

Chemical Analysis Report

SO-DIST-2017-08-31-01

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

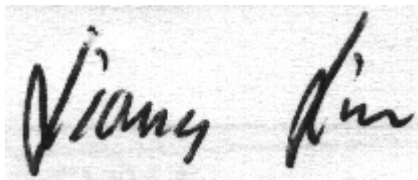
Event Description: **SMP: Florida Keys #9**
Request ID: **RQ-2017-08-28-43**
Customer: **SO-DIST**
Project ID: **SMP**

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: 22-SEP-2017 14:33

A handwritten signature in black ink, appearing to read "Liang Lin", 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: 8079 @ ENRG3 NEARSHORE #2

Collection Date/Time: 08/30/2017 12:00

Field ID: G5SD083017-5

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926625	EPA 180.1 Rev. 2.0	Turbidity	0.55		NTU	P331153	
	SM 2320 B-97	Total Alkalinity	117		mg CaCO3/L	P331302	
	SM 2540 D-97	TSS	3	U	mg/L	P331314	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P331303	
1926633	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P331291	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31	I	mg N/L	P331162	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P331417	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P331194	MS
	SM 5310 B-00	Organic Carbon	1.6	I	mg C/L	P331337	
1926641	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P331140	
1926678	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P331265	
	EPA 200.8 Rev. 5.4	Arsenic	1.8	I	ug/L	P331265	
		Cadmium	0.15	U	ug/L	P331265	
		Chromium	0.90	U	ug/L	P331265	
		Copper	1.5	U	ug/L	P331265	
		Lead	0.60	U	ug/L	P331265	
		Nickel	0.75	U	ug/L	P331265	
		Silver	0.075	U	ug/L	P331265	
		Zinc	15	U	ug/L	P331265	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: 8079 @ ENRG6 OUT BY REEF #1

Collection Date/Time: 08/30/2017 12:40

Field ID: G5SD083017-6

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926626	EPA 180.1 Rev. 2.0	Turbidity	0.25		NTU	P331153	
	SM 2320 B-97	Total Alkalinity	119		mg CaCO3/L	P331302	
	SM 2540 D-97	TSS	3	U	mg/L	P331314	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P331303	
1926634	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P331291	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25	I	mg N/L	P331162	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P331417	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P331194	MS
	SM 5310 B-00	Organic Carbon	1.7	I	mg C/L	P331337	
1926642	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P331140	
1926679	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P331265	
	EPA 200.8 Rev. 5.4	Arsenic	1.6	I	ug/L	P331265	
		Cadmium	0.15	U	ug/L	P331265	
		Chromium	0.90	U	ug/L	P331265	
		Copper	1.5	U	ug/L	P331265	
		Lead	0.60	U	ug/L	P331265	
		Nickel	0.75	U	ug/L	P331265	

Field ID: G5SD083017-6

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926679	EPA 200.8 Rev. 5.4	Silver	0.075	U	ug/L	P331265	
		Zinc	15	U	ug/L	P331265	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: 8079 @ ENRG6 OUT BY REEF #2

Collection Date/Time: 08/30/2017 13:00

Field ID: G5SD083017-7

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926627	EPA 180.1 Rev. 2.0	Turbidity	0.30		NTU	P331153	
	SM 2320 B-97	Total Alkalinity	119		mg CaCO3/L	P331302	
	SM 2540 D-97	TSS	3	U	mg/L	P331314	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P331303	
1926635	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P331291	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25	I	mg N/L	P331162	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P331417	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P331194	MS
	SM 5310 B-00	Organic Carbon	1.2	I	mg C/L	P331337	
1926643	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P331140	
1926680	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P331265	
	EPA 200.8 Rev. 5.4	Arsenic	1.6	I	ug/L	P331265	
		Cadmium	0.15	U	ug/L	P331265	
		Chromium	0.90	U	ug/L	P331265	
		Copper	1.5	U	ug/L	P331265	
		Lead	0.60	U	ug/L	P331265	
		Nickel	0.75	U	ug/L	P331265	
		Silver	0.075	U	ug/L	P331265	
		Zinc	15	U	ug/L	P331265	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: 8079 @ ENRG6 OUT BY REEF #2 DUP

