

Chemical Analysis Report

SO-DIST-2017-06-29-02

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-2017-06-26-09**
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: 24-JUL-2017 11:05



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: 06/28/2017 09:45

Field ID: G5SD062817-1

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910078	EPA 180.1 Rev. 2.0	Turbidity	0.45		NTU	P327749	
	SM 2320 B-97	Total Alkalinity	112		mg CaCO3/L	P328070	
	SM 2540 D-97	TSS	4	I	mg/L	P328177	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P328069	
1910086	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P327894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26	I	mg N/L	P327885	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P327777	
	EPA 365.1 Rev. 2.0	Total-P	0.006	I	mg P/L	P327864	
	SM 5310 B-00	Organic Carbon	1.5	I	mg C/L	P328073	
1910094	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P327732	
1910116	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P327850	
	EPA 200.8 Rev. 5.4	Arsenic	1.8	I	ug/L	P327850	
		Cadmium	0.15	U	ug/L	P327850	
		Chromium	1.2	U	ug/L	P327850	
		Copper	1.5	U	ug/L	P327850	
		Lead	0.80	U	ug/L	P327850	
		Nickel	1.0	U	ug/L	P327850	
		Silver	0.10	U	ug/L	P327850	
		Zinc	20	U	ug/L	P327850	

Ref. Method and Comment:

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

Sample Location: 8079 @ ENRG6 Out by Reef #1

Collection Date/Time: 06/28/2017 10:30

Field ID: G5SD062817-10

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910079	EPA 180.1 Rev. 2.0	Turbidity	0.25		NTU	P327749	
	SM 2320 B-97	Total Alkalinity	121		mg CaCO3/L	P328070	
	SM 2540 D-97	TSS	4	I	mg/L	P328177	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P328069	
1910087	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P327894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P327885	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P327777	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P327864	
	SM 5310 B-00	Organic Carbon	1.0	I	mg C/L	P328073	
1910095	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P327732	
1910117	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P327850	
	EPA 200.8 Rev. 5.4	Arsenic	1.7	I	ug/L	P327850	
		Cadmium	0.15	U	ug/L	P327850	
		Chromium	1.2	U	ug/L	P327850	
		Copper	1.5	U	ug/L	P327850	
		Lead	0.80	U	ug/L	P327850	
		Nickel	1.4	I	ug/L	P327850	
		Silver	0.10	U	ug/L	P327850	

Field ID: G5SD062817-10

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910117	EPA 200.8 Rev. 5.4	Zinc	20	U	ug/L	P327850	

Ref. Method and Comment:

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

Sample Location: 8079 @ ENRG6 Out by Reef #2

Collection Date/Time: 06/28/2017 11:00

Field ID: G5SD062817-11

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910080	EPA 180.1 Rev. 2.0	Turbidity	0.30		NTU	P327749	
	SM 2320 B-97	Total Alkalinity	121		mg CaCO3/L	P328070	
	SM 2540 D-97	TSS	6	I	mg/L	P328177	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P328069	
1910088	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P327894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P327885	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P327777	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P327864	
	SM 5310 B-00	Organic Carbon	1.0	I	mg C/L	P328073	
1910096	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P327732	
1910118	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P327850	
	EPA 200.8 Rev. 5.4	Arsenic	1.5	I	ug/L	P327850	
		Cadmium	0.15	U	ug/L	P327850	
		Chromium	1.2	U	ug/L	P327850	
		Copper	1.5	U	ug/L	P327850	
		Lead	0.80	U	ug/L	P327850	
		Nickel	1.0	U	ug/L	P327850	
		Silver	0.10	U	ug/L	P327850	
		Zinc	20	U	ug/L	P327850	

Ref. Method and Comment:

