

Chemical Analysis Report

SO-DIST-2016-11-10-01

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

Event Description: **SMP: Florida Keys**
Request ID: **RQ-2016-11-07-15**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
Attn: Ben Paswater

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Certified by: Colin Wright, Environmental Administrator

Date Certified: 05-DEC-2016 11:44

A handwritten signature in black ink, appearing to read "Colin Wright", is written 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: 8073 #2

Collection Date/Time: 11/09/2016 13:00

Field ID: G5SD0063

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848940	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P315004	
	SM 2320 B-97	Total Alkalinity	120		mg CaCO3/L	P315211	
	SM 2540 D-97	TSS	8	I	mg/L	P315561	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P315214	
1848946	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P315452	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.50		mg N/L	P315654	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P315370	
	EPA 365.1 Rev. 2.0	Total-P	0.006	I	mg P/L	P315309	MS
	SM 5310 B-00	Organic Carbon	2.3		mg C/L	P315486	
1848952	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315016	
1848964	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P315165	
	EPA 200.8 Rev. 5.4	Arsenic	1.69		ug/L	P315165	
		Cadmium	0.060	U	ug/L	P315165	
		Chromium	0.15	U	ug/L	P315165	
		Copper	0.30	U	ug/L	P315165	
		Lead	0.25	U	ug/L	P315165	
		Nickel	0.15	U	ug/L	P315165	
		Silver	0.015	U	ug/L	P315165	
		Zinc	3.0	U	ug/L	P315165	

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: 8073 #3 ENRG6

Collection Date/Time: 11/09/2016 12:30

Field ID: G5SD0064

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848941	EPA 180.1 Rev. 2.0	Turbidity	0.25		NTU	P315004	
	SM 2320 B-97	Total Alkalinity	122		mg CaCO3/L	P315211	
	SM 2540 D-97	TSS	5	I	mg/L	P315561	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P315214	
1848947	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P315452	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29	I	mg N/L	P315654	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P315370	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P315309	MS
	SM 5310 B-00	Organic Carbon	1.4	I	mg C/L	P315486	
1848953	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315016	
1848965	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P315165	
	EPA 200.8 Rev. 5.4	Arsenic	1.92		ug/L	P315165	
		Cadmium	0.060	U	ug/L	P315165	
		Chromium	0.15	U	ug/L	P315165	
		Copper	0.30	U	ug/L	P315165	
		Lead	0.25	U	ug/L	P315165	
		Nickel	0.15	U	ug/L	P315165	
		Silver	0.015	U	ug/L	P315165	

Field ID: G5SD0064

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848965	EPA 200.8 Rev. 5.4	Zinc	3.0	U	ug/L	P315165	

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: 8073 #4 ENRG2

Collection Date/Time: 11/09/2016 10:10

Field ID: G5SD0065

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848942	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P315004	
	SM 2320 B-97	Total Alkalinity	121		mg CaCO3/L	P315211	
	SM 2540 D-97	TSS	4	I	mg/L	P315561	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P315214	
1848948	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P315452	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P315654	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P315370	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P315309	MS
	SM 5310 B-00	Organic Carbon	2.6		mg C/L	P315486	
1848954	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315016	
1848966	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P315165	
	EPA 200.8 Rev. 5.4	Arsenic	1.77		ug/L	P315165	
		Cadmium	0.060	U	ug/L	P315165	
		Chromium	0.15	U	ug/L	P315165	
		Copper	0.30	U	ug/L	P315165	
		Lead	0.25	U	ug/L	P315165	
		Nickel	0.17	I	ug/L	P315165	
		Silver	0.015	U	ug/L	P315165	
		Zinc	4.2	I	ug/L	P315165	

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: 8079-ENRG3 South of Stock Island

Collection Date/Time: 11/09/2016 11:20

Field ID: G5SD0067

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848943	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P315004	
	SM 2320 B-97	Total Alkalinity	121		mg CaCO3/L	P315211	
	SM 2540 D-97	TSS	4	I	mg/L	P315561	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P315214	
1848949	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P315452	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.43		mg N/L	P315654	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P315370	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P315309	MS
	SM 5310 B-00	Organic Carbon	2.1		mg C/L	P315486	
1848955	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315016	
1848967	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P315165	
	EPA 200.8 Rev. 5.4	Arsenic	1.92		ug/L	P315165	

