Chemical Analysis Report

SO-DIST-2017-04-13-02

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

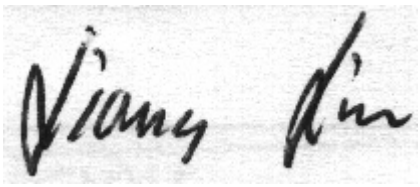
Event Description: **SMP: Florida Keys**
Request ID: **RQ-2017-04-03-26**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
Attn: Ben Paswater

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 10-MAY-2017 13:56



NON-CONFORMANCE REPORT INCLUDED

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 #5 ENRG1 **Collection Date/Time: 04/11/2017 11:30**

Field ID: G5SD041217-5 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888711	EPA 180.1 Rev. 2.0	Turbidity	0.90	Q	NTU	P323528	
	SM 2320 B-97	Total Alkalinity	120		mg CaCO3/L	P323536	
	SM 2540 D-97	TSS	4	IA	mg/L	P323936	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P323538	
1888715	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P323350	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31	I	mg N/L	P323502	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323573	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P323509	
	SM 5310 B-00	Organic Carbon	2.5		mg C/L	P323471	
1888719	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P323341	
1888733	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P323748	
	EPA 200.8 Rev. 5.4	Arsenic	2.03		ug/L	P323748	
		Cadmium	0.080	U	ug/L	P323748	
		Chromium	1.6	U	ug/L	P323748	
		Copper	0.80	U	ug/L	P323748	
		Lead	0.20	U	ug/L	P323748	
		Nickel	0.80	U	ug/L	P323748	
		Silver	0.040	U	ug/L	P323748	
		Zinc	4.6	I	ug/L	P323748	

Ref. Method and Comment:
EPA 180.1 Rev. 2.0: The sample expired upon receipt.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

Sample Location: 8073 #1 SOUTH OF FT. ZACH **Collection Date/Time: 04/11/2017 12:20**

Field ID: G5SD041217-1 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888712	EPA 180.1 Rev. 2.0	Turbidity	1.2	Q	NTU	P323528	
	SM 2320 B-97	Total Alkalinity	122		mg CaCO3/L	P323536	
	SM 2540 D-97	TSS	4	I	mg/L	P323936	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P323538	
1888716	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P323350	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.23	I	mg N/L	P323502	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323573	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P323509	
	SM 5310 B-00	Organic Carbon	1.9	I	mg C/L	P323471	
1888720	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P323341	
1888734	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P323748	
	EPA 200.8 Rev. 5.4	Arsenic	1.95		ug/L	P323748	
		Cadmium	0.080	U	ug/L	P323748	
		Chromium	1.6	U	ug/L	P323748	
		Copper	0.80	U	ug/L	P323748	
		Lead	0.25	U	ug/L	P323748	

Field ID: G5SD041217-1 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888734	EPA 200.8 Rev. 5.4	Nickel	0.80	U	ug/L	P323748	
		Silver	0.040	U	ug/L	P323748	
		Zinc	4.0	U	ug/L	P323748	

Ref. Method and Comment:
EPA 180.1 Rev. 2.0: The sample expired upon receipt.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

Sample Location: 8073 #2 **Collection Date/Time: 04/11/2017 12:40**

Field ID: G5SD041217-2 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888713	EPA 180.1 Rev. 2.0	Turbidity	1.1	Q	NTU	P323528	
	SM 2320 B-97	Total Alkalinity	122		mg CaCO3/L	P323536	
	SM 2540 D-97	TSS	3	U	mg/L	P323936	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P323538	
1888717	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P323350	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29	I	mg N/L	P323502	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323573	
	EPA 365.1 Rev. 2.0	Total-P	0.006	I	mg P/L	P323509	
	SM 5310 B-00	Organic Carbon	1.9	I	mg C/L	P323471	
1888721	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	IQ	mg P/L	P323341	
1888735	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P323748	
	EPA 200.8 Rev. 5.4	Arsenic	2.01		ug/L	P323748	
		Cadmium	0.080	U	ug/L	P323748	
		Chromium	1.6	U	ug/L	P323748	
		Copper	0.80	U	ug/L	P323748	
		Lead	0.35	U	ug/L	P323748	
		Nickel	0.80	U	ug/L	P323748	
		Silver	0.040	U	ug/L	P323748	
		Zinc	4.0	U	ug/L	P323748	

Ref. Method and Comment:
EPA 180.1 Rev. 2.0: The sample expired upon receipt.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.
EPA 200.8 Rev. 5.4: The sample required dilution for lead due to matrix interference.

