Chemical Analysis Report

SO-DIST-2018-05-17-02

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

Event Description: **GOM : 8065, 8063, 3278U x 2**
Request ID: **RQ-2018-04-30-77**
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 33901-3381
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 04-JUN-2018 17:15

B. Steinbock

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: 8065-ENRE 6 @ **Collection Date/Time: 05/16/2018 11:00**

Field ID: G1SD0065 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993484	EPA 180.1 Rev. 2.0	Turbidity	15		NTU	P345530	
	SM 2320 B-97	Total Alkalinity	124		mg CaCO3/L	P345706	
	SM 2540 D-97	TSS	16		mg/L	P345810	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P345707	
1993486	EPA 350.1 Rev. 2.0	Ammonia-N	0.061		mg N/L	P345578	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.44		mg N/L	P345820	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P345672	
	EPA 365.1 Rev. 2.0	Total-P	0.074		mg P/L	P345660	
	SM 5310 B-00	Organic Carbon	3.5		mg C/L	P345787	
1993488	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.027		mg P/L	P345528	

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: 8065-ENRE 6 @ blank_16052018 **Collection Date/Time: 05/16/2018 11:05**

Field ID: 8065-ENRE 6 @ blank_16052018 Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993485	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P345530	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P345912	
	SM 2540 D-97	TSS	2	U	mg/L	P345807	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345915	
1993487	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P345850	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P345622	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345736	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P345663	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P346150	
1993489	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P345527	

Sample Location: Rookery Bay-Site 2 **Collection Date/Time: 05/16/2018 11:45**

Field ID: G1SD0068 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993481	EPA 180.1 Rev. 2.0	Turbidity	13		NTU	P345530	
	SM 2320 B-97	Total Alkalinity	127		mg CaCO3/L	P345706	
	SM 2540 D-97	TSS	13		mg/L	P345810	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P345707	
1993482	EPA 350.1 Rev. 2.0	Ammonia-N	0.074		mg N/L	P345578	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P345820	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P345672	
	EPA 365.1 Rev. 2.0	Total-P	0.084		mg P/L	P345660	
	SM 5310 B-00	Organic Carbon	4.2		mg C/L	P345787	
1993483	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.038		mg P/L	P345528	
1993496	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P345788	
	EPA 200.8 Rev. 5.4	Arsenic	4.19		ug/L	P345788	

Field ID: G1SD0068 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1993496	EPA 200.8 Rev. 5.4	Cadmium	0.20	U	ug/L	P345788	
		Chromium	1.6	U	ug/L	P345788	
		Copper	0.80	U	ug/L	P345788	
		Lead	0.50	U	ug/L	P345788	
		Nickel	0.80	U	ug/L	P345788	
		Silver	0.10	U	ug/L	P345788	
		Zinc	4.0	U	ug/L	P345788	

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: P345530

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345788

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345788

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: P345578

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345850

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345622

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345622

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345820

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345672

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345736

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345660

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345663

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345527

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345528

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

Reference Method: SM 2320 B-97
Batch ID: P345706

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P345912

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

Reference Method: SM 2540 D-97
Batch ID: P345807

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345810

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P345707

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P345915

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P345787

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

Reference Method: SM 5310 B-00
Batch ID: P346150

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: P345788

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	108		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345788

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345788

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	99.7		P	85 - 115
Copper	98.7		P	85 - 115
Lead	98.0		P	85 - 115
Nickel	101		P	85 - 115
Silver	102		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345578

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345850

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345622

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	108		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345820

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345672

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345736

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345660

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345663

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345527

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345528

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.5		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P345706

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P345912

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P345707

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	93.3		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P345915

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

Reference Method: SM 5310 B-00
Batch ID: P345787

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.8		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P346150

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.7		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345788

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993496	Iron	103	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345788

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993496	Arsenic	109	108	P/P	70 - 130
1993496	Cadmium	87.2	91.5	P/P	70 - 130
1993496	Chromium	92.7	92.4	P/P	70 - 130
1993496	Copper	110	110	P/P	70 - 130
1993496	Lead	106	108	P/P	70 - 130
1993496	Nickel	119	120	P/P	70 - 130
1993496	Silver	93.8	94.2	P/P	70 - 130
1993496	Zinc	88.5	88.7	P/P	70 - 130

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345578

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993120	Ammonia-N	102	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993366	Ammonia-N	98.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345622

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993365	Kjeldahl Nitrogen	101	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345820

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993105	Kjeldahl Nitrogen	94.2	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345672