Field ID: G5SD0067

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848967	EPA 200.8 Rev. 5.4	Cadmium	0.060	U	ug/L	P315165	
		Chromium	0.15	U	ug/L	P315165	
		Copper	0.30	U	ug/L	P315165	
		Lead	0.25	U	ug/L	P315165	
		Nickel	0.19	I	ug/L	P315165	
		Silver	0.015	U	ug/L	P315165	
		Zinc	5.2	I	ug/L	P315165	

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: 8079-ENRG6 Out by Reef

Collection Date/Time: 11/09/2016 11:55

Field ID: G5SD0068

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848944	EPA 180.1 Rev. 2.0	Turbidity	0.40		NTU	P315004	
	SM 2320 B-97	Total Alkalinity	121		mg CaCO3/L	P315211	
	SM 2540 D-97	TSS	4	I	mg/L	P315561	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P315214	
1848950	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P315452	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.34	I	mg N/L	P315654	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P315370	
	EPA 365.1 Rev. 2.0	Total-P	0.005	I	mg P/L	P315309	MS
	SM 5310 B-00	Organic Carbon	1.4	I	mg C/L	P315486	
1848956	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315016	
1848968	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P315165	
	EPA 200.8 Rev. 5.4	Arsenic	1.82		ug/L	P315165	
		Cadmium	0.060	U	ug/L	P315165	
		Chromium	0.15	U	ug/L	P315165	
		Copper	0.30	U	ug/L	P315165	
		Lead	0.25	U	ug/L	P315165	
		Nickel	0.15	U	ug/L	P315165	
		Silver	0.015	U	ug/L	P315165	
		Zinc	3.0	U	ug/L	P315165	

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: 8080-ENRG3 Nearshore

Collection Date/Time: 11/09/2016 16:10

Field ID: G5SD0070

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848945	EPA 180.1 Rev. 2.0	Turbidity	1.1	A	NTU	P315005	
	SM 2320 B-97	Total Alkalinity	123		mg CaCO3/L	P315211	
	SM 2540 D-97	TSS	3	U	mg/L	P315561	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P315214	
1848951	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P315452	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P315654	

Field ID: G5SD0070

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848951	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P315370	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P315331	MS
	SM 5310 B-00	Organic Carbon	1.9	I	mg C/L	P315486	
1848957	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315016	
1848969	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P315165	
	EPA 200.8 Rev. 5.4	Arsenic	1.78		ug/L	P315165	
		Cadmium	0.060	U	ug/L	P315165	
		Chromium	0.15	U	ug/L	P315165	
		Copper	0.30	U	ug/L	P315165	
		Lead	0.25	U	ug/L	P315165	
		Nickel	0.18	I	ug/L	P315165	
		Silver	0.015	U	ug/L	P315165	
		Zinc	5.0	I	ug/L	P315165	

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: P315004

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P315005

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P315165

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P315165

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L
Zinc	1.0	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315452

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315654

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315370

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315309

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315331

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315016

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

Reference Method: SM 2320 B-97
Batch ID: P315211

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

Reference Method: SM 2540 D-97
Batch ID: P315561

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P315214

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: P315486

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: P315165

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P315165

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.0		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	98.0		P	85 - 115
Copper	96.8		P	85 - 115
Lead	95.8		P	85 - 115
Nickel	97.5		P	85 - 115
Silver	96.9		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315452

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315654

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315370

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315309

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P315331

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P315016

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

Reference Method: SM 2320 B-97

Batch ID: P315211

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	95 - 108

Reference Method: SM 4500 F-C-97

Batch ID: P315214

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Reference Method: SM 5310 B-00

Batch ID: P315486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P315165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848965	Iron	100	101	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P315165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848965	Arsenic	100	102	P/P	70 - 130
1848965	Cadmium	87.6	90.3	P/P	70 - 130
1848965	Chromium	76.1	75.6	P/P	70 - 130
1848965	Copper	93.3	95.4	P/P	70 - 130
1848965	Lead	107	108	P/P	70 - 130
1848965	Nickel	98.8	101	P/P	70 - 130
1848965	Silver	87.1	88.2	P/P	70 - 130
1848965	Zinc	87.5	89.5	P/P	70 - 130

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315452

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848946	Ammonia-N	103	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315654

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848950	Kjeldahl Nitrogen	94.3	94.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315370

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848293	NO2NO3-N	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315309

