

Chemical Analysis Report

SO-DIST-2017-01-11-01

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-2017-01-09-05**
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: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 01-FEB-2017 10:54



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: Indian Key Fill at SW End

Collection Date/Time: 01/10/2017 13:00

Field ID: G5SD0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1862971	EPA 180.1 Rev. 2.0	Turbidity	5.6		NTU	P318111	
	SM 2320 B-97	Total Alkalinity	124		mg CaCO3/L	P318492	
	SM 2540 D-97	TSS	13	A	mg/L	P318551	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P318707	
1862974	EPA 350.1 Rev. 2.0	Ammonia-N	0.052		mg N/L	P318209	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.30	I	mg N/L	P318194	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P318232	
	EPA 365.1 Rev. 2.0	Total-P	0.007	IJ	mg P/L	P318272	MS
	SM 5310 B-00	Organic Carbon	1.2	I	mg C/L	P318262	
1862977	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P318117	
1862983	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P318097	
	EPA 200.8 Rev. 5.4	Arsenic	1.5	I	ug/L	P318097	
		Cadmium	0.15	U	ug/L	P318097	
		Chromium	0.90	U	ug/L	P318097	
		Copper	1.5	U	ug/L	P318097	
		Lead	0.60	U	ug/L	P318097	
		Nickel	0.75	U	ug/L	P318097	
		Silver	0.075	U	ug/L	P318097	
		Zinc	15	U	ug/L	P318097	

Ref. Method and Comment:

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

Sample Location: Grassy Key @ Curry Hammock Creek

Collection Date/Time: 01/10/2017 13:45

Field ID: FLKEYS0022FTM

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1862972	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P318111	
	SM 2320 B-97	Total Alkalinity	141		mg CaCO3/L	P318492	
	SM 2540 D-97	TSS	11		mg/L	P318551	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P318496	
1862975	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P318209	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P318194	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P318232	
	EPA 365.1 Rev. 2.0	Total-P	0.01		mg P/L	P318272	MS
	SM 5310 B-00	Organic Carbon	3.5		mg C/L	P318262	
1862978	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P318117	
1862984	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P318097	
	EPA 200.8 Rev. 5.4	Arsenic	1.5	I	ug/L	P318097	
		Cadmium	0.15	U	ug/L	P318097	
		Chromium	0.90	U	ug/L	P318097	
		Copper	1.5	U	ug/L	P318097	
		Lead	0.60	U	ug/L	P318097	
		Nickel	0.75	U	ug/L	P318097	
		Silver	0.075	U	ug/L	P318097	

Field ID: FLKEYS0022FTM

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1862984	EPA 200.8 Rev. 5.4	Zinc	15	U	ug/L	P318097	

Sample Location: 6012C By Bridge No Name Key

Collection Date/Time: 01/10/2017 15:00

Field ID: G5SD0071

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1862973	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P318111	
	SM 2320 B-97	Total Alkalinity	129	A	mg CaCO3/L	P318492	
	SM 2540 D-97	TSS	4	I	mg/L	P318551	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P318496	
1862976	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P318211	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24	I	mg N/L	P318194	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P318232	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P318272	MS
	SM 5310 B-00	Organic Carbon	1.9	I	mg C/L	P318262	
1862979	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P318117	
1862985	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P318097	
	EPA 200.8 Rev. 5.4	Arsenic	1.1	I	ug/L	P318097	
		Cadmium	0.15	U	ug/L	P318097	
		Chromium	0.90	U	ug/L	P318097	
		Copper	1.5	U	ug/L	P318097	
		Lead	0.60	U	ug/L	P318097	
		Nickel	0.75	U	ug/L	P318097	
		Silver	0.075	U	ug/L	P318097	
		Zinc	15	U	ug/L	P318097	

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P318111

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P318097

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P318097

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: P318097

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: P318209

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318211

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318194

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318232

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318272

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318117

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

Reference Method: SM 2320 B-97
Batch ID: P318492

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

Reference Method: SM 2540 D-97
Batch ID: P318551

Component	Result	Code	Units
TSS	3	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P318496

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P318707

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P318262

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: P318097

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318097

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.9		P	80 - 120
Cadmium	97.0		P	80 - 120
Chromium	97.5		P	80 - 120
Copper	97.3		P	80 - 120
Lead	97.9		P	80 - 120
Nickel	90.3		P	80 - 120
Silver	93.8		P	80 - 120
Zinc	95.3		P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318209

