

Chemical Analysis Report

SE-DIST-2016-11-17-01

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

Event Description: **Micco, IRL, Kid**
Request ID: **RQ-2016-11-14-54**
Customer: **SE-DIST**
Project ID: **SMP**

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

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Certified by: Colin Wright, Environmental Administrator

Date Certified: 14-DEC-2016 09:46

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light-colored rectangular background.

Case Narrative

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

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

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

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

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

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: Kid Creek @ Old Dixie Highway

Collection Date/Time: 11/16/2016 11:00

Field ID: G5SE0050

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1851159	EPA 180.1 Rev. 2.0	Turbidity	0.95		NTU	P315420	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P316064	
		Sulfate	14		mg SO4/L	P316067	
	SM 2120 B	Color (true)	67		PCU	P315395	
	SM 2320 B-97	Total Alkalinity	54		mg CaCO3/L	P315673	
	SM 2540 C-97	TDS	283		mg/L	P316004	
	SM 2540 D-97	TSS	2	U	mg/L	P315756	
	SM 4500 F-C-97	Fluoride	0.047	I	mg F/L	P315676	
1851161	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P315789	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.22		mg N/L	P316148	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.040		mg N/L	P315842	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P315910	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P315408	
1851163	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.017		mg P/L	P315388	

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: Micco Ditch @ Micco Rd

Collection Date/Time: 11/16/2016 11:30

Field ID: G5SE0048

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1851160	EPA 180.1 Rev. 2.0	Turbidity	5.6		NTU	P315420	
	EPA 300.0 Rev. 2.1	Chloride	120		mg Cl/L	P316065	
		Sulfate	37		mg SO4/L	P316134	
	SM 2120 B	Color (true)	65		PCU	P315395	
	SM 2320 B-97	Total Alkalinity	223		mg CaCO3/L	P315673	
	SM 2540 C-97	TDS	487		mg/L	P316004	
	SM 2540 D-97	TSS	3	I	mg/L	P315756	
	SM 4500 F-C-97	Fluoride	0.25		mg F/L	P315676	
1851162	EPA 350.1 Rev. 2.0	Ammonia-N	0.11		mg N/L	P315789	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.73		mg N/L	P316148	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.057		mg N/L	P315842	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P315910	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315408	
1851164	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.021		mg P/L	P315388	

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 SR60

Collection Date/Time: 11/16/2016 12:20

Field ID: G5SE0051

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1851165	EPA 180.1 Rev. 2.0	Turbidity	4.0		NTU	P315420	
	EPA 300.0 Rev. 2.1	Sulfate	2.2E+03		mg SO4/L	P316134	
	SM 2320 B-97	Total Alkalinity	127	A	mg CaCO3/L	P315588	

Field ID: G5SE0051

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1851165	SM 2540 D-97	TSS	8	I	mg/L	P315759	
	SM 4500 F-C-97	Fluoride	0.99		mg F/L	P315593	
1851166	EPA 350.1 Rev. 2.0	Ammonia-N	0.053		mg N/L	P315959	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P316214	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.024		mg N/L	P315916	
	EPA 365.1 Rev. 2.0	Total-P	0.071		mg P/L	P315909	
	SM 5310 B-00	Organic Carbon	6.4		mg C/L	P315410	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.052		mg P/L	P315386	
1851171	EPA 200.7 Rev. 4.4	Iron	180	I	ug/L	P315644	
	EPA 200.8 Rev. 5.4	Arsenic	2.08		ug/L	P315644	
		Cadmium	0.060	U	ug/L	P315644	
		Chromium	0.41	I	ug/L	P315644	
		Copper	1.5	U	ug/L	P316456	
		Lead	0.26	I	ug/L	P315644	
		Silver	0.015	U	ug/L	P315644	
		Zinc	3.0	U	ug/L	P315644	

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: P315420

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P315644

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P315644

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Lead	0.050	U	ug/L
Silver	0.0050	U	ug/L
Zinc	1.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P316456

