

Chemical Analysis Report

SO-DIST-2016-09-28-02

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-2016-09-26-14**
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
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 25-OCT-2016 10:33



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 #1 South of Ft. Zach

Collection Date/Time: 09/27/2016 15:00

Field ID: G5SD0062

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1835784	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P312082	
	SM 2320 B-97	Total Alkalinity	112		mg CaCO3/L	P312271	
	SM 2540 D-97	TSS	3	U	mg/L	P312758	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P312275	
1835788	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P312501	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.23	I	mg N/L	P312779	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P312700	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P312910	
	SM 5310 B-00	Organic Carbon	1.8	I	mg C/L	P312466	
1835792	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312075	
1835800	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P312024	
	EPA 200.8 Rev. 5.4	Arsenic	1.82		ug/L	P312024	
		Cadmium	0.060	U	ug/L	P312024	
		Chromium	0.15	U	ug/L	P312024	
		Copper	0.30	U	ug/L	P312024	
		Lead	0.25	U	ug/L	P312024	
		Nickel	0.17	I	ug/L	P312024	
		Silver	0.015	U	ug/L	P312024	
		Zinc	3.0	U	ug/L	P312024	

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 #2

Collection Date/Time: 09/27/2016 15:20

Field ID: G5SD0063

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1835785	EPA 180.1 Rev. 2.0	Turbidity	0.60		NTU	P312082	
	SM 2320 B-97	Total Alkalinity	115		mg CaCO3/L	P312271	
	SM 2540 D-97	TSS	3	U	mg/L	P312758	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P312275	
1835789	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P312501	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24	I	mg N/L	P312779	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P312700	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P312910	
	SM 5310 B-00	Organic Carbon	2.4		mg C/L	P312548	
1835793	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312075	
1835801	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P312024	
	EPA 200.8 Rev. 5.4	Arsenic	1.83		ug/L	P312024	
		Cadmium	0.060	U	ug/L	P312024	
		Chromium	0.15	U	ug/L	P312024	
		Copper	0.30	U	ug/L	P312024	
		Lead	0.25	U	ug/L	P312024	
		Nickel	0.19	I	ug/L	P312024	
		Silver	0.015	U	ug/L	P312024	

Field ID: G5SD0063

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1835801	EPA 200.8 Rev. 5.4	Zinc	3.0	U	ug/L	P312024	

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: 09/27/2016 14:30

Field ID: G5SD0065

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1835786	EPA 180.1 Rev. 2.0	Turbidity	0.60		NTU	P312082	
	SM 2320 B-97	Total Alkalinity	117		mg CaCO3/L	P312271	
	SM 2540 D-97	TSS	3	U	mg/L	P312758	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P312275	
1835790	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P312900	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P312779	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P312700	
	EPA 365.1 Rev. 2.0	Total-P	0.009	I	mg P/L	P312910	
	SM 5310 B-00	Organic Carbon	2.0	I	mg C/L	P312548	
1835794	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P312075	
1835802	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P312024	
	EPA 200.8 Rev. 5.4	Arsenic	1.95		ug/L	P312024	
		Cadmium	0.060	U	ug/L	P312024	
		Chromium	0.18	I	ug/L	P312024	
		Copper	0.30	U	ug/L	P312024	
		Lead	0.25	U	ug/L	P312024	
		Nickel	0.16	I	ug/L	P312024	
		Silver	0.015	U	ug/L	P312024	
		Zinc	3.0	U	ug/L	P312024	

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#5 ENRG1

Collection Date/Time: 09/27/2016 14:00

Field ID: G5SD0066

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1835787	EPA 180.1 Rev. 2.0	Turbidity	0.70	A	NTU	P312083	
	SM 2320 B-97	Total Alkalinity	113		mg CaCO3/L	P312271	
	SM 2540 D-97	TSS	3	U	mg/L	P312758	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P312275	
1835791	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P312900	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27	I	mg N/L	P312779	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P312700	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P312910	
	SM 5310 B-00	Organic Carbon	2.5		mg C/L	P312548	
1835795	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P312075	
1835803	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P312024	
	EPA 200.8 Rev. 5.4	Arsenic	1.80		ug/L	P312024	

Field ID: G5SD0066

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1835803	EPA 200.8 Rev. 5.4	Cadmium	0.060	U	ug/L	P312024	
		Chromium	0.15	U	ug/L	P312024	
		Copper	0.30	U	ug/L	P312024	
		Lead	0.25	U	ug/L	P312024	
		Nickel	0.17	I	ug/L	P312024	
		Silver	0.015	U	ug/L	P312024	
		Zinc	4.3	I	ug/L	P312024	

Ref. Method and Comment:
EPA 180.1 Rev. 2.0: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
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: P312082

