

Chemical Analysis Report

SE-DIST-2016-08-17-01

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

Event Description: **SMP-South brevard**

Request ID: **RQ-2016-08-15-81**

Customer: **SE-DIST**

Project ID: **SMP**

Send Reports to:

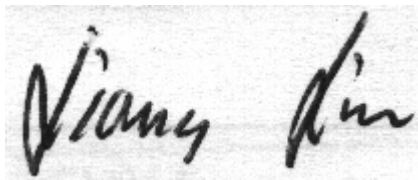
FL Dept. of Environmental Protection
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2199 South Rock Road
Fort Pierce, FL 34945
Attn: Matthew Sewell

For additional information please contact

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 09-SEP-2016 16:24

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Kid Creek @ Old Dixie Highway

Collection Date/Time: 08/16/2016 10:55

Field ID: G5SE0050

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824231	EPA 180.1 Rev. 2.0	Turbidity	1.0		NTU	P309890	
	EPA 300.0 Rev. 2.1	Chloride	100		mg Cl/L	P310310	
		Sulfate	13		mg SO4/L	P310313	
	SM 2120 B	Color (true)	91		PCU	P309910	
	SM 2320 B-97	Total Alkalinity	51		mg CaCO3/L	P310068	
	SM 2540 C-97	TDS	286		mg/L	P310529	
	SM 2540 D-97	TSS	2	U	mg/L	P310481	
	SM 4500 F-C-97	Fluoride	0.053	I	mg F/L	P310070	
1824233	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P309900	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P310083	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.035		mg N/L	P310341	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P309956	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P310368	
1824235	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P309906	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Micro Ditch @ Micro Rd

Collection Date/Time: 08/16/2016 11:35

Field ID: G5SE0048

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824232	EPA 180.1 Rev. 2.0	Turbidity	7.5		NTU	P309890	
	EPA 300.0 Rev. 2.1	Chloride	90		mg Cl/L	P310310	
		Sulfate	21		mg SO4/L	P310313	
	SM 2120 B	Color (true)	170		PCU	P309910	
	SM 2320 B-97	Total Alkalinity	156		mg CaCO3/L	P310068	
	SM 2540 C-97	TDS	396		mg/L	P310529	
	SM 2540 D-97	TSS	6	I	mg/L	P310481	
	SM 4500 F-C-97	Fluoride	0.21		mg F/L	P310070	
1824234	EPA 350.1 Rev. 2.0	Ammonia-N	0.11		mg N/L	P309900	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P310083	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.020		mg N/L	P310341	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P309956	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P310368	
1824236	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.051		mg P/L	P309906	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Indian River Lagoon S of SR 60

Collection Date/Time: 08/16/2016 13:15

Field ID: G5SE0051

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824237	EPA 180.1 Rev. 2.0	Turbidity	5.9		NTU	P309890	
	SM 2320 B-97	Total Alkalinity	135	A	mg CaCO3/L	P310069	
	SM 2540 D-97	TSS	7	I	mg/L	P310484	

Field ID: G5SE0051

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1824237	SM 4500 F-C-97	Fluoride	0.69		mg F/L	P310071	
1824238	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P309900	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.79		mg N/L	P310085	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.015		mg N/L	P310414	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P310336	
	SM 5310 B-00	Organic Carbon	9.6		mg C/L	P310368	
1824239	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.058		mg P/L	P309909	
1824244	EPA 200.7 Rev. 4.4	Iron	490		ug/L	P309952	
	EPA 200.8 Rev. 5.4	Arsenic	2.04		ug/L	P309952	
		Cadmium	0.060	U	ug/L	P309952	
		Chromium	0.50	I	ug/L	P309952	
		Copper	2.7		ug/L	P309952	
		Lead	0.28	I	ug/L	P309952	
		Silver	0.015	U	ug/L	P309952	
		Zinc	3.0	U	ug/L	P309952	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P309890

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P309952

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P309952

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
Silver	0.0050	U	ug/L
Zinc	1.0	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P310310

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310313

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309900

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310083

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310085

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310341

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310414

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309956

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310336

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309906

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309909

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

Reference Method: SM 2120 B
Batch ID: P309910

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P310068

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

Reference Method: SM 2320 B-97
Batch ID: P310069

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

Reference Method: SM 2540 C-97
Batch ID: P310529

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310481

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310484

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P310070

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P310071

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P310368

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: P309952

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309952

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.9		P	85 - 115
Cadmium	99.5		P	85 - 115
Chromium	99.5		P	85 - 115
Copper	97.3		P	85 - 115
Lead	99.9		P	85 - 115
Silver	101		P	85 - 115
Zinc	98.1		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310310

