

Chemical Analysis Report

SO-DIST-2017-05-31-01

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

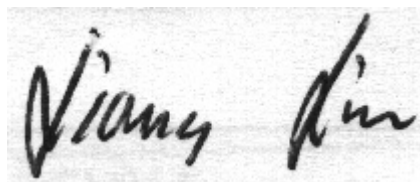
Event Description: **SMP: Florida Keys**
Request ID: **RQ-2017-05-29-32**
Customer: **SO-DIST**
Project ID: **SMP**

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: Liang Lin, Environmental Administrator

Date Certified: 23-JUN-2017 12:09

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

Case Narrative

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

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

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

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

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

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

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

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

Precision is reported as relative percent difference unless otherwise noted.

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

QC Codes used in this report may include:

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

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

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

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

Sample Location: 8080 @ ENRG3 Nearshore #2

Collection Date/Time: 05/30/2017 15:20

Field ID: G5SD053017-16

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1902326	EPA 180.1 Rev. 2.0	Turbidity	0.65		NTU	P326051	
	SM 2320 B-97	Total Alkalinity	111		mg CaCO3/L	P326144	
	SM 2540 D-97	TSS	3	U	mg/L	P326615	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P326145	
1902330	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P326127	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25	I	mg N/L	P326058	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P326087	
	EPA 365.1 Rev. 2.0	Total-P	0.01	I	mg P/L	P326063	
	SM 5310 B-00	Organic Carbon	1.9	I	mg C/L	P326193	
1902334	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P326039	
1902342	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P326226	
	EPA 200.8 Rev. 5.4	Arsenic	2.74		ug/L	P326226	
		Cadmium	0.080	U	ug/L	P326226	
		Chromium	1.6	U	ug/L	P326226	
		Copper	0.80	U	ug/L	P326226	
		Lead	0.35	U	ug/L	P326226	
		Nickel	0.80	U	ug/L	P326226	
		Silver	0.040	U	ug/L	P326226	
		Zinc	4.0	U	ug/L	P326226	

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 #1

Collection Date/Time: 05/30/2017 15:10

Field ID: G5SD053017-15

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1902327	EPA 180.1 Rev. 2.0	Turbidity	0.50		NTU	P326051	
	SM 2320 B-97	Total Alkalinity	112		mg CaCO3/L	P326144	
	SM 2540 D-97	TSS	3	U	mg/L	P326615	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P326145	
1902331	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P326127	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32	I	mg N/L	P326058	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P326087	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P326063	
	SM 5310 B-00	Organic Carbon	1.9	I	mg C/L	P326193	
1902335	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P326039	
1902343	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P326226	
	EPA 200.8 Rev. 5.4	Arsenic	2.75		ug/L	P326226	
		Cadmium	0.080	U	ug/L	P326226	
		Chromium	1.6	U	ug/L	P326226	
		Copper	0.80	U	ug/L	P326226	
		Lead	0.35	U	ug/L	P326226	
		Nickel	0.80	U	ug/L	P326226	
		Silver	0.040	U	ug/L	P326226	

Field ID: G5SD053017-15

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1902343	EPA 200.8 Rev. 5.4	Zinc	7.5	I	ug/L	P326226	

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 @ ENRG6 Out by Reef #2

Collection Date/Time: 05/30/2017 13:50

Field ID: G5SD053017-14

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1902328	EPA 180.1 Rev. 2.0	Turbidity	0.50		NTU	P326051	
	SM 2320 B-97	Total Alkalinity	112		mg CaCO3/L	P326144	
	SM 2540 D-97	TSS	3	U	mg/L	P326615	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P326145	
1902332	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P326127	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32	I	mg N/L	P326058	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P326087	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P326063	
	SM 5310 B-00	Organic Carbon	2.1		mg C/L	P326193	
1902336	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P326039	
1902344	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P326226	
	EPA 200.8 Rev. 5.4	Arsenic	2.71		ug/L	P326226	
		Cadmium	0.080	U	ug/L	P326226	
		Chromium	1.6	U	ug/L	P326226	
		Copper	0.80	U	ug/L	P326226	
		Lead	0.35	U	ug/L	P326226	
		Nickel	0.80	U	ug/L	P326226	
		Silver	0.040	U	ug/L	P326226	
		Zinc	4.2	I	ug/L	P326226	