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1847899	Total-P	82.8	86.4	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1849010	Total-P	85.3	84.2	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315016

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848954	O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P315214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848673	Fluoride	97.8	100	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P315486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848946	Organic Carbon	90.8	90.6	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P315004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848915	Turbidity	1.55	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P315005

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848945	Turbidity	5.61	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P315165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848965	Iron	0.618	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P315165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848965	Arsenic	1.98	Spike	P	0 - 20
1848965	Cadmium	3.04	Spike	P	0 - 20
1848965	Chromium	0.733	Spike	P	0 - 20
1848965	Copper	2.15	Spike	P	0 - 20
1848965	Lead	0.552	Spike	P	0 - 20
1848965	Nickel	2.53	Spike	P	0 - 20
1848965	Silver	1.25	Spike	P	0 - 20
1848965	Zinc	2.28	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848946	Ammonia-N	0.0786	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848950	Kjeldahl Nitrogen	0.192	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848293	NO2NO3-N	0.477	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1847899	Total-P	3.98	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1849010	Total-P	1.21	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315016

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848954	O-Phosphate-P	1.09	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P315211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848673	Total Alkalinity	0.499	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P315214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848673	Fluoride	1.52	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P315486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848946	Organic Carbon	0.208	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: A72761
Included Lab Sample IDs: 1848940, 1848941, 1848942, 1848943, 1848944, 1848945

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A72763

Included Lab Sample IDs: 1848952, 1848953, 1848954, 1848955, 1848956, 1848957

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.8	P/P	90 - 110
O-Phosphate-P	101	100	P/P	90 - 110
O-Phosphate-P	101	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A72821

Included Lab Sample IDs: 1848940, 1848941, 1848942, 1848943, 1848944, 1848945

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

Reference Method: SM 4500 F-C-97

Run ID: A72821

Included Lab Sample IDs: 1848940, 1848941, 1848942, 1848943, 1848944, 1848945

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.5	P/P	90 - 110
Fluoride	99.5	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A72859

Included Lab Sample IDs: 1848946, 1848947, 1848948, 1848949, 1848950, 1848951

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A72877

Included Lab Sample IDs: 1848964, 1848965, 1848966, 1848967, 1848968, 1848969

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A72889

Included Lab Sample IDs: 1848964, 1848965, 1848966, 1848967, 1848968, 1848969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	103	P/P	90 - 110
Arsenic	103	103	P/P	90 - 110
Cadmium	101	99.5	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Chromium	95.6	92.4	P/P	90 - 110
Chromium	99.9	95.6	P/P	90 - 110
Copper	99.0	99.4	P/P	90 - 110
Copper	99.1	99.0	P/P	90 - 110
Nickel	100	100	P/P	90 - 110
Nickel	99.5	100	P/P	90 - 110
Silver	97.1	96.4	P/P	90 - 110
Silver	98.0	97.1	P/P	90 - 110
Zinc	108	107	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A72889

Included Lab Sample IDs: 1848964, 1848965, 1848966, 1848967, 1848968, 1848969

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	109	108	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A72892

Included Lab Sample IDs: 1848946, 1848947, 1848948, 1848949, 1848950, 1848951

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

Reference Method: SM 5310 B-00

Run ID: A72907

Included Lab Sample IDs: 1848946, 1848947, 1848948, 1848949, 1848950, 1848951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72933

Included Lab Sample IDs: 1848946, 1848947, 1848948, 1848949, 1848950, 1848951

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A72965

Included Lab Sample IDs: 1848964, 1848965, 1848966, 1848967, 1848968, 1848969

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73042

Included Lab Sample IDs: 1848946, 1848947, 1848948, 1848949, 1848950, 1848951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	99.0	P/P	90 - 110
Kjeldahl Nitrogen	104	93.0	P/P	90 - 110
Kjeldahl Nitrogen	99.4	104	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
EPA 180.1 Rev. 2.0	Turbidity				1.55	
	Turbidity				5.61	
EPA 200.7 Rev. 4.4	Iron	103	100	101		0.618
EPA 200.8 Rev. 5.4	Arsenic	99.0	100	102		1.98
	Cadmium	101	87.6	90.3		3.04
	Chromium	98.0	76.1	75.6		0.733
	Copper	96.8	93.3	95.4		2.15
	Lead	95.8	107	108		0.552
	Nickel	97.5	98.8	101		2.53
	Silver	96.9	87.1	88.2		1.25
	Zinc	100	87.5	89.5		2.28
EPA 350.1 Rev. 2.0	Ammonia-N	103	103	103		0.0786
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	94.3	94.5		0.192
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	103	105	104		0.477
EPA 365.1 Rev. 2.0	Total-P	97.0	82.8	86.4		3.98
	Total-P	93.4	85.3	84.2		1.21
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	100	101		1.09
SM 2320 B-97	Total Alkalinity	100			0.499	
SM 4500 F-C-97	Fluoride	98.2	97.8	100		1.52
SM 5310 B-00	Organic Carbon	93.4	90.8	90.6		0.208