Sample Location: 8073- ENG4 W OF KEY WEST #2 **Collection Date/Time: 04/11/2017 13:00**

Field ID: G5SD041217-10 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888714	EPA 180.1 Rev. 2.0	Turbidity	0.70	Q	NTU	P323528	
	SM 2320 B-97	Total Alkalinity	122	A	mg CaCO3/L	P323536	
	SM 2540 D-97	TSS	4	I	mg/L	P323936	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P323538	
1888718	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P323350	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.21	I	mg N/L	P323556	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P323573	

Field ID: G5SD041217-10 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1888718	EPA 365.1 Rev. 2.0	Total-P	0.006	I	mg P/L	P323509	
	SM 5310 B-00	Organic Carbon	1.8	I	mg C/L	P323471	
1888722	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P323341	
1888736	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P323748	
	EPA 200.8 Rev. 5.4	Arsenic	2.03		ug/L	P323748	
		Cadmium	0.080	U	ug/L	P323748	
		Chromium	1.6	U	ug/L	P323748	
		Copper	0.80	U	ug/L	P323748	
		Lead	0.20	U	ug/L	P323748	
		Nickel	0.80	U	ug/L	P323748	
		Silver	0.040	U	ug/L	P323748	
		Zinc	4.0	U	ug/L	P323748	

Ref. Method and Comment:
EPA 180.1 Rev. 2.0: The sample expired upon receipt.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

Non-Conformance Report

NCR ID: 6362

Event(s)	Job(s)	Sample(s)	Test(s)
SO-DIST-2017-04-13-02			

NCR Type: SHIPPING/RECEIVING **NCR Category: Samples arrived late**

Observation: FedEx code: 8117112413

Samples collected on 4-11-2017 earliest collection time is 11:30

Resolution: Biology and Chemistry supervisors were notified by phone and email.

4/18/2017
Customer indicated they wanted the short hold samples to be qualified.

Authorized by/Date: Ramsey K. White 5/5/2017

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry Colin Wright (850) 245-8085
Biology Cheryl Swanson (850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323528

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323748

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323748

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323350

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323502

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323556

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323573

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323509

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323341

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P323536

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

Reference Method: SM 2540 D-97
Batch ID: P323936

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P323538

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P323471

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: P323748

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323748

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	98.0		P	85 - 115
Cadmium	96.0		P	85 - 115
Chromium	96.7		P	85 - 115
Copper	96.8		P	85 - 115
Lead	94.9		P	85 - 115
Nickel	97.5		P	85 - 115
Silver	96.1		P	85 - 115
Zinc	97.2		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323350

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323502

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323556

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323573

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	94.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323509

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323341

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	95.8		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P323536

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

Reference Method: SM 4500 F-C-97
Batch ID: P323538

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P323471

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887121	Iron	102		P	70 - 130
1887254	Iron	94.1	93.5	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1887121	Arsenic	110		P	70 - 130
1887121	Cadmium	99.9		P	70 - 130
1887121	Chromium	94.6		P	70 - 130
1887121	Copper	98.3		P	70 - 130
1887121	Lead	103		P	70 - 130
1887121	Nickel	102		P	70 - 130
1887121	Silver	96.1		P	70 - 130
1887121	Zinc	100		P	70 - 130
1887254	Arsenic	108	107	P/P	70 - 130
1887254	Cadmium	101	101	P/P	70 - 130
1887254	Chromium	91.4	91.1	P/P	70 - 130
1887254	Copper	93.7	93.9	P/P	70 - 130
1887254	Lead	103	103	P/P	70 - 130
1887254	Nickel	99.8	99.2	P/P	70 - 130
1887254	Silver	93.9	94.3	P/P	70 - 130
1887254	Zinc	94.8	92.6	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323350

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888715	Ammonia-N	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323502

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888640	Kjeldahl Nitrogen	95.2	96.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323556