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318211

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P318194

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: P318232

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P318272

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	92.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P318117

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

Reference Method: SM 2320 B-97
 Batch ID: P318492

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

Reference Method: SM 4500 F-C-97
 Batch ID: P318496

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.8		P	92 - 103

Reference Method: SM 4500 F-C-97
 Batch ID: P318707

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.9		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P318262

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P318097

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: P318097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861126	Iron	97.8		P	70 - 130
1861127	Iron	97.6	99.1	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1861126	Arsenic	96.2		P	70 - 130
1861126	Cadmium	90.9		P	70 - 130
1861126	Chromium	97.9		P	70 - 130
1861126	Copper	94.0		P	70 - 130
1861126	Lead	100		P	70 - 130
1861126	Nickel	85.1		P	70 - 130
1861126	Silver	88.8		P	70 - 130
1861126	Zinc	89.5		P	70 - 130
1861127	Arsenic	91.1	94.3	P/P	70 - 130
1861127	Cadmium	86.8	91.8	P/P	70 - 130
1861127	Chromium	91.0	94.3	P/P	70 - 130
1861127	Copper	89.3	91.9	P/P	70 - 130
1861127	Lead	95.7	97.6	P/P	70 - 130
1861127	Nickel	94.0	90.6	P/P	70 - 130
1861127	Silver	85.3	89.3	P/P	70 - 130
1861127	Zinc	84.1	86.6	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318209

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1862839	Ammonia-N	103	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1862976	Ammonia-N	101	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318194

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1863005	Kjeldahl Nitrogen	95.7	97.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318232

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1862913	NO2NO3-N	105	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318272

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: P318272

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1862974	Total-P	85.1	87.8	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318117

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1862977	O-Phosphate-P	101	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P318496

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1862973	Fluoride	93.6	94.3	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P318707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1864868	Fluoride	95.9	96.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P318262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1863020	Organic Carbon	103	100	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P318111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1862940	Turbidity	0.683	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P318097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861127	Iron	1.47	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861127	Arsenic	3.34	Spike	P	0 - 20
1861127	Cadmium	5.60	Spike	P	0 - 20
1861127	Chromium	3.56	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P318097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1861127	Copper	2.94	Spike	P	0 - 20
1861127	Lead	1.98	Spike	P	0 - 20
1861127	Nickel	3.68	Spike	P	0 - 20
1861127	Silver	4.58	Spike	P	0 - 20
1861127	Zinc	2.93	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318209

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1862839	Ammonia-N	2.33	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P318211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1862976	Ammonia-N	0.601	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P318194

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1863005	Kjeldahl Nitrogen	1.75	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P318232

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1862913	NO2NO3-N	1.37	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P318272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1862974	Total-P	3.05	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P318117

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1862977	O-Phosphate-P	0.395	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P318492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1862973	Total Alkalinity	0.358	Sample	P	0 - 4.8

Reference Method: SM 2540 D-97
Batch ID: P318551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1862971	TSS	6.06	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P318496

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1862973	Fluoride	0.483	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P318707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1864868	Fluoride	0.490	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P318262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1863020	Organic Carbon	2.39	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A73882
Included Lab Sample IDs: 1862971, 1862972, 1862973

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A73883
Included Lab Sample IDs: 1862977, 1862978, 1862979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.4	97.3	P/P	90 - 110
O-Phosphate-P	97.7	96.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A73894

Included Lab Sample IDs: 1862974, 1862975, 1862976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	96.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73916

Included Lab Sample IDs: 1862974, 1862975, 1862976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.8	95.8	P/P	90 - 110
Ammonia-N	99.1	99.4	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A73931

Included Lab Sample IDs: 1862974, 1862975, 1862976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.2	96.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A73932

Included Lab Sample IDs: 1862983, 1862984, 1862985

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.5	94.6	P/P	90 - 110
Cadmium	99.8	97.7	P/P	90 - 110
Chromium	100	97.1	P/P	90 - 110
Copper	95.5	93.0	P/P	90 - 110
Lead	97.7	95.0	P/P	90 - 110
Silver	97.1	95.9	P/P	90 - 110
Zinc	97.2	94.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A73935

Included Lab Sample IDs: 1862983, 1862984, 1862985

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	95.4	95.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73948

Included Lab Sample IDs: 1862974, 1862975, 1862976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	100	P/P	90 - 110
Kjeldahl Nitrogen	100	96.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A73953