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1848940, 1848941, 1848942, 1848943, 1848944, 1848945
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1848964, 1848965, 1848966, 1848967, 1848968, 1848969
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1848964, 1848965, 1848966, 1848967, 1848968, 1848969
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1848946, 1848947, 1848948, 1848949, 1848950, 1848951
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1848946, 1848947, 1848948, 1848949, 1848950, 1848951
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1848946, 1848947, 1848948, 1848949, 1848950, 1848951
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1848946, 1848947, 1848948, 1848949, 1848950, 1848951
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1848952, 1848953, 1848954, 1848955, 1848956, 1848957
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1848940, 1848941, 1848942, 1848943, 1848944, 1848945
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1848940, 1848941, 1848942, 1848943, 1848944, 1848945
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1848940, 1848941, 1848942, 1848943, 1848944, 1848945
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1848946, 1848947, 1848948, 1848949, 1848950, 1848951

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	11/10/2016			11/10/2016 14:16	Sima Feizi	1848940, 1848941, 1848942, 1848943, 1848944, 1848945
EPA 200.7 Rev. 4.4	11/10/2016	11/15/2016	Elliott D. Healy	11/17/2016	Joshua Ayres	1848964, 1848965, 1848966, 1848967, 1848968, 1848969
EPA 200.8 Rev. 5.4	11/10/2016	11/15/2016	Elliott D. Healy	11/17/2016	Charles J. Peterson	1848964, 1848965, 1848966, 1848967, 1848968, 1848969
	11/10/2016	11/15/2016	Elliott D. Healy	11/21/2016	Charles J. Peterson	1848964, 1848965
	11/10/2016	11/15/2016	Elliott D. Healy	11/22/2016	Charles J. Peterson	1848966, 1848967, 1848968, 1848969
EPA 350.1 Rev. 2.0	11/10/2016			11/17/2016	Sofia Elnemr	1848946, 1848947, 1848948, 1848949, 1848950, 1848951
EPA 351.2 Rev. 2.0	11/10/2016	11/23/2016	Adrian Shelby	11/29/2016	Joseph Suarez	1848946, 1848947, 1848948, 1848949, 1848950, 1848951
EPA 353.2 Rev. 2.0	11/10/2016			11/17/2016	Beverly Y. Sanders	1848946, 1848947, 1848948, 1848949, 1848950, 1848951
EPA 365.1 Rev. 2.0	11/10/2016	11/17/2016	Christopher Armour	11/21/2016	Lipi Saha	1848946, 1848947, 1848948, 1848949, 1848950, 1848951
EPA 365.1 Rev. 2.0 dissolved	11/10/2016			11/10/2016 15:09	Julia Storbeck	1848954
	11/10/2016			11/10/2016 15:34	Julia Storbeck	1848952
	11/10/2016			11/10/2016 15:35	Julia Storbeck	1848953
	11/10/2016			11/10/2016 15:36	Julia Storbeck	1848955
	11/10/2016			11/10/2016 15:37	Julia Storbeck	1848956
	11/10/2016			11/10/2016 15:42	Julia Storbeck	1848957
SM 2320 B-97	11/10/2016			11/15/2016	Dale L. Simmons	1848940, 1848941, 1848942, 1848943, 1848944, 1848945
SM 2540 D-97	11/10/2016			11/14/2016	Sima Feizi	1848940, 1848941, 1848942, 1848943, 1848944, 1848945
SM 4500 F-C-97	11/10/2016			11/15/2016	Dale L. Simmons	1848940, 1848941, 1848942, 1848943, 1848944, 1848945
SM 5310 B-00	11/10/2016			11/19/2016	Julie Michelle Frank	1848946, 1848947, 1848948, 1848949, 1848950, 1848951