Collection Date/Time: 08/30/2017 13:35

Field ID: G5SD083017-8 DUP

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926628	EPA 180.1 Rev. 2.0	Turbidity	0.60		NTU	P331153	
	SM 2320 B-97	Total Alkalinity	118		mg CaCO3/L	P331302	
	SM 2540 D-97	TSS	3	U	mg/L	P331314	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P331303	
1926636	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P331291	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31	I	mg N/L	P331162	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P331417	
	EPA 365.1 Rev. 2.0	Total-P	0.006	I	mg P/L	P331194	MS
	SM 5310 B-00	Organic Carbon	1.2	I	mg C/L	P331337	

Field ID: G5SD083017-8 DUP

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926644	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P331140	
1926681	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P331265	
	EPA 200.8 Rev. 5.4	Arsenic	1.4	I	ug/L	P331265	
		Cadmium	0.15	U	ug/L	P331265	
		Chromium	0.90	U	ug/L	P331265	
		Copper	1.5	U	ug/L	P331265	
		Lead	0.60	U	ug/L	P331265	
		Nickel	0.75	U	ug/L	P331265	
		Silver	0.075	U	ug/L	P331265	
		Zinc	15	U	ug/L	P331265	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: 8073 @ ENRG4 W OF KEYWEST #2

Collection Date/Time: 08/30/2017 14:20

Field ID: G5SD083017-1

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926629	EPA 180.1 Rev. 2.0	Turbidity	0.40		NTU	P331153	
	SM 2320 B-97	Total Alkalinity	116	A	mg CaCO3/L	P331302	
	SM 2540 D-97	TSS	3	U	mg/L	P331314	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P331303	
1926637	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P331291	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.28	I	mg N/L	P331162	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P331417	
	EPA 365.1 Rev. 2.0	Total-P	0.007	IJ	mg P/L	P331194	MS
	SM 5310 B-00	Organic Carbon	1.8	I	mg C/L	P331337	
1926645	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P331140	
1926682	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P331265	
	EPA 200.8 Rev. 5.4	Arsenic	1.8	I	ug/L	P331265	
		Cadmium	0.15	U	ug/L	P331265	
		Chromium	0.90	U	ug/L	P331265	
		Copper	1.5	U	ug/L	P331265	
		Lead	0.60	U	ug/L	P331265	
		Nickel	0.75	U	ug/L	P331265	
		Silver	0.075	U	ug/L	P331265	
		Zinc	15	U	ug/L	P331265	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0: Total-P: Refer to the narrative for an explanation of QC Codes.

Sample Location: 8073 @ ENRG6 OUT BY REEF #1

Collection Date/Time: 08/30/2017 13:40

Field ID: G5SD083017-2

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926630	EPA 180.1 Rev. 2.0	Turbidity	0.40		NTU	P331153	

Field ID: G5SD083017-2

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926630	SM 2320 B-97	Total Alkalinity	119		mg CaCO3/L	P331302	
	SM 2540 D-97	TSS	3	U	mg/L	P331314	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P331303	
1926638	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P331291	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24	I	mg N/L	P331162	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P331417	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P331194	MS
	SM 5310 B-00	Organic Carbon	1.3	I	mg C/L	P331337	
1926646	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P331140	
1926683	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P331265	
	EPA 200.8 Rev. 5.4	Arsenic	1.6	I	ug/L	P331265	
		Cadmium	0.15	U	ug/L	P331265	
		Chromium	0.90	U	ug/L	P331265	
		Copper	1.5	U	ug/L	P331265	
		Lead	0.60	U	ug/L	P331265	
		Nickel	0.75	U	ug/L	P331265	
		Silver	0.075	U	ug/L	P331265	
		Zinc	15	U	ug/L	P331265	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: 8073 @ ENRG6 OUT BY REEF #2