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

Sample Location: 8079 @ ENRG3 S of Stock Island

Collection Date/Time: 06/28/2017 10:10

Field ID: G5SD062817-8

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910081	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P327749	
	SM 2320 B-97	Total Alkalinity	111		mg CaCO3/L	P328070	
	SM 2540 D-97	TSS	6	I	mg/L	P328177	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P328069	
1910089	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P327894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29	I	mg N/L	P327885	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P327777	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P327864	
	SM 5310 B-00	Organic Carbon	2.0	I	mg C/L	P328192	
1910097	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P327732	
1910119	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P327850	
	EPA 200.8 Rev. 5.4	Arsenic	1.8	I	ug/L	P327850	

Field ID: G5SD062817-8

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910119	EPA 200.8 Rev. 5.4	Cadmium	0.15	U	ug/L	P327850	
		Chromium	1.2	U	ug/L	P327850	
		Copper	1.5	U	ug/L	P327850	
		Lead	0.80	U	ug/L	P327850	
		Nickel	1.0	U	ug/L	P327850	
		Silver	0.10	U	ug/L	P327850	
		Zinc	20	U	ug/L	P327850	

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 @ ENRG1 N of Dredgers Key

Collection Date/Time: 06/28/2017 14:30

Field ID: G5SD062817-7

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910082	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P327750	
	SM 2320 B-97	Total Alkalinity	110		mg CaCO3/L	P328070	
	SM 2540 D-97	TSS	7	I	mg/L	P328177	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P328069	
1910090	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P327894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.35	I	mg N/L	P327885	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P327777	
	EPA 365.1 Rev. 2.0	Total-P	0.009	I	mg P/L	P327963	MS
	SM 5310 B-00	Organic Carbon	2.2		mg C/L	P328192	
1910098	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P327732	
1910120	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P327850	
	EPA 200.8 Rev. 5.4	Arsenic	2.0	I	ug/L	P327850	
		Cadmium	0.15	U	ug/L	P327850	
		Chromium	1.2	U	ug/L	P327850	
		Copper	1.5	U	ug/L	P327850	
		Lead	0.80	U	ug/L	P327850	
		Nickel	1.0	U	ug/L	P327850	
		Silver	0.10	U	ug/L	P327850	
		Zinc	20	U	ug/L	P327850	

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 @ ENRG2 Bayside #1

Collection Date/Time: 06/28/2017 13:50

Field ID: G5SD062817-5

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910083	EPA 180.1 Rev. 2.0	Turbidity	0.55		NTU	P327750	
	SM 2320 B-97	Total Alkalinity	115		mg CaCO3/L	P328070	
	SM 2540 D-97	TSS	3	U	mg/L	P328177	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P328069	
1910091	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P327894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.23	IJ	mg N/L	P327885	MS

Field ID: G5SD062817-5

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910091	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P327777	
	EPA 365.1 Rev. 2.0	Total-P	0.009	IJ	mg P/L	P327963	MS
	SM 5310 B-00	Organic Carbon	1.6	I	mg C/L	P328192	
1910099	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P327732	
1910121	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P327850	
	EPA 200.8 Rev. 5.4	Arsenic	1.7	I	ug/L	P327850	
		Cadmium	0.15	U	ug/L	P327850	
		Chromium	1.2	U	ug/L	P327850	
		Copper	1.5	U	ug/L	P327850	
		Lead	0.80	U	ug/L	P327850	
		Nickel	1.0	U	ug/L	P327850	
		Silver	0.10	U	ug/L	P327850	
		Zinc	20	U	ug/L	P327850	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Refer to the narrative for an explanation of QC Codes.

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

Sample Location: 8073 @ ENRG4 W of Keywest #1

Collection Date/Time: 06/28/2017 12:00

Field ID: G5SD062817-1

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910084	EPA 180.1 Rev. 2.0	Turbidity	0.30		NTU	P327750	
	SM 2320 B-97	Total Alkalinity	112		mg CaCO3/L	P328070	
	SM 2540 D-97	TSS	4	I	mg/L	P328177	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P328069	
1910092	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P327894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24	I	mg N/L	P327885	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P327777	
	EPA 365.1 Rev. 2.0	Total-P	0.006	I	mg P/L	P327963	MS
	SM 5310 B-00	Organic Carbon	1.5	I	mg C/L	P328192	
1910100	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P327732	
1910122	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P327850	
	EPA 200.8 Rev. 5.4	Arsenic	2.0	I	ug/L	P327850	
		Cadmium	0.15	U	ug/L	P327850	
		Chromium	1.2	U	ug/L	P327850	
		Copper	1.5	U	ug/L	P327850	
		Lead	0.80	U	ug/L	P327850	
		Nickel	1.0	U	ug/L	P327850	
		Silver	0.10	U	ug/L	P327850	
		Zinc	20	U	ug/L	P327850	