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993482	NO2NO3-N	98.7	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345736

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993450	NO2NO3-N	100	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345660

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993104	Total-P	90.1	92.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345663

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993801	Total-P	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345527

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993429	O-Phosphate-P	97.6	95.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345528

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993483	O-Phosphate-P	97.4	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P345707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993060	Fluoride	92.7	92.0	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P345915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993351	Fluoride	94.7	94.1	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345787

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992441	Organic Carbon	97.0	97.9	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P346150

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1993933	Organic Carbon	96.3	96.4	P/P	85 - 115

Quality Assurance Report
Precision

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P345530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993427	Turbidity	4.39	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345788

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993496	Iron	1.49	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345788

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993496	Arsenic	0.482	Spike	P	0 - 20
1993496	Cadmium	4.80	Spike	P	0 - 20
1993496	Chromium	0.295	Spike	P	0 - 20
1993496	Copper	0.448	Spike	P	0 - 20
1993496	Lead	1.82	Spike	P	0 - 20
1993496	Nickel	1.18	Spike	P	0 - 20
1993496	Silver	0.438	Spike	P	0 - 20
1993496	Zinc	0.281	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993120	Ammonia-N	2.65	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993366	Ammonia-N	1.41	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345622

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993365	Kjeldahl Nitrogen	3.96	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345820

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993105	Kjeldahl Nitrogen	6.04	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345672

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993482	NO2NO3-N	0.484	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993450	NO2NO3-N	0.738	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345660

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993104	Total-P	2.60	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345663

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993801	Total-P	1.14	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993429	O-Phosphate-P	1.44	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345528

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993483	O-Phosphate-P	0.883	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P345706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993060	Total Alkalinity	0.616	Sample	P	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P345912

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993351	Total Alkalinity	0.289	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2540 D-97
Batch ID: P345807

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993456	TSS	0.0	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P345707

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993060	Fluoride	0.476	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P345915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993351	Fluoride	0.474	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P345787

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992441	Organic Carbon	0.694	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P346150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993933	Organic Carbon	0.0994	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: A83983
Included Lab Sample IDs: 1993483, 1993488, 1993489

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	99.3	P/P	90 - 110
O-Phosphate-P	98.9	98.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83984
Included Lab Sample IDs: 1993481, 1993484, 1993485

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A84014
Included Lab Sample IDs: 1993482, 1993486

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A84050
Included Lab Sample IDs: 1993482, 1993486

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	97.0	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A84069
Included Lab Sample IDs: 1993481, 1993484

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A84069
Included Lab Sample IDs: 1993481, 1993484

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.6	95.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A84080
Included Lab Sample IDs: 1993487

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A84099
Included Lab Sample IDs: 1993482, 1993486

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A84116
Included Lab Sample IDs: 1993487

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	99.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A84126
Included Lab Sample IDs: 1993487

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84134
Included Lab Sample IDs: 1993482, 1993486, 1993487

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	101	P/P	90 - 110
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A84135
Included Lab Sample IDs: 1993482, 1993486

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.7	98.0	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A84146
Included Lab Sample IDs: 1993485

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A84146
Included Lab Sample IDs: 1993485

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A84148
Included Lab Sample IDs: 1993496

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	102	P/P	90 - 110
Cadmium	98.4	98.5	P/P	90 - 110
Chromium	98.1	97.9	P/P	90 - 110
Copper	102	102	P/P	90 - 110
Lead	99.0	98.7	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Silver	100	100	P/P	90 - 110
Zinc	102	102	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A84243
Included Lab Sample IDs: 1993487

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	98.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A84267
Included Lab Sample IDs: 1993496