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888718	Kjeldahl Nitrogen	96.7	90.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323573

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888644	NO2NO3-N	97.0	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323509

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323509

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888642	Total-P	99.2	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323341

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888722	O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P323538

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888714	Fluoride	93.5	95.0	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P323471

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1888091	Organic Carbon	99.9	102	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P323528

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888703	Turbidity	6.23	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P323748

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887254	Iron	0.612	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P323748

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1887254	Arsenic	0.373	Spike	P	0 - 20
1887254	Cadmium	0.600	Spike	P	0 - 20
1887254	Chromium	0.363	Spike	P	0 - 20
1887254	Copper	0.185	Spike	P	0 - 20
1887254	Lead	0.141	Spike	P	0 - 20
1887254	Nickel	0.590	Spike	P	0 - 20
1887254	Silver	0.400	Spike	P	0 - 20
1887254	Zinc	1.73	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P323350

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888715	Ammonia-N	1.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323502

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888640	Kjeldahl Nitrogen	1.37	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P323556

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888718	Kjeldahl Nitrogen	6.18	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P323573

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888644	NO2NO3-N	0.514	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P323509

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888642	Total-P	0.227	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P323341

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888722	O-Phosphate-P	0.896	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P323536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888714	Total Alkalinity	0.0136	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P323538

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888714	Fluoride	0.934	Spike	P	0 - 3.0

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P323471

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1888091	Organic Carbon	1.35	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: A75771
Included Lab Sample IDs: 1888719, 1888720, 1888721, 1888722

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.7	98.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A75772
Included Lab Sample IDs: 1888715, 1888716, 1888717, 1888718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	103	P/P	90 - 110
Ammonia-N	103	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A75802
Included Lab Sample IDs: 1888715, 1888716, 1888717, 1888718

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A75831
Included Lab Sample IDs: 1888711, 1888712, 1888713, 1888714

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

Reference Method: SM 2320 B-97
Run ID: A75833
Included Lab Sample IDs: 1888711, 1888712, 1888713, 1888714

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

Reference Method: SM 4500 F-C-97
Run ID: A75833
Included Lab Sample IDs: 1888711, 1888712, 1888713, 1888714

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.9	97.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A75833
Included Lab Sample IDs: 1888711, 1888712, 1888713, 1888714

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	97.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A75838
Included Lab Sample IDs: 1888715, 1888716, 1888717, 1888718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	94.5	94.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A75853
Included Lab Sample IDs: 1888715, 1888716, 1888717

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.6	98.5	P/P	90 - 110
Kjeldahl Nitrogen	97.0	94.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A75872
Included Lab Sample IDs: 1888718

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A75873
Included Lab Sample IDs: 1888715, 1888716, 1888717, 1888718

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A75972
Included Lab Sample IDs: 1888733, 1888734, 1888735, 1888736

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	94.9	93.8	P/P	90 - 110
Arsenic	96.7	94.9	P/P	90 - 110
Cadmium	96.5	97.0	P/P	90 - 110
Cadmium	97.0	95.1	P/P	90 - 110
Chromium	97.6	95.3	P/P	90 - 110
Chromium	98.1	97.6	P/P	90 - 110
Copper	92.0	91.0	P/P	90 - 110
Copper	96.4	92.0	P/P	90 - 110
Lead	95.8	94.4	P/P	90 - 110
Lead	97.2	95.8	P/P	90 - 110
Nickel	91.3	90.8	P/P	90 - 110
Nickel	95.2	91.3	P/P	90 - 110
Silver	95.2	94.0	P/P	90 - 110
Silver	96.1	95.2	P/P	90 - 110
Zinc	93.9	92.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A75972
Included Lab Sample IDs: 1888733, 1888734, 1888735, 1888736

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	97.9	93.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A75991
Included Lab Sample IDs: 1888733, 1888734, 1888735, 1888736

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	96.7	95.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A76011
Included Lab Sample IDs: 1888734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	95.2	93.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A76097
Included Lab Sample IDs: 1888735