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 @ ENRG6 Out by Reef #1

Collection Date/Time: 06/28/2017 11:40

Field ID: G5SD062817-3

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1910085	EPA 180.1 Rev. 2.0	Turbidity	0.20		NTU	P327750	
	SM 2320 B-97	Total Alkalinity	122		mg CaCO3/L	P328070	
	SM 2540 D-97	TSS	6	I	mg/L	P328177	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P328069	
1910093	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P327894	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.36	I	mg N/L	P327885	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P327777	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P327963	MS
	SM 5310 B-00	Organic Carbon	1.0	U	mg C/L	P328192	
1910101	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P327732	
1910123	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P327850	
	EPA 200.8 Rev. 5.4	Arsenic	1.5	I	ug/L	P327850	
		Cadmium	0.15	U	ug/L	P327850	
		Chromium	1.2	U	ug/L	P327850	
		Copper	1.5	U	ug/L	P327850	
		Lead	0.80	U	ug/L	P327850	
		Nickel	1.0	U	ug/L	P327850	
		Silver	0.10	U	ug/L	P327850	
		Zinc	20	U	ug/L	P327850	

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: P327749

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P327750

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P327850

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P327850

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327850

Component	Result	Code	Units
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: P327894

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327885

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327777

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327864

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327963

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P327732

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

Reference Method: SM 2320 B-97
Batch ID: P328070

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

Reference Method: SM 2540 D-97
Batch ID: P328177

Component	Result	Code	Units
TSS	3	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P328069

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P328073

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

Reference Method: SM 5310 B-00
Batch ID: P328192

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: P327850

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327850

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.3		P	85 - 115
Cadmium	98.0		P	85 - 115
Chromium	102		P	85 - 115
Copper	102		P	85 - 115
Lead	102		P	85 - 115
Nickel	105		P	85 - 115
Silver	101		P	85 - 115
Zinc	97.6		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P327894

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	106		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327885

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.6		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327777

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327864

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P327732

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: P328070

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

Reference Method: SM 4500 F-C-97
Batch ID: P328069

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P328073

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P328192

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	91.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327850

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

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P327850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1910120	Iron	101	101	P/P	70 - 130
1910250	Iron	107		P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P327850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1910120	Arsenic	99.3	95.8	P/P	70 - 130
1910120	Cadmium	93.5	92.9	P/P	70 - 130
1910120	Chromium	106	105	P/P	70 - 130
1910120	Copper	91.4	91.0	P/P	70 - 130
1910120	Lead	108	106	P/P	70 - 130
1910120	Nickel	95.6	94.5	P/P	70 - 130
1910120	Silver	97.4	93.7	P/P	70 - 130
1910120	Zinc	80.0	86.7	P/P	70 - 130
1910250	Arsenic	101		P	70 - 130
1910250	Cadmium	105		P	70 - 130
1910250	Chromium	103		P	70 - 130
1910250	Copper	102		P	70 - 130
1910250	Lead	107		P	70 - 130
1910250	Nickel	92.5		P	70 - 130
1910250	Silver	96.3		P	70 - 130
1910250	Zinc	89.6		P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P327894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1910086	Ammonia-N	103	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P327885

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1910091	Kjeldahl Nitrogen	89.5	85.3	F/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P327777

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909935	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P327864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909541	Total-P	93.3	94.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P327963

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1910091	Total-P	89.8	85.9	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P327732

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909937	O-Phosphate-P	94.9	97.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P328069

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1910241	Fluoride	95.1	99.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P328073