Collection Date/Time: 08/30/2017 13:50

Field ID: G5SD083017-3

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926631	EPA 180.1 Rev. 2.0	Turbidity	0.45		NTU	P331153	
	SM 2320 B-97	Total Alkalinity	119		mg CaCO3/L	P331302	
	SM 2540 D-97	TSS	3	U	mg/L	P331314	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P331303	
1926639	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P331291	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29	I	mg N/L	P331162	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P331417	
	EPA 365.1 Rev. 2.0	Total-P	0.006	I	mg P/L	P331194	MS
	SM 5310 B-00	Organic Carbon	1.2	I	mg C/L	P331337	
1926647	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P331140	
1926684	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P331265	
	EPA 200.8 Rev. 5.4	Arsenic	1.6	I	ug/L	P331265	
		Cadmium	0.15	U	ug/L	P331265	
		Chromium	0.90	U	ug/L	P331265	
		Copper	1.5	U	ug/L	P331265	
		Lead	0.60	U	ug/L	P331265	
		Nickel	0.75	U	ug/L	P331265	
		Silver	0.075	U	ug/L	P331265	
		Zinc	15	U	ug/L	P331265	

Field ID: G5SD083017-3

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
Ref. Method and Comment: SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.							

Sample Location: 8079 @ ENRG3 S OF STOCK ISLAND

Collection Date/Time: 08/30/2017 15:10

Field ID: G5SD083017-4

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1926632	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P331153	
	SM 2320 B-97	Total Alkalinity	108		mg CaCO3/L	P331302	
	SM 2540 D-97	TSS	3	UA	mg/L	P331314	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P331303	
1926640	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P331291	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.44		mg N/L	P331162	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P331417	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P331194	MS
	SM 5310 B-00	Organic Carbon	2.1		mg C/L	P331337	
1926648	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.005	I	mg P/L	P331140	
	dissolved						
1926685	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P331265	
	EPA 200.8 Rev. 5.4	Arsenic	2.0	I	ug/L	P331265	
		Cadmium	0.15	U	ug/L	P331265	
		Chromium	0.90	U	ug/L	P331265	
		Copper	1.5	U	ug/L	P331265	
		Lead	0.60	U	ug/L	P331265	
		Nickel	0.75	U	ug/L	P331265	
		Silver	0.075	U	ug/L	P331265	
		Zinc	15	U	ug/L	P331265	

Ref. Method and Comment:
 SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
 EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P331153

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P331265

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P331265

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P331265

Component	Result	Code	Units
Arsenic	0.25	U	ug/L
Cadmium	0.050	U	ug/L
Chromium	0.30	U	ug/L
Copper	0.50	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.25	U	ug/L
Silver	0.025	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331291

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P331162

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P331417

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P331194

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P331140

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

Reference Method: SM 2320 B-97
Batch ID: P331302

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

Reference Method: SM 2540 D-97
Batch ID: P331314

Component	Result	Code	Units
TSS	3	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P331303

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P331337

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: P331265

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P331265

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.2		P	85 - 115
Cadmium	97.4		P	85 - 115
Chromium	96.4		P	85 - 115
Copper	93.9		P	85 - 115
Lead	96.5		P	85 - 115
Nickel	94.3		P	85 - 115
Silver	96.7		P	85 - 115
Zinc	94.5		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331291

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P331162

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P331417

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P331194

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P331140

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

Reference Method: SM 2320 B-97

Batch ID: P331302

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

Reference Method: SM 4500 F-C-97

Batch ID: P331303

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.9		P	92 - 103

Reference Method: SM 5310 B-00

Batch ID: P331337

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	104		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P331265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1926009	Iron	106	107	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P331265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1926009	Arsenic	106	107	P/P	70 - 130
1926009	Cadmium	88.8	106	P/P	70 - 130
1926009	Chromium	97.8	99.3	P/P	70 - 130
1926009	Copper	93.6	93.1	P/P	70 - 130
1926009	Lead	104	105	P/P	70 - 130
1926009	Nickel	93.1	92.6	P/P	70 - 130
1926009	Silver	95.9	95.1	P/P	70 - 130
1926009	Zinc	101	102	P/P	70 - 130