Component	Result	Code	Units
Copper	0.50	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316064

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316065

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316067

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316134

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315789

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315959

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316148

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316214

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315842

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315916

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315909

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315910

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315386

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315388

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

Reference Method: SM 2120 B
Batch ID: P315395

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P315588

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

Reference Method: SM 2320 B-97
Batch ID: P315673

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

Reference Method: SM 2540 C-97
Batch ID: P316004

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P315756

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P315759

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P315593

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P315676

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P315408

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

Reference Method: SM 5310 B-00
Batch ID: P315410

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: P315644

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P315644

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.6		P	85 - 115
Cadmium	99.8		P	85 - 115
Chromium	104		P	85 - 115
Lead	100		P	85 - 115
Silver	99.5		P	85 - 115
Zinc	101		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316456

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Copper	97.9		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316064

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316065

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316067

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316134

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315789

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315959

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316148

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316214

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315842

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: P315916

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315909

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: P315910

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: P315386

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: P315388

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

Reference Method: SM 2320 B-97
Batch ID: P315588

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

Reference Method: SM 2320 B-97
Batch ID: P315673

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

Reference Method: SM 4500 F-C-97
Batch ID: P315593

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.4		P	91 - 105

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P315676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.3		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P315408

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

Reference Method: SM 5310 B-00
Batch ID: P315410

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P315644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1849923	Iron	103	103	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P315644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1849923	Arsenic	107	106	P/P	70 - 130
1849923	Cadmium	100	99.3	P/P	70 - 130
1849923	Chromium	93.4	92.2	P/P	70 - 130
1849923	Lead	104	105	P/P	70 - 130
1849923	Silver	95.5	96.6	P/P	70 - 130
1849923	Zinc	96.0	95.7	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316456

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1849922	Copper	83.2		P	70 - 130
1850586	Copper	89.5	92.1	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316064

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851195	Chloride	101		P	90 - 110
1851196	Chloride	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316065

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1849598	Chloride	100		P	90 - 110
1851137	Chloride	95.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316067

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851195	Sulfate	97.1		P	90 - 110
1851196	Sulfate	96.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1854429	Sulfate	107		P	90 - 110
1854432	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315789

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851121	Ammonia-N	101	98.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315959

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852239	Ammonia-N	95.7	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316148

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851218	Kjeldahl Nitrogen	104	110	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851481	Kjeldahl Nitrogen	93.0	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315842

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851119	NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315916

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851090	NO2NO3-N	106	104	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851086	Total-P	91.4	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851139	Total-P	93.2	93.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315386

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851001	O-Phosphate-P	99.1	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851141	O-Phosphate-P	99.7	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P315593

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1849998	Fluoride	97.2	97.9	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P315676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851136	Fluoride	100	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P315408

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850840	Organic Carbon	97.2	99.7	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P315410

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850709	Organic Carbon	98.0	99.2	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P315420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851131	Turbidity	0.259	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P315644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1849923	Iron	0.375	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P315644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1849923	Arsenic	0.770	Spike	P	0 - 20
1849923	Cadmium	0.987	Spike	P	0 - 20
1849923	Chromium	1.26	Spike	P	0 - 20
1849923	Lead	0.497	Spike	P	0 - 20
1849923	Silver	1.24	Spike	P	0 - 20
1849923	Zinc	0.292	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P316456

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850586	Copper	2.82	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316064

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851195	Chloride	0.112	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316065

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1849598	Chloride	0.0783	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851195	Sulfate	1.53	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1854432	Sulfate	0.466	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315789

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851121	Ammonia-N	2.27	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315959

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852239	Ammonia-N	2.94	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851218	Kjeldahl Nitrogen	4.52	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851481	Kjeldahl Nitrogen	12.6	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315842

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851119	NO2NO3-N	0.438	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315916

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851090	NO2NO3-N	0.952	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851086	Total-P	5.82	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851139	Total-P	0.220	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315386