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909348	Organic Carbon	91.6	96.8	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P328192

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1909935	Organic Carbon	93.2	92.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P327749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909991	Turbidity	2.60	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P327750

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1910160	Turbidity	4.82	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1910120	Iron	0.290	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1910120	Arsenic	3.40	Spike	P	0 - 20
1910120	Cadmium	0.593	Spike	P	0 - 20
1910120	Chromium	0.642	Spike	P	0 - 20
1910120	Copper	0.439	Spike	P	0 - 20
1910120	Lead	2.25	Spike	P	0 - 20
1910120	Nickel	1.10	Spike	P	0 - 20
1910120	Silver	3.80	Spike	P	0 - 20
1910120	Zinc	7.97	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P327894

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1910086	Ammonia-N	0.259	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327885

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1910091	Kjeldahl Nitrogen	4.29	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327777

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909935	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909541	Total-P	0.854	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P327963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1910091	Total-P	4.44	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P327732

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909937	O-Phosphate-P	2.60	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P328070

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1910241	Total Alkalinity	0.166	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P328069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1910241	Fluoride	2.92	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P328073

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909348	Organic Carbon	4.28	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P328192

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1909935	Organic Carbon	0.573	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: A77426
Included Lab Sample IDs: 1910094, 1910095, 1910096, 1910097, 1910098, 1910099, 1910100, 1910101

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.9	98.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A77435
Included Lab Sample IDs: 1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A77451
Included Lab Sample IDs: 1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093

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: A77506

Included Lab Sample IDs: 1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	99.8	P/P	90 - 110
Ammonia-N	99.8	99.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A77550

Included Lab Sample IDs: 1910116, 1910117, 1910118, 1910119, 1910120, 1910121, 1910122, 1910123

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

Reference Method: SM 2320 B-97

Run ID: A77557

Included Lab Sample IDs: 1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	104	P/P	90 - 110
Total Alkalinity	104	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A77557

Included Lab Sample IDs: 1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.0	97.6	P/P	90 - 110
Fluoride	97.6	98.5	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A77560

Included Lab Sample IDs: 1910086, 1910087, 1910088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	95.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A77565

Included Lab Sample IDs: 1910086, 1910087, 1910088, 1910089

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A77573

Included Lab Sample IDs: 1910090, 1910091, 1910092, 1910093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A77594

Included Lab Sample IDs: 1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.2	94.9	P/P	90 - 110
Kjeldahl Nitrogen	97.6	93.2	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A77612

Included Lab Sample IDs: 1910089, 1910090, 1910091, 1910092, 1910093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	90.8	91.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A77711

Included Lab Sample IDs: 1910116, 1910117, 1910118, 1910119, 1910120, 1910121, 1910122, 1910123

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.9	95.8	P/P	90 - 110
Arsenic	97.4	95.9	P/P	90 - 110
Cadmium	103	94.6	P/P	90 - 110
Cadmium	94.6	100	P/P	90 - 110
Chromium	97.7	98.0	P/P	90 - 110
Chromium	98.0	102	P/P	90 - 110
Copper	103	94.6	P/P	90 - 110
Copper	94.6	100	P/P	90 - 110
Lead	101	102	P/P	90 - 110
Lead	102	103	P/P	90 - 110
Nickel	100	98.5	P/P	90 - 110
Nickel	98.5	98.5	P/P	90 - 110
Silver	98.3	98.5	P/P	90 - 110
Silver	98.5	99.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A77732

Included Lab Sample IDs: 1910116, 1910117, 1910118, 1910119, 1910120, 1910121, 1910122, 1910123

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	102	91.8	P/P	90 - 110
Zinc	91.8	98.6	P/P	90 - 110

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

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

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					2.60	
	Turbidity					4.82	
EPA 200.7 Rev. 4.4	Iron	102	101	101	107		0.290