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P331162

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1926633	Kjeldahl Nitrogen	94.6	90.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P331417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1925933	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P331194

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1926637	Total-P	85.2	84.8	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P331140

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1926642	O-Phosphate-P	96.1	99.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P331303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1924375	Fluoride	96.2	97.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P331337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1926633	Organic Carbon	104	104	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P331153

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1926600	Turbidity	0.512	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P331265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1926009	Iron	1.07	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P331265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1926009	Arsenic	0.663	Spike	P	0 - 20
1926009	Cadmium	17.3	Spike	P	0 - 20
1926009	Chromium	1.48	Spike	P	0 - 20
1926009	Copper	0.448	Spike	P	0 - 20
1926009	Lead	0.902	Spike	P	0 - 20
1926009	Nickel	0.510	Spike	P	0 - 20
1926009	Silver	0.875	Spike	P	0 - 20
1926009	Zinc	1.42	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P331291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1925933	Ammonia-N	0.528	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P331162

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1926633	Kjeldahl Nitrogen	4.00	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P331417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1925933	NO2NO3-N	0.210	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P331194

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1926637	Total-P	0.500	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P331140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1926642	O-Phosphate-P	2.97	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P331302

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1926629	Total Alkalinity	0.292	Sample	P	0 - 4.8

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P331303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1924375	Fluoride	0.960	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P331337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1926633	Organic Carbon	0.139	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: A78735
Included Lab Sample IDs: 1926641, 1926642, 1926643, 1926644, 1926645, 1926646, 1926647, 1926648

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	102	102	P/P	90 - 110
O-Phosphate-P	102	105	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A78737
Included Lab Sample IDs: 1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A78782
Included Lab Sample IDs: 1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.0	97.5	P/P	90 - 110
Total-P	97.5	97.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A78792
Included Lab Sample IDs: 1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.5	P/P	90 - 110
Ammonia-N	98.8	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A78795

Included Lab Sample IDs: 1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.1	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A78795

Included Lab Sample IDs: 1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.0	P/P	90 - 110
Fluoride	99.0	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A78796

Included Lab Sample IDs: 1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	97.6	P/P	90 - 110
Kjeldahl Nitrogen	106	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A78811

Included Lab Sample IDs: 1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A78820

Included Lab Sample IDs: 1926678, 1926679, 1926680, 1926681, 1926682, 1926683, 1926684, 1926685

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A78844

Included Lab Sample IDs: 1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A78953

Included Lab Sample IDs: 1926678, 1926679, 1926680, 1926681, 1926682, 1926683, 1926684, 1926685

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.4	96.2	P/P	90 - 110
Arsenic	98.9	97.4	P/P	90 - 110
Cadmium	97.0	95.2	P/P	90 - 110
Cadmium	97.8	97.0	P/P	90 - 110
Chromium	98.0	96.3	P/P	90 - 110
Chromium	99.7	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A78953

Included Lab Sample IDs: 1926678, 1926679, 1926680, 1926681, 1926682, 1926683, 1926684, 1926685

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	95.2	93.9	P/P	90 - 110
Copper	98.5	95.2	P/P	90 - 110
Lead	98.6	97.3	P/P	90 - 110
Lead	99.5	98.6	P/P	90 - 110
Silver	97.2	95.9	P/P	90 - 110
Silver	98.8	97.2	P/P	90 - 110
Zinc	94.6	92.5	P/P	90 - 110
Zinc	99.1	94.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A78954

Included Lab Sample IDs: 1926678, 1926679, 1926680, 1926681, 1926682, 1926683, 1926684, 1926685