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	95.0	96.2	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		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						6.23	
EPA 200.7 Rev. 4.4	Iron	100	94.1	93.5	102			0.612
EPA 200.8 Rev. 5.4	Arsenic	98.0	110	108	107			0.373
	Cadmium	96.0	99.9	101	101			0.600
	Chromium	96.7	94.6	91.4	91.1			0.363
	Copper	96.8	98.3	93.7	93.9			0.185
	Lead	94.9	103	103	103			0.141
	Nickel	97.5	102	99.8	99.2			0.590
	Silver	96.1	96.1	93.9	94.3			0.400
	Zinc	97.2	100	94.8	92.6			1.73
EPA 350.1 Rev. 2.0	Ammonia-N	102	104	105				1.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.2	95.2	96.7				1.37
	Kjeldahl Nitrogen	97.8	96.7	90.4				6.18
EPA 353.2 Rev. 2.0	NO2NO3-N	94.0	97.0	97.5				0.514
EPA 365.1 Rev. 2.0	Total-P	105	99.2	99.0				0.227
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	95.8	100	101				0.896
SM 2320 B-97	Total Alkalinity	104					0.0136	
SM 4500 F-C-97	Fluoride	94.5	93.5	95.0				0.934

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
SM 5310 B-00	Organic Carbon	105	99.9	102			1.35

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1888711, 1888712, 1888713, 1888714
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1888733, 1888734, 1888735, 1888736
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1888733, 1888734, 1888735, 1888736
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1888715, 1888716, 1888717, 1888718
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1888715, 1888716, 1888717, 1888718
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1888715, 1888716, 1888717, 1888718
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1888715, 1888716, 1888717, 1888718
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1888719, 1888720, 1888721, 1888722
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1888711, 1888712, 1888713, 1888714
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1888711, 1888712, 1888713, 1888714
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1888711, 1888712, 1888713, 1888714
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1888715, 1888716, 1888717, 1888718

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	04/13/2017			04/13/2017 14:59	Sima Feizi	1888711
	04/13/2017			04/13/2017 15:01	Sima Feizi	1888712
	04/13/2017			04/13/2017 15:04	Sima Feizi	1888713
	04/13/2017			04/13/2017 15:09	Sima Feizi	1888714
EPA 200.7 Rev. 4.4	04/13/2017	04/20/2017	Elliott D. Healy	04/25/2017	Martin Acosta	1888733, 1888734, 1888735, 1888736
EPA 200.8 Rev. 5.4	04/13/2017	04/20/2017	Elliott D. Healy	04/24/2017	Betina Topolski	1888733, 1888734, 1888735, 1888736
	04/13/2017	04/20/2017	Elliott D. Healy	04/26/2017	Betina Topolski	1888734
	04/13/2017	04/20/2017	Elliott D. Healy	05/01/2017	Betina Topolski	1888735
EPA 350.1 Rev. 2.0	04/13/2017			04/13/2017	Julie Michelle Frank	1888715, 1888716, 1888717, 1888718
EPA 351.2 Rev. 2.0	04/13/2017	04/17/2017	Adrian Shelby	04/18/2017	Joseph Suarez	1888715, 1888716, 1888717
	04/13/2017	04/18/2017	Adrian Shelby	04/19/2017	Joseph Suarez	1888718
EPA 353.2 Rev. 2.0	04/13/2017			04/18/2017	Beverly Y. Sanders	1888715, 1888716, 1888717, 1888718
EPA 365.1 Rev. 2.0	04/13/2017	04/17/2017	Vijayalakshmi Reddy	04/19/2017	Lipi Saha	1888715, 1888716, 1888717, 1888718
EPA 365.1 Rev. 2.0 dissolved	04/13/2017			04/13/2017 13:10	Anthony C. Onicha	1888722
	04/13/2017			04/13/2017 13:13	Anthony C. Onicha	1888719
	04/13/2017			04/13/2017 13:14	Anthony C. Onicha	1888720, 1888721
SM 2320 B-97	04/13/2017			04/17/2017	Dale L. Simmons	1888711, 1888712, 1888713, 1888714
SM 2540 D-97	04/13/2017			04/17/2017	Sima Feizi	1888711, 1888712, 1888713, 1888714
SM 4500 F-C-97	04/13/2017			04/17/2017	Dale L. Simmons	1888711, 1888712, 1888713, 1888714
SM 5310 B-00	04/13/2017			04/14/2017	Julie Michelle Frank	1888715, 1888716, 1888717, 1888718