Included Lab Sample IDs: 1862983, 1862984, 1862985

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	93.7	96.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73977

Included Lab Sample IDs: 1862974

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	95.5	97.0	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A74022

Included Lab Sample IDs: 1862971, 1862972, 1862973

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

Reference Method: SM 4500 F-C-97

Run ID: A74022

Included Lab Sample IDs: 1862972, 1862973

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A74055

Included Lab Sample IDs: 1862975, 1862976

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	98.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A74096

Included Lab Sample IDs: 1862971

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.5	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					0.683	
EPA 200.7 Rev. 4.4	Iron	101	97.8	97.6	99.1		1.47
EPA 200.8 Rev. 5.4	Arsenic	97.9	96.2	91.1	94.3		3.34
	Cadmium	97.0	90.9	86.8	91.8		5.60
	Chromium	97.5	97.9	91.0	94.3		3.56
	Copper	97.3	94.0	89.3	91.9		2.94
	Lead	97.9	100	95.7	97.6		1.98
	Nickel	90.3	85.1	94.0	90.6		3.68
	Silver	93.8	88.8	85.3	89.3		4.58
	Zinc	95.3	89.5	84.1	86.6		2.93

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
EPA 350.1 Rev. 2.0	Ammonia-N	101	103	106		2.33
	Ammonia-N	101	101	101		0.601
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	95.7	97.9		1.75
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	106	105	107		1.37
EPA 365.1 Rev. 2.0	Total-P	92.4	85.1	87.8		3.05
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	101	101		0.395
SM 2320 B-97	Total Alkalinity	103			0.358	
SM 2540 D-97	TSS				6.06	
SM 4500 F-C-97	Fluoride	97.8	93.6	94.3		0.483
	Fluoride	96.9	95.9	96.5		0.490
SM 5310 B-00	Organic Carbon	99.0	103	100		2.39

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1862971, 1862972, 1862973
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1862983, 1862984, 1862985
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1862983, 1862984, 1862985
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1862974, 1862975, 1862976
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1862974, 1862975, 1862976
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1862974, 1862975, 1862976
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1862974, 1862975, 1862976
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1862977, 1862978, 1862979
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1862971, 1862972, 1862973
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1862971, 1862972, 1862973
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1862971, 1862972, 1862973
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1862974, 1862975, 1862976

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	01/11/2017			01/11/2017 15:58	Sima Feizi	1862971, 1862972, 1862973
EPA 200.7 Rev. 4.4	01/11/2017	01/11/2017	Elliott D. Healy	01/13/2017	Joshua Ayres	1862983, 1862984, 1862985
EPA 200.8 Rev. 5.4	01/11/2017	01/11/2017	Elliott D. Healy	01/13/2017	Robert K Palmer	1862983, 1862984, 1862985
	01/11/2017	01/11/2017	Elliott D. Healy	01/17/2017	Robert K Palmer	1862983, 1862984, 1862985
EPA 350.1 Rev. 2.0	01/11/2017			01/12/2017	Sofia Elnemr	1862974, 1862975, 1862976
EPA 351.2 Rev. 2.0	01/11/2017	01/13/2017	Adrian Shelby	01/17/2017	Joseph Suarez	1862974, 1862975, 1862976
EPA 353.2 Rev. 2.0	01/11/2017			01/12/2017	Beverly Y. Sanders	1862974, 1862975, 1862976
EPA 365.1 Rev. 2.0	01/11/2017	01/17/2017	Vijayalakshmi Reddy	01/18/2017	Lipi Saha	1862974
	01/11/2017	01/17/2017	Vijayalakshmi Reddy	01/23/2017	Lipi Saha	1862975, 1862976
EPA 365.1 Rev. 2.0 dissolved	01/11/2017			01/11/2017 15:52	Julia Storbeck	1862977
	01/11/2017			01/11/2017 16:16	Julia Storbeck	1862978
	01/11/2017			01/11/2017 16:17	Julia Storbeck	1862979
SM 2320 B-97	01/11/2017			01/20/2017	Dale L. Simmons	1862971, 1862972, 1862973
SM 2540 D-97	01/11/2017			01/13/2017	Yijie Li	1862971, 1862972, 1862973
SM 4500 F-C-97	01/11/2017			01/20/2017	Dale L. Simmons	1862972, 1862973
	01/11/2017			01/25/2017	Dale L. Simmons	1862971
SM 5310 B-00	01/11/2017			01/13/2017	Julie Michelle Frank	1862974, 1862975, 1862976