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310313

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309900

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310083

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310085

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310085

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310341

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310414

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309956

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310336

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309906

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309909

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

Reference Method: SM 2320 B-97
Batch ID: P310068

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P310069

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P310070

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.3		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P310071

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.8		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P310368

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1821625	Iron	98.2	102	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1821625	Arsenic	101	104	P/P	70 - 130
1821625	Cadmium	95.6	96.7	P/P	70 - 130
1821625	Chromium	87.4	86.7	P/P	70 - 130
1821625	Copper	90.1	92.8	P/P	70 - 130
1821625	Lead	103	104	P/P	70 - 130
1821625	Silver	92.7	93.5	P/P	70 - 130
1821625	Zinc	89.6	91.5	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310310

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823804	Chloride	99.7		P	90 - 110
1823876	Chloride	98.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310313

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823804	Sulfate	101		P	90 - 110
1823876	Sulfate	100		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824233	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824233	Kjeldahl Nitrogen	102	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310085

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824630	Kjeldahl Nitrogen	93.7	93.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310341

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823910	NO2NO3-N	100	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824238	NO2NO3-N	96.7	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309956

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824227	Total-P	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1826239	Total-P	94.8	94.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824192	O-Phosphate-P	97.0	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824347	O-Phosphate-P	97.3	98.1	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P310070

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824384	Fluoride	97.2	98.4	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P310071

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824237	Fluoride	98.0	98.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P310368

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1824227	Organic Carbon	100	93.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P309890

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824225	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1821625	Iron	3.96	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1821625	Arsenic	2.62	Spike	P	0 - 20
1821625	Cadmium	1.13	Spike	P	0 - 20
1821625	Chromium	0.710	Spike	P	0 - 20
1821625	Copper	2.92	Spike	P	0 - 20
1821625	Lead	1.32	Spike	P	0 - 20
1821625	Silver	0.899	Spike	P	0 - 20
1821625	Zinc	2.18	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310310

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823804	Chloride	0.124	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P310313

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823804	Sulfate	0.0762	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824233	Ammonia-N	0.678	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824233	Kjeldahl Nitrogen	1.79	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310085

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824630	Kjeldahl Nitrogen	0.0751	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310341

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823910	NO2NO3-N	1.24	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P310414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824238	NO2NO3-N	0.481	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309956

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824227	Total-P	1.50	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1826239	Total-P	0.0264	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824192	O-Phosphate-P	0.341	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824347	O-Phosphate-P	0.771	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P309910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824225	Color (true)	0.260	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P310068

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824384	Total Alkalinity	0.391	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P310069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824237	Total Alkalinity	1.34	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P310529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824184	TDS	5.93	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P310070

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824384	Fluoride	0.964	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P310071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824237	Fluoride	0.473	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P310368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1824227	Organic Carbon	4.25	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71180
Included Lab Sample IDs: 1824231, 1824232, 1824237

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71183
Included Lab Sample IDs: 1824233, 1824234, 1824238

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71188
Included Lab Sample IDs: 1824235, 1824236, 1824239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.8	P/P	90 - 110
O-Phosphate-P	99.8	99.7	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A71190
Included Lab Sample IDs: 1824231, 1824232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	101	P/P	90 - 115
Color (true)	99.6	98.2	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71233
Included Lab Sample IDs: 1824234

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A71241

Included Lab Sample IDs: 1824231, 1824232, 1824237

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.9	P/P	90 - 110
Total Alkalinity	99.9	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A71241

Included Lab Sample IDs: 1824231, 1824232, 1824237

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110
Fluoride	99.5	99.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A71256

Included Lab Sample IDs: 1824244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	101	93.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71266

Included Lab Sample IDs: 1824244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.4	99.6	P/P	90 - 110
Cadmium	95.6	96.9	P/P	90 - 110
Chromium	93.5	91.4	P/P	90 - 110
Copper	95.0	101	P/P	90 - 110
Lead	96.5	98.1	P/P	90 - 110
Silver	96.7	98.6	P/P	90 - 110
Zinc	95.7	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A71267

Included Lab Sample IDs: 1824233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.8	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A71276

Included Lab Sample IDs: 1824233, 1824234, 1824238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	104	P/P	90 - 110
Kjeldahl Nitrogen	104	108	P/P	90 - 110
Kjeldahl Nitrogen	105	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71280
Included Lab Sample IDs: 1824231, 1824232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Sulfate	96.7	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71323
Included Lab Sample IDs: 1824233, 1824234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	96.0	94.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71331
Included Lab Sample IDs: 1824238