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 @ ENRG6 Out by Reef #1

Collection Date/Time: 05/30/2017 16:00

Field ID: G5SD053017-13

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1902329	EPA 180.1 Rev. 2.0	Turbidity	0.35		NTU	P326051	
	SM 2320 B-97	Total Alkalinity	114		mg CaCO3/L	P326144	
	SM 2540 D-97	TSS	3	U	mg/L	P326615	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P326145	
1902333	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P326127	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27	I	mg N/L	P326058	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P326205	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P326138	
	SM 5310 B-00	Organic Carbon	1.8	I	mg C/L	P326193	
1902337	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P326040	
1902345	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P326226	
	EPA 200.8 Rev. 5.4	Arsenic	2.62		ug/L	P326226	

Field ID: G5SD053017-13

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1902345	EPA 200.8 Rev. 5.4	Cadmium	0.080	U	ug/L	P326226	
		Chromium	1.6	U	ug/L	P326226	
		Copper	0.80	U	ug/L	P326226	
		Lead	0.35	U	ug/L	P326226	
		Nickel	0.80	U	ug/L	P326226	
		Silver	0.040	U	ug/L	P326226	
		Zinc	5.2	I	ug/L	P326226	

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: P326051

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326226

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326226

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L
Zinc	1.0	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326127

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326058

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326087

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326087

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326205

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326063

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326138

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326039

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326040

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

Reference Method: SM 2320 B-97
Batch ID: P326144

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

Reference Method: SM 2540 D-97
Batch ID: P326615

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P326145

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: P326193

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: P326226

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326226

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.9		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	100		P	85 - 115
Copper	97.5		P	85 - 115
Lead	97.7		P	85 - 115
Nickel	98.5		P	85 - 115
Silver	99.2		P	85 - 115
Zinc	99.6		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326127

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: P326058

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326087

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326205

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: P326063

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326138

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326039

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326040

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

Reference Method: SM 2320 B-97
Batch ID: P326144

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

Reference Method: SM 4500 F-C-97
Batch ID: P326145

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	93.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P326193

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326226

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902438	Iron	102	102	P/P	70 - 130
1903254	Iron	97.6		P	70 - 130

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326226

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902438	Arsenic	108	109	P/P	70 - 130
1902438	Cadmium	100	101	P/P	70 - 130
1902438	Chromium	90.8	90.9	P/P	70 - 130
1902438	Copper	97.3	98.9	P/P	70 - 130
1902438	Lead	104	105	P/P	70 - 130
1902438	Nickel	104	105	P/P	70 - 130
1902438	Silver	96.3	95.5	P/P	70 - 130
1902438	Zinc	101	102	P/P	70 - 130
1903254	Arsenic	104		P	70 - 130
1903254	Cadmium	92.1		P	70 - 130
1903254	Chromium	84.7		P	70 - 130
1903254	Copper	99.1		P	70 - 130
1903254	Lead	108		P	70 - 130
1903254	Nickel	105		P	70 - 130
1903254	Silver	90.9		P	70 - 130
1903254	Zinc	88.5		P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326127

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1901230	Ammonia-N	108	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326058

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902330	Kjeldahl Nitrogen	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326087

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902272	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902485	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326063

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902273	Total-P	99.4	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326138

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902860	Total-P	91.0	91.3	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P326039

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902334	O-Phosphate-P	98.1	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P326040

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902391	O-Phosphate-P	95.5	93.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
 Batch ID: P326145

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902447	Fluoride	95.7	91.7	P/P	91 - 105

Reference Method: SM 5310 B-00
 Batch ID: P326193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1900849	Organic Carbon	97.8	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P326051