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851001	O-Phosphate-P	1.75	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851141	O-Phosphate-P	1.49	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P315395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851130	Color (true)	0.514	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P315588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851165	Total Alkalinity	0.00218	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P315673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851136	Total Alkalinity	0.452	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P316004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851136	TDS	1.09	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P315593

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1849998	Fluoride	0.494	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P315676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851136	Fluoride	0.494	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P315408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850840	Organic Carbon	2.45	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P315410

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850709	Organic Carbon	0.832	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: A72868
Included Lab Sample IDs: 1851163, 1851164, 1851167

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: A72873
Included Lab Sample IDs: 1851159, 1851160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	85 - 115

Reference Method: SM 5310 B-00
Run ID: A72882
Included Lab Sample IDs: 1851161, 1851162, 1851166

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	101	102	P/P	90 - 110
Organic Carbon	100	102	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A72884
Included Lab Sample IDs: 1851159, 1851160, 1851165

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A72956
Included Lab Sample IDs: 1851165

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

Reference Method: SM 4500 F-C-97
Run ID: A72956
Included Lab Sample IDs: 1851165

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

Reference Method: SM 2320 B-97
Run ID: A72982
Included Lab Sample IDs: 1851159, 1851160

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

Reference Method: SM 4500 F-C-97
Run ID: A72982
Included Lab Sample IDs: 1851159, 1851160

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A73006
Included Lab Sample IDs: 1851171

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.9	99.8	P/P	90 - 110
Cadmium	96.1	96.4	P/P	90 - 110
Chromium	93.2	92.7	P/P	90 - 110
Lead	96.1	95.8	P/P	90 - 110
Silver	98.2	98.5	P/P	90 - 110
Zinc	99.1	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A73030
Included Lab Sample IDs: 1851161, 1851162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	P/P	90 - 110
Ammonia-N	98.8	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A73031
Included Lab Sample IDs: 1851171

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A73050
Included Lab Sample IDs: 1851161, 1851162

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A73081
Included Lab Sample IDs: 1851166

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	96.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A73098
Included Lab Sample IDs: 1851166

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A73099
Included Lab Sample IDs: 1851162

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A73115
Included Lab Sample IDs: 1851161, 1851166

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A73131
Included Lab Sample IDs: 1851159, 1851160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	102	P/P	90 - 110
Chloride	102	98.9	P/P	90 - 110
Sulfate	105	108	P/P	90 - 110
Sulfate	95.6	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A73208
Included Lab Sample IDs: 1851161, 1851162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.5	98.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73221

Included Lab Sample IDs: 1851166

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A73273

Included Lab Sample IDs: 1851171

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	101	97.9	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					0.259	
EPA 200.7 Rev. 4.4	Iron	105	103	103			0.375
EPA 200.8 Rev. 5.4	Arsenic	98.6	107	106			0.770
	Cadmium	99.8	100	99.3			0.987
	Chromium	104	93.4	92.2			1.26
	Copper	97.9	89.5	92.1	83.2		2.82
	Lead	100	104	105			0.497
	Silver	99.5	95.5	96.6			1.24
	Zinc	101	96.0	95.7			0.292
EPA 300.0 Rev. 2.1	Chloride	101	101	101		0.112	
	Chloride	101	100	95.4		0.0783	
	Sulfate	96.4	97.1	96.7		1.53	
	Sulfate	101	104	107		0.466	
EPA 350.1 Rev. 2.0	Ammonia-N	100	101	98.9			2.27
	Ammonia-N	98.6	95.7	101			2.94
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	104	110			4.52
	Kjeldahl Nitrogen	103	93.0	108			12.6
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	104	103			0.438
	NO ₂ NO ₃ -N	101	106	104			0.952
EPA 365.1 Rev. 2.0	Total-P	105	91.4	97.0			5.82
	Total-P	101	93.2	93.4			0.220
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	99.1	101			1.75
	O-Phosphate-P	102	99.7	101			1.49
SM 2120 B	Color (true)					0.514	
SM 2320 B-97	Total Alkalinity	102				0.0021	
	Total Alkalinity	102				0.452	
SM 2540 C-97	TDS					1.09	
SM 4500 F-C-97	Fluoride	94.4	97.2	97.9			0.494
	Fluoride	97.3	100	101			0.494
SM 5310 B-00	Organic Carbon	103	97.2	99.7			2.45
	Organic Carbon	101	98.0	99.2			0.832

