ID: A75992
Included Lab Sample IDs: 1892082, 1892085, 1892088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.7	96.6	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A76021
Included Lab Sample IDs: 1892081, 1892084, 1892087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	105	105	P/P	85 - 115

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A76021

Included Lab Sample IDs: 1892081, 1892084, 1892087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	105	107	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A76029

Included Lab Sample IDs: 1892082, 1892085, 1892088

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 365.1 Rev. 2.0

Run ID: A76033

Included Lab Sample IDs: 1892082

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A76052

Included Lab Sample IDs: 1892085

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A76071

Included Lab Sample IDs: 1892082, 1892085, 1892088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A76075

Included Lab Sample IDs: 1892082, 1892085, 1892088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.3	96.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A76120

Included Lab Sample IDs: 1892088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.0	95.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A76134

Included Lab Sample IDs: 1892100, 1892101

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.4	94.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A76134

Included Lab Sample IDs: 1892100, 1892101

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	96.6	96.3	P/P	90 - 110
Cadmium	92.7	93.5	P/P	90 - 110
Chromium	96.6	97.5	P/P	90 - 110
Copper	96.9	96.0	P/P	90 - 110
Lead	98.1	98.4	P/P	90 - 110
Nickel	95.5	94.8	P/P	90 - 110
Silver	95.5	94.7	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A76148

Included Lab Sample IDs: 1892081, 1892084, 1892087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	104	P/P	90 - 110
Chloride	103	103	P/P	90 - 110
Sulfate	101	93.6	P/P	90 - 110
Sulfate	93.6	100	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A76196

Included Lab Sample IDs: 1892081, 1892084, 1892087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	102	P/P	90 - 110
Total Alkalinity	102	101	P/P	90 - 110
Total Alkalinity	103	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A76196

Included Lab Sample IDs: 1892081

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A76199

Included Lab Sample IDs: 1892100, 1892101

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	104	P/P	90 - 110
Iron	102	104	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Potassium	102	102	P/P	90 - 110
Sodium	99.8	102	P/P	90 - 110
Zinc	105	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A76498

Included Lab Sample IDs: 1892084, 1892087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A76498

Included Lab Sample IDs: 1892084, 1892087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.1	97.0	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				5.33	
EPA 200.7 Rev. 4.4	Calcium	104	105	102		2.82
	Iron	104	104	104		2.80
	Magnesium	105	105	104	99.6	2.58
	Potassium	100	99.5	99.7		1.29
	Sodium	102				3.01
	Zinc	97.6	104	104	103	1.09
EPA 200.8 Rev. 5.4	Arsenic	101	102	103	104	0.659
	Beryllium	95.9	92.6	92.5	93.6	1.19
	Cadmium	101	101	101		0.0931
	Chromium	100	96.7	95.6	97.4	1.85
	Copper	98.7	97.2	96.8	96.6	0.212
	Lead	102	101	102	103	1.46
	Nickel	100	97.2	96.2	97.2	1.06
	Silver	99.0	93.6	94.2	94.8	0.632
EPA 300.0 Rev. 2.1	Chloride	99.6	95.1	97.9	0.203	
	Sulfate	99.8	101	101	0.370	
EPA 350.1 Rev. 2.0	Ammonia-N	99.5	105	105		0.410
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	115	113		1.48
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	105	101	102		0.893
EPA 365.1 Rev. 2.0	Total-P	105	102	94.3		7.62
	Total-P	101	97.0	101		4.06
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	97.4	95.9		1.36
SM 2120 B	Color (true)				0.451	
	Color (true)				9.33	
SM 2320 B-97	Total Alkalinity	102			0.195	
	Total Alkalinity	102			0.0449	
SM 2540 C-97	TDS				1.23	
SM 2540 D-97	TSS				5.41	
SM 4500 F-C-97	Fluoride	97.2	97.6	101		3.01
	Fluoride	102	102	97.9		3.65
SM 5310 B-00	Organic Carbon	96.2	96.0	95.1		0.786

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1892081, 1892084, 1892087

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1892100, 1892101
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1892100, 1892101
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1892081, 1892084, 1892087
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1892081, 1892084, 1892087
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1892082, 1892085, 1892088
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1892082, 1892085, 1892088
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1892082, 1892085, 1892088
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1892082, 1892085, 1892088
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1892083, 1892086, 1892089
SM 2120 B / E31780	True Color measured at 450 nm	1892081, 1892084, 1892087
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1892081, 1892084, 1892087
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1892081, 1892084, 1892087
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1892081, 1892084, 1892087
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1892081, 1892084, 1892087
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1892082, 1892085, 1892088

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	04/25/2017			04/25/2017 15:41	Sima Feizi	1892081, 1892084, 1892087
EPA 200.7 Rev. 4.4	04/25/2017	05/01/2017	Elliott D. Healy	05/04/2017	Martin Acosta	1892100, 1892101
EPA 200.8 Rev. 5.4	04/25/2017	05/01/2017	Elliott D. Healy	05/02/2017	Betina Topolski	1892100, 1892101
EPA 300.0 Rev. 2.1	04/25/2017			05/03/2017	Ping Hua	1892081, 1892084, 1892087
EPA 350.1 Rev. 2.0	04/25/2017			04/28/2017	Julie Michelle Frank	1892082, 1892085, 1892088
EPA 351.2 Rev. 2.0	04/25/2017	04/27/2017	Adrian Shelby	04/28/2017	Joseph Suarez	1892082, 1892085, 1892088
EPA 353.2 Rev. 2.0	04/25/2017			04/27/2017	Beverly Y. Sanders	1892082, 1892085, 1892088
EPA 365.1 Rev. 2.0	04/25/2017	04/26/2017	Vijayalakshmi Reddy	04/27/2017	Lipi Saha	1892082, 1892085
	04/25/2017	04/28/2017	Vijayalakshmi Reddy	05/02/2017	Lipi Saha	1892088
EPA 365.1 Rev. 2.0 dissolved	04/25/2017			04/25/2017 14:29	Lipi Saha	1892083
	04/25/2017			04/25/2017 14:34	Lipi Saha	1892089
	04/25/2017			04/25/2017 14:35	Lipi Saha	1892086
SM 2120 B	04/25/2017			04/25/2017 17:37	Blanca Fach	1892087
	04/25/2017			04/25/2017 17:42	Blanca Fach	1892084
	04/25/2017			04/25/2017 17:49	Blanca Fach	1892081
SM 2320 B-97	04/25/2017			05/04/2017	Dale L. Simmons	1892081, 1892084, 1892087
SM 2540 C-97	04/25/2017			04/26/2017	Yijie Li	1892081, 1892084, 1892087
SM 2540 D-97	04/25/2017			04/26/2017	Yijie Li	1892081, 1892084, 1892087
SM 4500 F-C-97	04/25/2017			05/04/2017	Dale L. Simmons	1892081
	04/25/2017			05/18/2017	Dale L. Simmons	1892084, 1892087
SM 5310 B-00	04/25/2017			04/26/2017	Julie Michelle Frank	1892082, 1892085, 1892088