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

Reference Method: SM 5310 B-00
Run ID: A71332
Included Lab Sample IDs: 1824233, 1824234, 1824238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.1	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71345
Included Lab Sample IDs: 1824238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	100	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				0.0	
EPA 200.7 Rev. 4.4	Iron	101	98.2 102			3.96
EPA 200.8 Rev. 5.4	Arsenic	98.9	101 104			2.62
	Cadmium	99.5	95.6 96.7			1.13
	Chromium	99.5	87.4 86.7			0.710
	Copper	97.3	90.1 92.8			2.92
	Lead	99.9	103 104			1.32
	Silver	101	92.7 93.5			0.899
	Zinc	98.1	89.6 91.5			2.18
EPA 300.0 Rev. 2.1	Chloride	100	99.7 98.8		0.124	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 300.0 Rev. 2.1	Sulfate	100	101	100		0.0762	
EPA 350.1 Rev. 2.0	Ammonia-N	104	105	105			0.678
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	102	105			1.79
	Kjeldahl Nitrogen	107	93.7	93.6			0.0751
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	98.5			1.24
	NO2NO3-N	102	96.7	96.2			0.481
EPA 365.1 Rev. 2.0	Total-P	102	101	102			1.50
	Total-P	99.5	94.8	94.7			0.0264
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	97.0	97.5			0.341
	O-Phosphate-P	102	97.3	98.1			0.771
SM 2120 B	Color (true)					0.260	
SM 2320 B-97	Total Alkalinity	103				0.391	
	Total Alkalinity	103				1.34	
SM 2540 C-97	TDS					5.93	
SM 4500 F-C-97	Fluoride	98.3	97.2	98.4			0.964
	Fluoride	97.8	98.0	98.6			0.473
SM 5310 B-00	Organic Carbon	96.5	100	93.5			4.25

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1824231, 1824232, 1824237
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1824244
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1824244
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1824231, 1824232
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1824231, 1824232
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1824233, 1824234, 1824238
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1824233, 1824234, 1824238
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1824233, 1824234, 1824238
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1824233, 1824234, 1824238
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1824235, 1824236, 1824239
SM 2120 B / E31780	True Color measured at 450 nm	1824231, 1824232
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1824231, 1824232, 1824237
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1824231, 1824232
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1824231, 1824232, 1824237
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1824231, 1824232, 1824237
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1824233, 1824234, 1824238

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	08/17/2016			08/17/2016 15:44	Sima Feizi	1824231, 1824232, 1824237
EPA 200.7 Rev. 4.4	08/17/2016	08/18/2016	Elliott D. Healy	08/22/2016	Joshua Ayres	1824244
EPA 200.8 Rev. 5.4	08/17/2016	08/18/2016	Elliott D. Healy	08/22/2016	Charles J. Peterson	1824244
EPA 300.0 Rev. 2.1	08/17/2016			08/24/2016	Ping Hua	1824231, 1824232
EPA 350.1 Rev. 2.0	08/17/2016			08/17/2016	Julie Michelle Frank	1824233, 1824234, 1824238
EPA 351.2 Rev. 2.0	08/17/2016	08/22/2016	Sofia Elnemr	08/23/2016	Christopher Armour	1824233, 1824234, 1824238
EPA 353.2 Rev. 2.0	08/17/2016			08/25/2016	Beverly Y. Sanders	1824233, 1824234
	08/17/2016			08/26/2016	Beverly Y. Sanders	1824238
EPA 365.1 Rev. 2.0	08/17/2016	08/18/2016	Vijayalakshmi Reddy	08/19/2016	Lipi Saha	1824234
	08/17/2016	08/18/2016	Vijayalakshmi Reddy	08/23/2016	Lipi Saha	1824233
	08/17/2016	08/25/2016	Vijayalakshmi Reddy	08/25/2016	Lipi Saha	1824238
EPA 365.1 Rev. 2.0 dissolved	08/17/2016			08/17/2016 15:27	Julia Storbeck	1824235
	08/17/2016			08/17/2016 15:28	Julia Storbeck	1824236
	08/17/2016			08/17/2016 15:37	Julia Storbeck	1824239
SM 2120 B	08/17/2016			08/17/2016 17:14	Rochelle Y Jackson	1824231
	08/17/2016			08/17/2016 17:42	Rochelle Y Jackson	1824232
SM 2320 B-97	08/17/2016			08/18/2016	Dale L. Simmons	1824231, 1824232, 1824237
SM 2540 C-97	08/17/2016			08/19/2016	Yijie Li	1824231, 1824232
SM 2540 D-97	08/17/2016			08/19/2016	Yijie Li	1824231, 1824232, 1824237
SM 4500 F-C-97	08/17/2016			08/18/2016	Dale L. Simmons	1824231, 1824232, 1824237
SM 5310 B-00	08/17/2016			08/25/2016	Sofia Elnemr	1824233, 1824234, 1824238