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1851159, 1851160, 1851165
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1851171
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1851171
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1851159, 1851160
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1851159, 1851160, 1851165
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1851161, 1851162, 1851166
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1851161, 1851162, 1851166
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1851161, 1851162, 1851166
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1851161, 1851162, 1851166
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1851163, 1851164, 1851167
SM 2120 B / E31780	True Color measured at 450 nm	1851159, 1851160
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1851159, 1851160, 1851165
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1851159, 1851160
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1851159, 1851160, 1851165
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1851159, 1851160, 1851165
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1851161, 1851162, 1851166

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	11/17/2016			11/17/2016 16:41	Sima Feizi	1851159, 1851160, 1851165
EPA 200.7 Rev. 4.4	11/17/2016	11/22/2016	Elliott D. Healy	11/28/2016	Joshua Ayres	1851171
EPA 200.8 Rev. 5.4	11/17/2016	11/22/2016	Elliott D. Healy	11/24/2016	Charles J. Peterson	1851171
	11/17/2016	12/08/2016	Elliott D. Healy	12/09/2016	Robert K Palmer	1851171
EPA 300.0 Rev. 2.1	11/17/2016			12/02/2016	Ping Hua	1851159
	11/17/2016			12/03/2016	Ping Hua	1851160, 1851165
EPA 350.1 Rev. 2.0	11/17/2016			11/28/2016	Sofia Elnemr	1851161, 1851162
	11/17/2016			11/30/2016	Sofia Elnemr	1851166
EPA 351.2 Rev. 2.0	11/17/2016	12/05/2016	Martin Acosta	12/06/2016	Joseph Suarez	1851161, 1851162
	11/17/2016	12/06/2016	Adrian Shelby	12/07/2016	Joseph Suarez	1851166
EPA 353.2 Rev. 2.0	11/17/2016			11/29/2016	Beverly Y. Sanders	1851161, 1851162
	11/17/2016			11/30/2016	Beverly Y. Sanders	1851166
EPA 365.1 Rev. 2.0	11/17/2016	11/30/2016	Adrian Shelby	11/30/2016	Lipi Saha	1851162
	11/17/2016	11/30/2016	Adrian Shelby	12/01/2016	Lipi Saha	1851161, 1851166
EPA 365.1 Rev. 2.0 dissolved	11/17/2016			11/17/2016 15:38	Julia Storbeck	1851163
	11/17/2016			11/17/2016 15:39	Julia Storbeck	1851164
	11/17/2016			11/17/2016 15:44	Julia Storbeck	1851167
SM 2120 B	11/17/2016			11/17/2016 16:14	Jared I. Manley	1851159
	11/17/2016			11/17/2016 16:15	Jared I. Manley	1851160
SM 2320 B-97	11/17/2016			11/21/2016	Dale L. Simmons	1851165
	11/17/2016			11/23/2016	Dale L. Simmons	1851159, 1851160
SM 2540 C-97	11/17/2016			11/21/2016	Sima Feizi	1851159, 1851160
SM 2540 D-97	11/17/2016			11/21/2016	Sima Feizi	1851159, 1851160, 1851165
SM 4500 F-C-97	11/17/2016			11/21/2016	Dale L. Simmons	1851165
	11/17/2016			11/23/2016	Dale L. Simmons	1851159, 1851160
SM 5310 B-00	11/17/2016			11/17/2016	Julie Michelle Frank	1851161, 1851162
	11/17/2016			11/18/2016	Julie Michelle Frank	1851166