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	95.3	96.8	P/P	90 - 110
Nickel	98.2	95.3	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				0.512	
EPA 200.7 Rev. 4.4	Iron	104	106 107			1.07
EPA 200.8 Rev. 5.4	Arsenic	98.2	106 107			0.663
	Cadmium	97.4	88.8 106			17.3
	Chromium	96.4	97.8 99.3			1.48
	Copper	93.9	93.6 93.1			0.448
	Lead	96.5	104 105			0.902
	Nickel	94.3	93.1 92.6			0.510
	Silver	96.7	95.9 95.1			0.875
	Zinc	94.5	101 102			1.42
EPA 350.1 Rev. 2.0	Ammonia-N	98.3				0.528
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	94.6 90.4			4.00
EPA 353.2 Rev. 2.0	NO2NO3-N	103	102			0.210
EPA 365.1 Rev. 2.0	Total-P	93.8	85.2 84.8			0.500
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	96.1 99.0			2.97
SM 2320 B-97	Total Alkalinity	102			0.292	
SM 4500 F-C-97	Fluoride	95.9	96.2 97.7			0.960
SM 5310 B-00	Organic Carbon	104	104 104			0.139

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
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Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1926678, 1926679, 1926680, 1926681, 1926682, 1926683, 1926684, 1926685
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1926678, 1926679, 1926680, 1926681, 1926682, 1926683, 1926684, 1926685
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1926641, 1926642, 1926643, 1926644, 1926645, 1926646, 1926647, 1926648
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	08/31/2017			08/31/2017 15:53	DeAsia Armster	1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632
EPA 200.7 Rev. 4.4	08/31/2017	09/05/2017	Elliott D. Healy	09/06/2017	Betina Topolski	1926678, 1926679, 1926680, 1926681, 1926682, 1926683, 1926684, 1926685
EPA 200.8 Rev. 5.4	08/31/2017	09/05/2017	Elliott D. Healy	09/16/2017	Robert K Palmer	1926678, 1926679, 1926680, 1926681, 1926682, 1926683, 1926684, 1926685
	08/31/2017	09/05/2017	Elliott D. Healy	09/17/2017	Robert K Palmer	1926678, 1926679, 1926680, 1926681, 1926682, 1926683, 1926684, 1926685
EPA 350.1 Rev. 2.0	08/31/2017			09/05/2017	Sofia Elnemr	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640
EPA 351.2 Rev. 2.0	08/31/2017	09/01/2017	Adrian Shelby	09/06/2017	Joseph Suarez	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640
EPA 353.2 Rev. 2.0	08/31/2017			09/07/2017	Beverly Y. Sanders	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640
EPA 365.1 Rev. 2.0	08/31/2017	09/01/2017	Sima Feizi	09/05/2017	Lipi Saha	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640
EPA 365.1 Rev. 2.0 dissolved	08/31/2017			08/31/2017 14:00	Megan Treadwell	1926642
	08/31/2017			08/31/2017 14:21	Megan Treadwell	1926641, 1926643
	08/31/2017			08/31/2017 14:22	Megan Treadwell	1926644
	08/31/2017			08/31/2017 14:23	Megan Treadwell	1926645
	08/31/2017			08/31/2017 14:24	Megan Treadwell	1926646
	08/31/2017			08/31/2017 14:25	Megan Treadwell	1926647
	08/31/2017			08/31/2017 14:26	Megan Treadwell	1926648
SM 2320 B-97	08/31/2017			09/05/2017	Dale L. Simmons	1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632
SM 2540 D-97	08/31/2017			09/01/2017	DeAsia Armster	1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632
SM 4500 F-C-97	08/31/2017			09/05/2017	Dale L. Simmons	1926625, 1926626, 1926627, 1926628, 1926629, 1926630, 1926631, 1926632
SM 5310 B-00	08/31/2017			09/06/2017	Ping Hua	1926633, 1926634, 1926635, 1926636, 1926637, 1926638, 1926639, 1926640