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902257	Turbidity	0.459	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P326226

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902438	Iron	0.255	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P326226

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902438	Arsenic	0.750	Spike	P	0 - 20
1902438	Cadmium	1.03	Spike	P	0 - 20
1902438	Chromium	0.0954	Spike	P	0 - 20
1902438	Copper	1.51	Spike	P	0 - 20
1902438	Lead	0.787	Spike	P	0 - 20
1902438	Nickel	0.285	Spike	P	0 - 20
1902438	Silver	0.768	Spike	P	0 - 20
1902438	Zinc	1.24	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326127

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1901230	Ammonia-N	0.236	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902330	Kjeldahl Nitrogen	1.06	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326087

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902272	NO2NO3-N	0.495	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902485	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326063

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902273	Total-P	1.41	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326138

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902860	Total-P	0.347	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326039

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902334	O-Phosphate-P	1.13	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326040

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902391	O-Phosphate-P	2.33	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P326144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902447	Total Alkalinity	0.0426	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P326145

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1902447	Fluoride	2.90	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P326193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1900849	Organic Carbon	1.25	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A76783
Included Lab Sample IDs: 1902334, 1902335, 1902336, 1902337

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A76787
Included Lab Sample IDs: 1902326, 1902327, 1902328, 1902329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	101	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A76797
Included Lab Sample IDs: 1902330, 1902331, 1902332

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A76815
Included Lab Sample IDs: 1902330, 1902331, 1902332, 1902333

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A76815

Included Lab Sample IDs: 1902330, 1902331, 1902332, 1902333

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

Reference Method: SM 2320 B-97

Run ID: A76819

Included Lab Sample IDs: 1902326, 1902327, 1902328, 1902329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A76819

Included Lab Sample IDs: 1902326, 1902327, 1902328, 1902329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	95.3	95.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A76829

Included Lab Sample IDs: 1902330, 1902331, 1902332

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.2	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A76846

Included Lab Sample IDs: 1902330, 1902331, 1902332, 1902333

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.6	96.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A76852

Included Lab Sample IDs: 1902333

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A76855

Included Lab Sample IDs: 1902333

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A76869

Included Lab Sample IDs: 1902330, 1902331, 1902332, 1902333

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	99.4	P/P	90 - 110
Kjeldahl Nitrogen	96.2	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A76869

Included Lab Sample IDs: 1902330, 1902331, 1902332, 1902333

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.4	99.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A76906

Included Lab Sample IDs: 1902342, 1902343, 1902344, 1902345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	99.5	97.8	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A77055

Included Lab Sample IDs: 1902342, 1902343, 1902344, 1902345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	97.2	98.7	P/P	90 - 110
Cadmium	99.5	97.2	P/P	90 - 110
Chromium	94.3	91.3	P/P	90 - 110
Chromium	99.5	94.3	P/P	90 - 110
Copper	102	98.0	P/P	90 - 110
Copper	98.4	102	P/P	90 - 110
Nickel	101	97.7	P/P	90 - 110
Nickel	97.6	101	P/P	90 - 110
Silver	98.2	98.3	P/P	90 - 110
Silver	98.3	98.8	P/P	90 - 110
Zinc	99.5	99.8	P/P	90 - 110
Zinc	99.8	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A77154

Included Lab Sample IDs: 1902342, 1902343, 1902344, 1902345

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.1	98.3	P/P	90 - 110
Lead	96.4	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			LCS	Precision	MS
			SMP					
EPA 180.1 Rev. 2.0	Turbidity						0.459	
EPA 200.7 Rev. 4.4	Iron	99.0	102	102	97.6			0.255
EPA 200.8 Rev. 5.4	Arsenic	97.9	108	109	104			0.750
	Cadmium	102	100	101	92.1			1.03
	Chromium	100	90.8	90.9	84.7			0.0954
	Copper	97.5	97.3	98.9	99.1			1.51