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P312083

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P312024

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P312024

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312501

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312900

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312779

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312700

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312910

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312075

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

Reference Method: SM 2320 B-97
Batch ID: P312271

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

Reference Method: SM 2540 D-97
Batch ID: P312758

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P312275

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P312466

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

Quality Assurance Report Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P312548

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: P312024

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P312024

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	98.4		P	85 - 115
Chromium	99.5		P	85 - 115
Copper	94.4		P	85 - 115
Lead	95.2		P	85 - 115
Nickel	94.9		P	85 - 115
Silver	94.9		P	85 - 115
Zinc	96.6		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312501

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312900

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312779

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312700

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312910

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312075

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

Reference Method: SM 2320 B-97
Batch ID: P312271

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P312275

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P312466

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.0		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P312548

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P312024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834515	Iron	108	108	P/P	70 - 130
1834785	Iron	103		P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P312024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834515	Arsenic	104	105	P/P	70 - 130
1834515	Cadmium	95.6	98.5	P/P	70 - 130
1834515	Chromium	94.7	95.5	P/P	70 - 130
1834515	Copper	91.3	94.0	P/P	70 - 130
1834515	Lead	99.4	99.1	P/P	70 - 130

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P312024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834515	Nickel	92.1	95.3	P/P	70 - 130
1834515	Silver	90.6	92.1	P/P	70 - 130
1834515	Zinc	95.6	97.1	P/P	70 - 130
1834785	Arsenic	101		P	70 - 130
1834785	Cadmium	87.7		P	70 - 130
1834785	Chromium	79.2		P	70 - 130
1834785	Copper	89.5		P	70 - 130
1834785	Lead	104		P	70 - 130
1834785	Nickel	91.6		P	70 - 130
1834785	Silver	84.1		P	70 - 130
1834785	Zinc	81.7		P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312501

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835553	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835656	Ammonia-N	95.3	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312779

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835788	Kjeldahl Nitrogen	98.4	94.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312700

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1834498	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835788	Total-P	90.1	91.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835052	O-Phosphate-P	97.7	98.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P312275

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

Reference Method: SM 4500 F-C-97
Batch ID: P312275

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835048	Fluoride	96.7	98.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P312466

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835380	Organic Carbon	96.2	91.6	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P312548

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1835789	Organic Carbon	95.9	97.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P312082

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835606	Turbidity	2.38	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P312024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834515	Iron	0.154	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P312024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834515	Arsenic	0.381	Spike	P	0 - 20
1834515	Cadmium	3.07	Spike	P	0 - 20
1834515	Chromium	0.868	Spike	P	0 - 20
1834515	Copper	2.86	Spike	P	0 - 20
1834515	Lead	0.340	Spike	P	0 - 20
1834515	Nickel	3.27	Spike	P	0 - 20
1834515	Silver	1.66	Spike	P	0 - 20
1834515	Zinc	1.64	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312501

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835553	Ammonia-N	0.141	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P312900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835656	Ammonia-N	2.23	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P312779

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835788	Kjeldahl Nitrogen	3.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P312700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1834498	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P312910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835788	Total-P	1.16	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P312075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835052	O-Phosphate-P	0.563	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P312271

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835048	Total Alkalinity	0.0309	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P312275

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835048	Fluoride	0.946	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P312466

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835380	Organic Carbon	3.98	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P312548

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1835789	Organic Carbon	1.12	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: A71901
Included Lab Sample IDs: 1835792, 1835793, 1835794, 1835795

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	101	P/P	90 - 110
O-Phosphate-P	99.9	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71903
Included Lab Sample IDs: 1835784, 1835785, 1835786, 1835787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.0	P/P	95 - 105
Turbidity	99.0	100	P/P	95 - 105

Reference Method: SM 2320 B-97
Run ID: A71961
Included Lab Sample IDs: 1835784, 1835785, 1835786, 1835787

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: A71961
Included Lab Sample IDs: 1835784, 1835785, 1835786, 1835787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	99.5	P/P	90 - 110
Fluoride	99.5	99.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A71966
Included Lab Sample IDs: 1835800, 1835801, 1835802, 1835803

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A71985

Included Lab Sample IDs: 1835800, 1835801, 1835802, 1835803

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	103	P/P	90 - 110
Arsenic	99.9	101	P/P	90 - 110
Cadmium	96.0	96.5	P/P	90 - 110
Cadmium	96.9	96.0	P/P	90 - 110
Chromium	94.1	94.1	P/P	90 - 110
Chromium	99.6	94.1	P/P	90 - 110
Copper	95.0	98.2	P/P	90 - 110
Copper	98.2	99.3	P/P	90 - 110
Nickel	94.8	99.1	P/P	90 - 110
Nickel	99.1	99.8	P/P	90 - 110
Silver	96.0	97.1	P/P	90 - 110
Silver	97.1	96.0	P/P	90 - 110
Zinc	97.2	98.7	P/P	90 - 110
Zinc	98.7	99.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A72019