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	100	101	P/P	95 - 105

Quality Assurance Report
Calibration Verification

* 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					4.39	
EPA 200.7 Rev. 4.4	Iron	108	103	104			1.49
EPA 200.8 Rev. 5.4	Arsenic	102	109	108			0.482
	Cadmium	101	87.2	91.5			4.80
	Chromium	99.7	92.7	92.4			0.295
	Copper	98.7	110	110			0.448
	Lead	98.0	106	108			1.82
	Nickel	101	119	120			1.18
	Silver	102	93.8	94.2			0.438
	Zinc	103	88.7	88.5			0.281
EPA 350.1 Rev. 2.0	Ammonia-N	105	102	106			2.65
	Ammonia-N	99.7	98.8	100			1.41
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	101	105			3.96
	Kjeldahl Nitrogen	96.0	94.2	101			6.04
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	98.7	99.2			0.484
	NO2NO3-N	101	100	101			0.738
EPA 365.1 Rev. 2.0	Total-P	98.2	90.1	92.6			2.60
	Total-P	101	101	100			1.14
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	97.6	95.7			1.44
	O-Phosphate-P	98.5	97.4	98.6			0.883
SM 2320 B-97	Total Alkalinity	102				0.616	
	Total Alkalinity	102				0.289	
SM 2540 D-97	TSS					0.0	
SM 4500 F-C-97	Fluoride	93.3	92.7	92.0			0.476
	Fluoride	95.9	94.7	94.1			0.474
SM 5310 B-00	Organic Carbon	98.8	97.0	97.9			0.694
	Organic Carbon	94.7	96.3	96.4			0.0994

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1993481, 1993484, 1993485
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1993496
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1993496
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1993482, 1993486, 1993487
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1993482, 1993486, 1993487
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1993482, 1993486, 1993487
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1993482, 1993486, 1993487
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1993483, 1993488, 1993489

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1993481, 1993484, 1993485
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	1993481, 1993484, 1993485
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1993481, 1993484, 1993485
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1993482, 1993486, 1993487

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	05/17/2018			05/17/2018 17:09	William L. Brown IV	1993481, 1993484, 1993485
EPA 200.7 Rev. 4.4	05/17/2018	05/23/2018 14:33	Allison Taylor	05/25/2018 14:27	Martin Acosta	1993496
EPA 200.8 Rev. 5.4	05/17/2018	05/23/2018 14:33	Allison Taylor	05/24/2018 21:37	Nadine Brooks	1993496
	05/17/2018	05/23/2018 14:33	Allison Taylor	05/24/2018 23:03	Nadine Brooks	1993496
EPA 350.1 Rev. 2.0	05/17/2018			05/18/2018 14:37	Julia Storbeck	1993482
	05/17/2018			05/18/2018 14:38	Julia Storbeck	1993486
	05/17/2018			05/22/2018 11:12	Ping Hua	1993487
EPA 351.2 Rev. 2.0	05/17/2018	05/21/2018 12:00	Tanya Welborn	05/23/2018 15:54	Joseph Suarez	1993487
	05/17/2018	05/23/2018 16:00	Adrian Shelby	05/24/2018 11:18	Joseph Suarez	1993482
	05/17/2018	05/23/2018 16:00	Adrian Shelby	05/24/2018 11:19	Joseph Suarez	1993486
EPA 353.2 Rev. 2.0	05/17/2018			05/21/2018 12:33	Lauren Bottorf	1993482
	05/17/2018			05/21/2018 12:42	Lauren Bottorf	1993486
	05/17/2018			05/22/2018 12:15	Lauren Bottorf	1993487
EPA 365.1 Rev. 2.0	05/17/2018	05/21/2018 13:05	Sima Feizi	05/24/2018 09:16	Beverly Y. Sanders	1993482
	05/17/2018	05/21/2018 13:05	Sima Feizi	05/24/2018 09:17	Beverly Y. Sanders	1993486
	05/17/2018	05/21/2018 13:05	Sima Feizi	05/24/2018 09:34	Beverly Y. Sanders	1993487
EPA 365.1 Rev. 2.0 dissolved	05/17/2018			05/17/2018 15:39	Megan Treadwell	1993483
	05/17/2018			05/17/2018 16:03	Megan Treadwell	1993488
	05/17/2018			05/17/2018 16:04	Megan Treadwell	1993489
SM 2320 B-97	05/17/2018			05/21/2018 18:53	Dale L. Simmons	1993481
	05/17/2018			05/21/2018 19:02	Dale L. Simmons	1993484
	05/17/2018			05/24/2018 02:14	Dale L. Simmons	1993485
SM 2540 D-97	05/17/2018			05/18/2018 16:00	William L. Brown IV	1993481, 1993484, 1993485
SM 4500 F-C-97	05/17/2018			05/21/2018 17:02	Dale L. Simmons	1993481
	05/17/2018			05/21/2018 17:06	Dale L. Simmons	1993484
	05/17/2018			05/24/2018 02:14	Dale L. Simmons	1993485
SM 5310 B-00	05/17/2018			05/22/2018 07:56	Megan Treadwell	1993482
	05/17/2018			05/22/2018 08:21	Megan Treadwell	1993486
	05/17/2018			05/29/2018 16:57	Megan Treadwell	1993487