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.8 Rev. 5.4	Lead	97.7	104	105	108		0.787
	Nickel	98.5	104	105	105		0.285
	Silver	99.2	96.3	95.5	90.9		0.768
	Zinc	99.6	101	102	88.5		1.24
EPA 350.1 Rev. 2.0	Ammonia-N	103	108	108			0.236
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	101	102			1.06
EPA 353.2 Rev. 2.0	NO2NO3-N	103	101	101			0.495
	NO2NO3-N	102	104	104			0.0
EPA 365.1 Rev. 2.0	Total-P	100	99.4	98.0			1.41
	Total-P	103	91.0	91.3			0.347
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.2	98.1	97.0			1.13
	O-Phosphate-P	98.3	95.5	93.3			2.33
SM 2320 B-97	Total Alkalinity	103				0.0426	
SM 4500 F-C-97	Fluoride	93.2	95.7	91.7			2.90
SM 5310 B-00	Organic Carbon	97.2	97.8	96.4			1.25

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1902326, 1902327, 1902328, 1902329
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1902342, 1902343, 1902344, 1902345
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1902342, 1902343, 1902344, 1902345
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1902330, 1902331, 1902332, 1902333
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1902330, 1902331, 1902332, 1902333
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1902330, 1902331, 1902332, 1902333
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1902330, 1902331, 1902332, 1902333
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1902334, 1902335, 1902336, 1902337
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1902326, 1902327, 1902328, 1902329
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1902326, 1902327, 1902328, 1902329
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1902326, 1902327, 1902328, 1902329
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1902330, 1902331, 1902332, 1902333

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	05/31/2017			05/31/2017 17:24	Sima Feizi	1902326, 1902327, 1902328, 1902329
EPA 200.7 Rev. 4.4	05/31/2017	06/05/2017	Elliott D. Healy	06/06/2017	Betina Topolski	1902342, 1902343, 1902344, 1902345
EPA 200.8 Rev. 5.4	05/31/2017	06/05/2017	Elliott D. Healy	06/14/2017	Robert K Palmer	1902342, 1902343, 1902344, 1902345
	05/31/2017	06/05/2017	Elliott D. Healy	06/16/2017	Robert K Palmer	1902342, 1902343, 1902344, 1902345
EPA 350.1 Rev. 2.0	05/31/2017			06/01/2017	Julie Michelle Frank	1902330, 1902331, 1902332, 1902333
EPA 351.2 Rev. 2.0	05/31/2017	06/01/2017	Adrian Shelby	06/05/2017	Joseph Suarez	1902330, 1902331, 1902332, 1902333
EPA 353.2 Rev. 2.0	05/31/2017			06/01/2017	Beverly Y. Sanders	1902330, 1902331, 1902332
	05/31/2017			06/05/2017	Beverly Y. Sanders	1902333
EPA 365.1 Rev. 2.0	05/31/2017	06/01/2017	Adrian Shelby	06/02/2017	Lipi Saha	1902330, 1902331, 1902332
	05/31/2017	06/02/2017	Adrian Shelby	06/05/2017	Lipi Saha	1902333
EPA 365.1 Rev. 2.0 dissolved	05/31/2017			05/31/2017 14:04	Lipi Saha	1902334
	05/31/2017			05/31/2017 14:19	Lipi Saha	1902335
	05/31/2017			05/31/2017 14:20	Lipi Saha	1902336
	05/31/2017			05/31/2017 14:31	Lipi Saha	1902337
SM 2320 B-97	05/31/2017			06/01/2017	Dale L. Simmons	1902326, 1902327, 1902328, 1902329
SM 2540 D-97	05/31/2017			06/02/2017	Yijie Li	1902326, 1902327, 1902328, 1902329
SM 4500 F-C-97	05/31/2017			06/01/2017	Dale L. Simmons	1902326, 1902327, 1902328, 1902329
SM 5310 B-00	05/31/2017			06/03/2017	Julie Michelle Frank	1902330, 1902331, 1902332, 1902333