Included Lab Sample IDs: 1835800, 1835801, 1835802, 1835803

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	94.8	93.9	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A72021

Included Lab Sample IDs: 1835788

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A72029

Included Lab Sample IDs: 1835788, 1835789

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

Reference Method: SM 5310 B-00

Run ID: A72041

Included Lab Sample IDs: 1835789, 1835790, 1835791

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	106	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A72083

Included Lab Sample IDs: 1835788, 1835789, 1835790, 1835791

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A72156

Included Lab Sample IDs: 1835790, 1835791

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.1	P/P	90 - 110
Ammonia-N	99.1	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72178

Included Lab Sample IDs: 1835788, 1835789, 1835790, 1835791

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	P/P	90 - 110
Total-P	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A72188

Included Lab Sample IDs: 1835788, 1835789, 1835790, 1835791

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.0	99.6	P/P	90 - 110
Kjeldahl Nitrogen	99.6	98.7	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						2.38	
EPA 200.7 Rev. 4.4	Iron	106	108	108	103			0.154
EPA 200.8 Rev. 5.4	Arsenic	100	104	105	101			0.381
	Cadmium	98.4	95.6	98.5	87.7			3.07
	Chromium	99.5	94.7	95.5	79.2			0.868
	Copper	94.4	91.3	94.0	89.5			2.86
	Lead	95.2	99.4	99.1	104			0.340
	Nickel	94.9	92.1	95.3	91.6			3.27
	Silver	94.9	90.6	92.1	84.1			1.66
	Zinc	96.6	95.6	97.1	81.7			1.64
EPA 350.1 Rev. 2.0	Ammonia-N	105	102	102				0.141
	Ammonia-N	101	95.3	98.5				2.23
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	98.4	94.3				3.94
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102				0.0
EPA 365.1 Rev. 2.0	Total-P	96.7	90.1	91.2				1.16
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	97.7	98.3				0.563
SM 2320 B-97	Total Alkalinity	104					0.0309	
SM 4500 F-C-97	Fluoride	97.5	96.7	98.0				0.946
SM 5310 B-00	Organic Carbon	99.0	96.2	91.6				3.98
	Organic Carbon	105	95.9	97.0				1.12

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1835784, 1835785, 1835786, 1835787
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1835800, 1835801, 1835802, 1835803
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1835800, 1835801, 1835802, 1835803
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1835788, 1835789, 1835790, 1835791
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1835788, 1835789, 1835790, 1835791
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1835788, 1835789, 1835790, 1835791
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1835788, 1835789, 1835790, 1835791
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1835792, 1835793, 1835794, 1835795
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1835784, 1835785, 1835786, 1835787
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1835784, 1835785, 1835786, 1835787
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1835784, 1835785, 1835786, 1835787
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1835788, 1835789, 1835790, 1835791

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	09/28/2016			09/28/2016 16:47	Sima Feizi	1835784, 1835785, 1835786, 1835787
EPA 200.7 Rev. 4.4	09/28/2016	09/28/2016	Elliott D. Healy	09/30/2016	Joshua Ayres	1835800, 1835801, 1835802, 1835803
EPA 200.8 Rev. 5.4	09/28/2016	09/28/2016	Elliott D. Healy	10/04/2016	Charles J. Peterson	1835800, 1835801, 1835802, 1835803
EPA 350.1 Rev. 2.0	09/28/2016			10/04/2016	Sofia Elnemr	1835788, 1835789
	09/28/2016			10/07/2016	Sofia Elnemr	1835790, 1835791
EPA 351.2 Rev. 2.0	09/28/2016	10/10/2016	Adrian Shelby	10/12/2016	Joseph Suarez	1835788, 1835789, 1835790, 1835791
EPA 353.2 Rev. 2.0	09/28/2016			10/07/2016	Beverly Y. Sanders	1835788, 1835789, 1835790, 1835791
EPA 365.1 Rev. 2.0	09/28/2016	10/11/2016	Vijayalakshmi Reddy	10/12/2016	Lipi Saha	1835788, 1835789, 1835790, 1835791
EPA 365.1 Rev. 2.0 dissolved	09/28/2016			09/28/2016 17:59	Julia Storbeck	1835792
	09/28/2016			09/28/2016 18:04	Julia Storbeck	1835793
	09/28/2016			09/28/2016 18:05	Julia Storbeck	1835794, 1835795
SM 2320 B-97	09/28/2016			09/30/2016	Dale L. Simmons	1835784, 1835785, 1835786, 1835787
SM 2540 D-97	09/28/2016			10/03/2016	Yijie Li	1835784, 1835785, 1835786, 1835787
SM 4500 F-C-97	09/28/2016			09/30/2016	Dale L. Simmons	1835784, 1835785, 1835786, 1835787
SM 5310 B-00	09/28/2016			10/05/2016	Julie Michelle Frank	1835788, 1835789, 1835790, 1835791