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.8 Rev. 5.4	Arsenic	99.3	101	99.3	95.8		3.40
	Cadmium	98.0	105	93.5	92.9		0.593
	Chromium	102	103	106	105		0.642
	Copper	102	102	91.4	91.0		0.439
	Lead	102	107	108	106		2.25
	Nickel	105	92.5	95.6	94.5		1.10
	Silver	101	96.3	97.4	93.7		3.80
	Zinc	97.6	89.6	80.0	86.7		7.97
EPA 350.1 Rev. 2.0	Ammonia-N	106	103	103			0.259
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.6	89.5	85.3			4.29
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100	100			0.0
EPA 365.1 Rev. 2.0	Total-P	98.6	93.3	94.1			0.854
	Total-P	98.2	89.8	85.9			4.44
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	94.9	97.4			2.60
SM 2320 B-97	Total Alkalinity	103				0.166	
SM 4500 F-C-97	Fluoride	96.1	95.1	99.5			2.92
SM 5310 B-00	Organic Carbon	100	91.6	96.8			4.28
	Organic Carbon	91.2	93.2	92.4			0.573

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1910116, 1910117, 1910118, 1910119, 1910120, 1910121, 1910122, 1910123
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1910116, 1910117, 1910118, 1910119, 1910120, 1910121, 1910122, 1910123
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1910094, 1910095, 1910096, 1910097, 1910098, 1910099, 1910100, 1910101
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093

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	06/29/2017			06/29/2017 16:54	DeAsia Armster	1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085
EPA 200.7 Rev. 4.4	06/29/2017	07/03/2017	Elliott D. Healy	07/06/2017	Betina Topolski	1910116, 1910117, 1910118, 1910119, 1910120, 1910121, 1910122, 1910123
EPA 200.8 Rev. 5.4	06/29/2017	07/03/2017	Elliott D. Healy	07/13/2017	Robert K Palmer	1910116, 1910117, 1910118, 1910119, 1910120, 1910121, 1910122, 1910123
	06/29/2017	07/03/2017	Elliott D. Healy	07/14/2017	Robert K Palmer	1910116, 1910117, 1910118, 1910119, 1910120, 1910121, 1910122, 1910123
EPA 350.1 Rev. 2.0	06/29/2017			07/03/2017	Sofia Elnemr	1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093
EPA 351.2 Rev. 2.0	06/29/2017	07/05/2017	Adrian Shelby	07/07/2017	Joseph Suarez	1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093
EPA 353.2 Rev. 2.0	06/29/2017			06/30/2017	Beverly Y. Sanders	1910086, 1910087, 1910088, 1910089, 1910090, 1910091, 1910092, 1910093
EPA 365.1 Rev. 2.0	06/29/2017	07/03/2017	Vijayalakshmi Reddy	07/06/2017	Lipi Saha	1910086, 1910087, 1910088, 1910089
	06/29/2017	07/06/2017	Adrian Shelby	07/07/2017	Lipi Saha	1910090, 1910091, 1910092, 1910093
EPA 365.1 Rev. 2.0 dissolved	06/29/2017			06/29/2017 12:01	Ping Hua	1910094, 1910095
	06/29/2017			06/29/2017 12:02	Ping Hua	1910096
	06/29/2017			06/29/2017 12:03	Ping Hua	1910097
	06/29/2017			06/29/2017 12:04	Ping Hua	1910098
	06/29/2017			06/29/2017 12:05	Ping Hua	1910099
	06/29/2017			06/29/2017 12:06	Ping Hua	1910100
	06/29/2017			06/29/2017 12:07	Ping Hua	1910101
SM 2320 B-97	06/29/2017			07/07/2017	Dale L. Simmons	1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085
SM 2540 D-97	06/29/2017			07/03/2017	Sima Feizi	1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085
SM 4500 F-C-97	06/29/2017			07/07/2017	Dale L. Simmons	1910078, 1910079, 1910080, 1910081, 1910082, 1910083, 1910084, 1910085
SM 5310 B-00	06/29/2017			07/06/2017	Ping Hua	1910086, 1910087, 1910088
	06/29/2017			07/08/2017	Ping Hua	1910089, 1910090, 1910091, 1910092, 1910093